STRENGTHENING THE INTERCULTURAL COMMUNICATIVE COMPETENCE OF INTERNATIONAL UNDERGRADUATE ENGINEERING STUDENTS FOR CO-OP WORK TERM PLACEMENT

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Abstract

Co-op programs pose unique challenges for international students without a strong command of the English language and sufficient familiarity with the professional context. This research investigates the challenges faced by international students enrolled at Memorial University in the Bachelor of Engineering co-op program, and the efforts of the faculty (FEAS) in addressing these students' needs. With a rise in popularity of co-op programs in Canada and a projected steady growth in foreign enrolment, it is crucial to understand better how this cohort's ability to communicate in professional settings impacts their mandatory co-op employment.

The following study was designed as a qualitative case study. It includes 18 semi-structured interviews with FEAS international undergraduate students, key informants from FEAS and the university, and representatives from the engineering industry directly involved with work term placements. In discussing the findings, I draw on the conceptual framework of communicative competence (Hymes, 1972) and examine employers' language expectations through the lenses of the Common European Framework of Reference for Languages (CEFR) and the Canadian Language Benchmarks (CLB), as internationally accredited scales of English language proficiency currently in use in Canada. I rely on these two frameworks to discuss implications for practice and formulate possible directions for future research.

The study indicates that significant differences in the quality of communication (Spitzberg, 1989) among FEAS international students reflect in large disparities in recruitment rate and in long-term career prospects. Findings revealed that certain

behaviours and levels of communication are required for successful hiring and placement. Given the high stakes of work terms, international students' language ability (Bachman, 2010) and intercultural competence (Deardorff, 2011) need to be evaluated specifically against co-op program requirements. Furthermore, as current pedagogical practices are not always effective, alternative approaches are needed that promote greater transparency, consistency and continuity of learning and progress from enrolment to graduation. Program mandated co-op employment of international engineering students is still an under-researched area which, as this research shows, warrants greater interdisciplinary attention. This dissertation represents a first step in that direction.

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In loving memory of my mother, Rina Fabretto, and of Jimmy

"E quindi uscimmo a riveder le stelle" (*Inferno,* XXXIV, 139)

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Introduction

1.1 Background of the study

Recent years have seen the growth of Co-operative Programs in Faculties of Engineering across Canada. Of the 281 Bachelor of Engineering Programs currently offered by the 43 accredited Faculties nationwide (www.engineerscanada.ca), 93 are co-op programs (CAFCE, 2013a, 2013b, 2015). The mission of these programs is to equip undergraduate engineering students with some direct experience in the professional world they expect to enter after graduation. Through work terms, co-op programs provide an opportunity for students to apply the technical know-how acquired in class to real life problems. Perhaps more importantly, these programs aim at familiarizing learners with the practices, norms, and rules of the engineering professional community. They facilitate the acquisition and development of relevant professional skills– commonly referred to as soft skills in other fields– necessary to function successfully in the workplace. Increasingly, professional skills developed during the work term have become instrumental for students' post-graduate employment. A growing body of research in engineering reports employers calling upon faculties to produce graduates that are professionally ready to enter the industry immediately after graduation (Colby & Sullivan, 2008; Sheppard, Macatangay, Colby, & Sullivan, 2008).

If what drives high school graduates to enroll in engineering co-op programs is the prospect of a smoother and faster transition to permanent employment after graduation, research shows the outcome is positive. As Schuurman, Pangborn, and McClintic (2005, 2008) argue, engineering undergraduates' work-term experience has a considerable positive effect on graduates' likelihood of receiving a job offer prior to graduation and a

considerable increase in starting salary. Specifically, results from their studies indicate that the number of work experiences is positively correlated with early career success, making work-term placement an important way to maximise students' employability. Completing several work terms, in different roles at increasing degree of seniority, makes it possible for the student to reach graduation with a sufficiently strong and diversified knowledge repertoire to compete for graduate employment. Other studies have confirmed this (Pinelli & Hall, 2012; Pons, 2012), which accounts for the proliferation of co-op engineering programs in Canada, North America, and around the world (Colby & Sullivan, 2009).

My research is situated in the co-op only program offered by the Faculty of Engineering and Applied Science (FEAS) at Memorial University. The offering of a co-op only program is a decision only some engineering faculties make. For example, the largest co-op program in the country, at the engineering school of the University of Waterloo, is a co-op only. Conversely, for instance, the engineering program at McMaster University makes co-op available as an option to students wanting to enhance their academic degree by adding the co-op designation. Co-op only programs are designed as a completely integrated pattern of academic study and applied experience (Co-operative Education Office, 2016) and graduation requires satisfactory performance in both areas. As a faculty, FEAS is currently midway through its 8-year strategic growth plan entitled "Vision 2020" (FEAS, 2016). With a total of 1265 undergraduate students enrolled in 2016 (p. 20), the target of reaching the yearly goal of 250 graduates from the current 170 by 2021 is on schedule. Currently, international students represent approximately 10% of FEAS undergraduate student body. However, considering enrolment demographic trends

recorded at university level, international recruitment is projected to steadily increase in the future.

1.2 Purpose of the Study

Ensuring that academic and professional success is attainable for the steadily growing and increasingly diverse student population at FEAS is a challenge I consider worth investigating, particularly at this crucial time of program expansion. How the faculty responds to the needs and aspirations of its students is always an intriguing question to ask. Seeking to answer this in the context of a program such as the FEAS can be particularly compelling for several reasons. First, as a fully accredited engineering program, FEAS is subjected to the regulations imposed by the Canadian Engineering Accreditation Board (CEAB). Accordingly, program improvements are expected, provided the criteria established by CEAB are met (CEAB, 2014). Likewise, as co-operative education practitioner, FEAS undergoes quality reviews from the Canadian Association for Co-operative Education (CAFCE, 2013a; 2013b; 2015). Then, since its inception, the field of engineering has made improvement its core and innovation its guiding principle. Thus, while as a sector, engineering is constantly expanding, it is also very competitive. With graduation requiring completion of both the academic and the professional component, success for FEAS students is uniquely contingent upon the faculty responding to student needs for co-op placement. Changes in student population can only exacerbate this challenge.

Considering the above, this research looks at the professional skills relevant to employment in the engineering sector in the context of undergraduate co-op programs. However, unlike the body of research indicated above in which professional skills are

addressed as an outcome of a successful co-op program, I consider them as a prerequisite for it. My review of the literature suggests there is a lack of research involving professional skills as either an advantage or a barrier to sector-specific employment prior to graduation – as it would be for co-op employment. Yet, considering the mandatory nature of work terms as an integral component of co-op only programs, challenges and opportunities associated with students' professional skills warrant attention and research. Accordingly, among the set of key professional skills as employability skills (The Conference Board of Canada, 2012), I focus my attention on communication, as the one that researchers and employers regard as a core requirement of the engineering profession (McMasters & Komerath, 2005; McMasters, 2006; NAE, 2004, 2005, 2013; Somashekar 2009). Lastly, with current and projected trends in demographics in mind, for FEAS as well as nationwide, I further narrow my scope to investigate how communication relates to co-op placements when the student candidate is international.

International students have occupied researchers worldwide for over a century (University of Cambridge, 2017). But it is in response to the seemingly unstoppable rise in global student mobility of the last few decades that research burgeoned, shaping the landscape of postsecondary education. It was established that most international students struggle, in some way and to some extent, to function and integrate in their new host-country and to succeed in their academic program (Anant, 2010; Molinsky, 2007, 2010; Vinay, 2009). Also, unlike what Lysgaard (1955) described as a 'honeymoon stage', their arrival is often characterised by high levels of stress and culture shock (Hotta & Ting-Toomey, 2013; Zhou, Jindal-Snape, Topping, & Todman, 2008). Thus, as Berman and Cheng (2010) argue, their struggle is more evident during their first academic year and

particularly among non-native speakers. Insufficient language ability, but also unfamiliarity with a teaching and learning tradition, give rise to what researchers termed "learning shock", which afflicts learners at psychological, cognitive, and affective level (Gu & Maley, 2008; Gu, Schweisfurth, & Day, 2010; Yeh & Inose, 2003). Per Guo and Chase (2011) our knowledge of how international students adapt to the Canadian academic environment, substantially different from their own, remains poor.

Strengthening one's understanding of the dynamics of internationalisation in Higher Education has progressively become the objective of postsecondary institutions worldwide (Spencer-Oatey & Dauber, 2015; Crose, 2011; Harman, 2005; Knight, 2012; Deardorff & Van Gaalen, 2012). This includes Canada (Anderson, 2015; Gopal & Zha, 2015; S. Guo & Chase, 2011; Y. Guo & Guo, 2017; Ilieva, Beck, & Waterstone, 2014). Put simply, universities have come to realise that if they want to profit from diversity they must solve the problems generated by diversity (Fortuijn, 2002). International students are an important source of revenue to host universities (Andrade, 2006; Chen, 2008; Cudmore, 2005). Diversity on campus can also benefit domestic students and faculty (Otten, 2003). However, the devising and implementing of solutions aimed at improving international students' overall experience as well as at maximising their access to opportunities during their stay is critical (Ife, 2000; Llanes & Muñoz, 2009). While most research still locates internationalisation almost exclusively within the purview of the institution, some researchers argue for a more capillary approach. For institutions, to be responsive to their international students is to equip them to function effectively in specific contexts relevant to the program they attend (Brown, 2003; Carey, Mannell, & Dunn, 2011; Davies, 2001, 2009; Li, Mobley, & Kelly, 2013).

It can be said that Memorial University marked its turning point on internationalisation with the 2014 release of the 'Internationalization White Paper' (Knutson, Chislett, & Emke, 2014) and the 2015 publication of the Strategic Internationalisation Plan (Memorial University & Office of the Vice-President (Research), 2015). Together with another important report published a few months later by Philpott, Kennedy and Green (2014), the White Paper informs this research by addressing the distribution of support services for international students at Memorial. Interestingly, when examined comparatively, the two reports seem to advocate opposing strategies. The White Paper argues for greater centralization of support services to increase accessibility to students on campus. Conversely, Philpott et al. (2014) calls for a more faculty- oriented approach, indicating that 72.6% of the entire Memorial undergraduate international student population is hosted in 3 faculties: Engineering, Science, and Business (p. 10). When enrolment is so skewed toward few faculties, Philpott et al. (2014) argue, a "centralized model of support cannot work" (p.25). Moreover, 43.6 % of international students are in programs that require co-op placement (p.10) and significant work in lab environments. Accordingly, students' development of professional practice language, including résumé writing and interview skills, but also lab language relevant to lab safety becomes essential, making the need for faculty- and discipline-specific support unarguable.

1.3 Rationale of the Study

I reached the decision to study communication from the standpoint of international engineering co-op students before the publication of the White Paper and Philpott et. al. (2014). Prompted by anecdotal information circulating within the university community,

in 2012 I conducted a small pilot study (Fabretto, 2013). I intended to probe the claim that international engineering students were struggling and failing in their attempts to secure work terms because of poor soft skills, especially communication. For that project, I opted for a unilateral approach, eliciting only the feedback of international students. Indeed, participants confirmed not only that the problem existed but that it was quite widespread, even among students not limited by poor English ability and some domestic students. Overall, the picture that emerged was one of frustration towards the faculty's handling of the problem, and of confusion regarding the relevance of soft skills to work terms. Notably, in 2012 the faculty still offered an elective course in workplace soft skills dedicated to and tailored on the specific needs of its international cohort. The following year, that course was discontinued due to poor attendance and low enrolment (Philpott et al. p.26). No similar initiative followed.

The review of grey literature produced by FEAS I conducted for this research confirms that no special consideration or attention is granted to students based on language, culture, or country of origin (Co-operative Education Office, 2016). Any FEAS undergraduate student is a "maturing prospective engineer" (p.1, p. 11). The term international student is used exclusively in terms of work visa and the few employer-enforced requirements related to security clearance restricting job access to Canadian citizens (p.11). In other words, despite heterogeneity, FEAS efforts rest on a premise of homogeneity. This, however, is not indicative of a lack of awareness of the differences that may exist between the needs of domestic and international students. Instead, it reflects the decision of the faculty to emphasise that all students entering the program begin a common path to the profession in which they will be evaluated as mature

graduates, not as international ones. It also reflects the commitment of the faculty to close the gap between school and industry as one of the ongoing challenges faculties worldwide are called to face (e.g. Akram, Selvakumar, Lohith, Shambhavi, & Indiramma, 2015; Creed & Hughes, 2013; Kar, 2011; Nungesser, 2002).

By providing both cohorts with the same support in facing work terms, the faculty intends to put students in the position of resolving challenges that are uniquely their own. It chooses not to regard international students as inherently more vulnerable, and domestic ones as inevitably strong. One can argue that international students are uniquely vulnerable (Eyre, 2011; Javidan, Teagarden, & Bowen, 2010). For them, being competitive can be a daunting prospect in a unfamiliar professional context, in a foreign country (Anant, 2010; Molinsky, 2007, 2010; Munley, 2011; Vinay, 2009) using a foreign language (Banerjee, 2009; Mishra, 2009; Rajini, 2009; Vandermeeren, 2005). By disregarding this, the faculty could be viewed as ignoring the needs of this cohort and failing the expectations it had entering the program. Students start a program with a reasonable expectation to complete it because they believe themselves to be adequately equipped for the task ahead (Stappenbelt, 2006; Stappenbelt & Barrett-Lennard, 2007, 2008). When applying, FEAS students include proof of meeting pan-university language requirements (e.g. TOEFL, IELTS etc.) since FEAS does not enforce its own. Improving fluency and effectiveness in communication so that professional competence is reached and co-op success ensues is viewed as resulting from the program learning process.

1.4 Research Objectives

Clarifying what exactly FEAS international students need to learn to succeed in work terms and investigating how they are expected to learn it is the main objective of

this research. To that end, I designed this research as a single embedded exploratory case study (Yin, 2009). As Yin (2009) defines it, a case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clear. I chose a single case design, with communication for work term placement as the unit of analysis (i.e. embedded unit). Alternatively, the multiple case design, in which each participant/group would have represented a case (Yin, 2009, p. 54) would have significantly diverted attention away from the main subject. Lastly, I chose an exploratory case study because I concluded that the knowledge base of my topic is poor and the literature provides no suitable conceptual framework or hypothesis of note (Yin, 2009).

Two additional important considerations supported the choice of the case study design over other, perhaps more commonly adopted, methods. First, privacy constraints and overall accessibility issues would have prevented me from conducting an ethnographic study (Hymes, 1972). It would have been impossible for me to directly observe students communicating during companies' recruitment and selection or at work. Second, virtually all faculties in Canada face similar complex problematics associated with the increased diversity the co-op engineering student population. However, in their pursuit of effective strategies they devise and implement solutions that differ considerably from one another. For example, while FEAS students start competing for work terms immediately after the first year (Engineering One), international students in similar programs are advised to delay competition further. For example, the Vantage Engineering Department at UBC in Vancouver offers international students a tailored first year, which runs parallel to the traditional one (Potvin, private conversation, Halifax, June 26, 2016).

In using a case study, I consider how this research may inform professional communication pedagogy in similarly organised programs in Canada and abroad.

To investigate why some international students succeed, while others fail, is to explore what recruiters and employers expect of them. Accordingly, investigating where most students struggle, and some stumble, identifies gaps and deficiencies in their preparation that the program has either overlooked, or has been unable to solve. However, when tailored support is not provided, asking why they struggle is not merely a question of insufficient support. It may be a problem of overreliance on the effectiveness of the pedagogical strategies put into place for the specific purpose of preparing students to communicate in an engineering setting. It may also be symptomatic of misplaced trust in the reliability of language admission tests (e.g. TOEFL, IELTS) tasked with screening students before admitting them into the program. Considering this, as well as other factors discussed to this point, this research seeks to answer four questions.

1.5 Research Questions

By investigating success, the first two questions aim to uncover the true impact that poor communication has on a student securing a work term and completing it. Whether communication is a factor in the type of placement for which students are hired is also contemplated. The third question seeks to reveal the recruiter and employer's expectations, bringing to light potential gaps and deficiencies in students' preparation. Lastly, a more practical question worth asking is how can the language and intercultural needs of the students be accommodated within existing resources, inescapable constraints, but also established pedagogical traditions. The four questions are as follows:

- To what degree do English ability and Intercultural Competence affect the success of international engineering students in co-op work placements?
- What constitutes adequate versus inadequate competence in communication in the context of work-term placement?
- Do current formal and informal teaching practices and initiatives at the university and the faculty level address the needs of international engineering co-op students?
- What changes must be implemented at a faculty, staff, or curriculum level to ensure that sufficient support is provided to international engineering students?

To answer these questions, I conducted 18 semi-structured interviews. On campus, I interviewed international engineering students and key informants from the faculty and the university. Off campus, I interviewed co-op recruiters and supervisors, representing the engineering industry. Data collected from the interviews have been coded using Constant Comparison Analysis (Glaser & Strauss, 1967). Specifically, inductive analysis has been conducted on the data, to reduce possible bias/ interferences generated by "prior assumptions, theories, or hypotheses identified or constructed by an investigator" (Thomas, 2006, p. 238). The analysis yielded three main themes, intended as patterns of concern, on which I center my discussion. As patterns identified as both recurring and co-occurring in the data, each theme relates to one key aspect of the central problem and significantly contributes to its understanding.

The first theme points at a significant lack of clarity and direction surrounding how students are introduced to the concept of communication for co-op placement and to its critical role in work term placement. Arising from this is a widespread apprehension among students toward the placement process and uncertainty about how to best prepare

for it. The second theme emphasises the need for greater structure in the way communication is approached at faculty level. The way in which recruiters and employers' expectations are currently addressed is unsystematic and devoid of necessary details required for the satisfactory development of competence. The third and last theme concerns the ineffectiveness of competence building pedagogical practices currently employed at FEAS. Exacerbated by the increase in diversity within the student population, these practices are, in some cases, counterproductive, leading to consequences opposed to those initially intended.

1.6 Operational definitions

I discuss each theme by drawing on the conceptual framework of 'communicative competence' as developed in 1980 by Canale and Swain, and further developed by Bachman (1990), Celce-Murcia et al. (1995), and Bachman and Palmer (2010). I use the framework to emphasise the multidimensional nature of communication and emphasise its importance in the development of competence in a foreign language. I rely on the theoretical framework of the Canadian Language Benchmarks (CLB) (2015c) and that of the Common European Framework of Reference for Languages (CEFR) (2001) to view recruiters and employers' language expectations as language tasks the student needs to master. Both CLB and CEFR are internationally accredited scales of English language proficiency currently in use in Canada (Council of Ministers of Education Canada, 2010; Macdonald & Vandergrift, 2007; Vandergrift, 2015). They aid in establishing 'how well' the student can perform each language task through *Can Do* descriptors (see Appendix A). Importantly, both introduce the concepts of familiarity with the context and complexity of the task to explain learner's competence development and progress. I chose

them in my research because of their strong theoretical underpinning and because they meet the requirements for rigor, structure and versatility dictated by the project.

This research was also designed to investigate the impact of international students' poor intercultural competence on co-op employment. Initially, I intended to centre it almost exclusively on the framework of Intercultural Communicative Competence (ICC), as formulated by Byram (1997). However, during data collection, I concluded that a balance had to be struck between the intercultural competence of the international students using a foreign language (Byram, 1997) and that of the people in the learning and working environments in which they are expected to function. Accordingly, while I consider Byram's term and framework, I rely on the frameworks presented by Deardorff (2004, 2006, 2009, 2011), by Deardorff and Jones (2012) and Deardorff and Van Gaalen (2012). Likewise, I acknowledge Bennett's Developmental Model of Intercultural Sensitivity (1993) to better collocate my research in the context of Memorial University (Philpott et al., 2014). Lastly, to further corroborate my argument, I draw from documents prepared by the Language Policy Unit of the Council of Europe, including the European Language Portfolio, and their founding principles.

1.7 Roadmap of the study

The rest of this dissertation is structured as follows. I begin in Chapter 2 with a discussion of Communicative Competence as the main theoretical perspective that underpins this research. In this section I introduce the central tenets of the communicative approach, summarise the main models that inform this research, and introduce the CLB and the CEFR frameworks on which I will rely to formulate my discussion of this research findings. Next, I turn to discuss Intercultural Competence and Intercultural

Communicative Competence, where I highlight issues related to the learning and assessment in Higher Education. Because my research is situated in the context of an engineering undergraduate program, in the third, and last, section of this chapter I look at Engineering Communication in the professional and academic contexts, with particular emphasis on situated learning in this discipline.

In Chapter 3 I explain the method of inquiry I adopted in this research. Following a brief outline of the qualitative research method, I present the four Research Questions that guided this study. Next, I discuss the case study approach in general and in this research particular, followed by a detailed explanation of the data sources and of the data collection process I used. A section on the ethical considerations that governed my inquiry precedes the explanation of the procedures that I followed for analysing the data. The last section of this chapter discusses the limitations of the qualitative case study research and of this study. I summarise these research findings in Chapter 4. I opted for presenting the main results grouped by source, beginning with engineering international students, followed by representatives from the industry, namely co-op students' recruiters and supervisors, and, lastly, with FEAS co-op coordinators and university staff. In presenting the findings from each group, I introduced sub-headings relevant to my discussion in Chapter 5 and the conclusions and implications that I present in Chapter 6 as signposts for the reader.

Chapter 5 comprises three main sections in which I discuss my findings in relation to the theoretical constructs presented in Chapter 2 and analysed through the lenses of the CLB and CEFR frameworks. In this chapter, I address these frameworks' concept of language task and of student's familiarity with tasks and contexts of use to discuss

discrepancies, gaps, and areas of improvement in students' workplace communication that emerged from my analysis of the data. Next, I provide a sample of work term-relevant language tasks extrapolated from the interview transcripts and modelled on the CLB and CEFR Can Do descriptors as an example of recruiters and employers' expectations of a work term candidate. I highlight potential pitfalls and limits of current FEAS pedagogical practices aimed at the development of professional communication, with particular emphasis on the adoption of situated learning as the main approach.

Chapter 6 concludes this dissertation. I begin this chapter with my conclusions as a way to bridge the discussion I presented in Chapter 5 with the implications for practice and for policy, as well as with the directions for future research that follow. Accordingly, I summarise the key points yielded by this study and briefly outline the argument that forms the basis for the implications I present next. The remainder of this chapter is based on the participants' input and the literature reviewed for this dissertation. Specifically, it reflects the data collected for Research Question 4 that elicits suggestions on ways to improve current practices at FEAS and within the university associated with the preparation of international students for work term placement.

The present case study is to be regarded as a first step towards a better understanding of FEAS international undergraduate students' communication challenges when transitioning from academia to co-op work term placement. As such, findings from this research are expected to inform future directions in research on this topic. Specifically, further research is necessary to better capture the extent and the nuances of the problem on a much larger scale and broader scope at FEAS and in similar co-op

programs in Canada that may be experiencing challenges similar to those central to this dissertation.

Chapter 2

Review of the Literature

In this chapter I introduce the theoretical framework that underlies my analysis in Chapter 5 and 6. I begin by outlining the Communicative Competence construct to second language learning, the perspective espoused in this dissertation. I draw primarily on the works of Canale and Swain (1980), Bachman and Palmer (2010), and Celce-Murcia et al. (1995) to introduce the theoretical framework of the Canadian Language Benchmarks (CLB) (2015c) and of the Common European Framework of Reference for Languages (CEFR) (2001) as viable frameworks of reference on which future improvements in the teaching, learning, and assessment of FEAS international engineering students' language ability for co-op placement may be collocated. Next, I define the concept of Intercultural Competence, building primarily on the works of Deardorff (2004, 2006, 2012), Byram (1997), and Bennett (1997). I dedicate the last section of this chapter to the review of current research on the subject of communication as addressed in the literature on engineering education research and practice.

2.1 Conceptualising Communicative Competence

The investigation into the conceptualisation and operationalisation of language for pedagogical purposes has interested researchers for centuries. But it is in the early 1970s that a more comprehensive conceptualization of language revolutionised the field, when Hymes (1972) published his theory of communicative competence. This revolutionary theory postulates that knowing a language entails a knowledge of the linguistic system (that is, the rules of grammar) as contended by Chomsky (1965), but requires also a knowledge of the rules of language use, intended as the rules of appropriateness to the

context in which language is to be used, without which, the rules of grammar would be "useless" (p. 278). In Hymes' view, the concepts of competence and performance in L2, should no longer relate to the acquisition of idealized abstractions in which language behaviour is ignored (Canale & Swain, 1980), but rather have as a foundation the sociocultural significance and authenticity of the language in use. Hymes' communicative competence, then, is defined as "the capabilities of a person" and "it is dependent upon both [tacit] knowledge and [ability for] use" (Hymes, 1972, p.282).

Competence refers to what a learner knows about a language while proficiency points at what the learner is capable of doing using the language to communicate. Understanding these terms had profound pedagogical implications. With the publication of Canale and Swain's (1980) seminal work on communicative approaches to second language teaching and testing, several theoretical frameworks were proposed to describe the multidimensional nature of language ability and communicative competence. Below I briefly outline the three models that inform this dissertation, namely Canale and Swain (1980), Bachman and Palmer (2010), and Celce-Murcia et al. (1995). I chose these three models because they were used in the design of the CEFR (Council of Europe, 2001) and the CLB (CCLB, 2015c), the two frameworks of reference that underpin my argument.

2.2 Models of Communicative Competence

Canale and Swain (1980) published their position paper aiming to determine the feasibility and practicality of measuring communicative competence so that its principles could be applied to L2 pedagogy. As a result, the authors developed a new set of principles that they deemed to be consistent with a more comprehensive theoretical framework. The subsequent work by Bachman and Palmer (2010) was initially conceived as a construct of

communicative competence in which language assessment is emphasised, however, according to Celce-Murcia et al. (1995) such model building has been carried out with reference to language testing rather than to objectives of language instruction. The model proposed by Celce-Murcia et al. (1995) is perhaps the most pedagogically oriented framework among the three discussed here; it was motivated by the authors' belief in the potential of a direct, explicit approach to the teaching of communicative skills as a content base for syllabus design.

Although the list of components that define the construct of communicative competence vary among the three models, in all three, such components are intended as interacting with each other in a compensatory manner, as encompassing the objectives for foreign language teaching and learning. Canale and Swain (1980) view communicative competence as the interaction between grammatical, sociolinguistic, and strategic components, with the addition of the discourse component later introduced by Canale (1983). Bachman and Palmer (1996, 2010) identify grammatical, textual, functional, sociolinguistic, and strategic components. Celce-Murcia et al. (1995) enlist linguistic, discourse, socio-cultural, strategic, and actional components in their model. Notably, Van Ek (1986) added two components to the list by Canale and Swain (1980). Sociocultural competence, to Van Ek is seen as the ability of an individual to function on several cultural contexts. Social competence, on the other hand, refers to an individual's familiarity with different social norms and customs, as related to the confidence, empathy, and motivation to communicate with a diverse audience. Van Ek's work informs the study in intercultural communicative competence addressed in the next section.

In this dissertation, I rely on the conceptualisation of communicative competence as articulated in two main frameworks of reference for L2 teaching and learning, the Common

European Framework of Reference (CEFR), currently adopted in over 46 countries worldwide and the Canadian Language Benchmark (CLB) adopted in Canada. I reached the decision to include the CEFR in this research for several reasons, including the substantial research that resulted from the Council of Europe's employment of resources. Primarily, however, my decision was informed by the acknowledgement that, although it may not be immediately apparent, the CEFR is gaining prominence in Canada (Council of Ministers of Education Canada, 2010; Macdonald & Vandergrift, 2007; Vandergrift, 2006a, 2006b, 2015). Furthermore, because both frameworks rely on the models of communicative competence mentioned above, both can inform the argument central to this study. Notwithstanding a predominant influence of the Canale and Swain model (1980; Canale, 1983) on the CEFR and of Bachman (1990) and Bachman and Palmer's model (1996, 2010) on the CLB, the commonalities between the two frameworks are substantial, which corroborates the assumption of relevance of both in this research.

However, because this research has been conducted in Canada, where the national standards are those articulated in the CLB, I chose to use the terminology found in the CLB Theoretical Framework (CCLB, 2015c) rather than that used in the CEFR documents (Council of Europe, 2001, 2014b). Accordingly, I will use the term language ability as defined in Bachman and Palmer (2010), and not communicative competence as defined by Canale and Swain (1980), and before them by Hymes (1972). In the CLB, and in this dissertation, language ability is understood as evolving along a hypothetical continuum of scale, along which learner's progress is located and described at 12 specified points (six in CEFR), or Benchmarks (CCLB, 2015b). What the learner is expected to be able to do with the language (i.e. speaking, writing, reading, listening) at each stage of advancement is

captured in Can Do descriptors. Can Do descriptors are succinct statements that explicate the criteria for language use relative to each point along the continuum (CCLB, 2015b).

A learner is considered to be at a given level when that learner has met the criteria stated in a given Can Do descriptor, but has not yet met the criteria represented by the descriptor of the next level. In line with the pedagogical principles of the communicative approach (Hymes, 1972), whereby authenticity is emphasised over the artificiality of linguistic correctness (Widdowson, 1989), language ability is intended as the learner's response to authentic day-to-day communication (as speech events in Hymes, 1972). Thus, in both the CLB and the CEFR, conceptualising the adequacy and fluency in language ability presupposes addressing the concept of initial and developing stages of progress as a function of increasing complexity of language tasks and of context demands.

2.3 Understanding language tasks and progress

With the growth in popularity of the communicative approach, authentic communication gained prominence and task-based instruction became a central tenet of language teaching (Brown, 2007a). Skehan (1998) defines tasks as activities in which meaning is primary, there is a goal to be met, evaluation is outcome-based, and there is a real world relationship. Bachman and Palmer (1996) define a communicative language task as "an activity that involves individuals using language for the purpose of achieving a particular goal or objective in a particular situation" (p. 44). A task, to be coherent with the definition of communicative task must deal with a communication activity or a subject, not with an aspect of grammar (CCLB, 2015c, p. 47). Learners at higher levels of ability are able to accomplish more complex and sophisticated tasks than learners at lower levels when confronted with a situation in which the use of the L2 is required.

In other words, when confronted with the same challenge, or situation, during a daily activity, a learner at a higher level will be able to accomplish more than one at a lower level. The former will, for example, have a higher degree of understanding of a text, will be able to summarise its content, and make inferences about the author's point of view or purpose. The latter, on the other hand, will only be able to capture some concrete facts (CCLB, 2015b). Accordingly, the stages of progression of the CLB model relate to the learner's ability to perform simple tasks in non-demanding contexts (Stage 1, Benchmark 1-4), to perform moderately complex tasks in moderately demanding context (Stage 2, Benchmark 5-8), and ultimately achieve complex and very complex tasks in demanding contexts (Stage 3, Benchmark 9-12). The CLB three-stage model is comparable with the CEFR three-stage model, whereby the learner progresses from level A (A1 and A2), through the level B (B1 and B2) to reach Level C (C1 and C2) (Council of Europe, 2001). Because ability is intended as resulting from the use of language in real-life situations, increasing the learner's degree of familiarity with both the task and the context in which the task is carried out contributes to the learner's progress between levels.

Familiarity with context in which language is used (Gumperz, 1968, 1982, 2003) and tasks, for the international students in this research, refers to the challenge of meeting the language demands of the recruitment protocol as relevant to the employer (Gillen, 2009; Kantrowitz, 2005; Kovach, 2009; Sethi & Seth, 2009). Greater familiarity with tasks and context of recruitment decreases the complexity of the task and allows for a student to better meet employers' demands (Chakraborty, 2009a, 2009b; McGahern, 2009; Sharma, Roychowdhury, & Verma, 2009). In a series of studies conducted in Canada on the language challenges encountered by international graduates when seeking

employment, familiarity with recruitment protocols and best practices was found to be instrumental in strengthening the chances of success (Arthur & Flynn, 2013; Nunes & Arthur, 2013). Likewise, the team of Canadian researchers who developed the CLB-based test for assessing the language ability of internationally educated nurses seeking professional in Canada, reported that a candidate's familiarity with the intricacies of the profession, albeit acquired in a foreign country, was instrumental in the candidate's test performance (CCLB, 2003, 2004; CELBAN Research Team, 2002). The role of familiarity has, thus, important pedagogical implications, particularly relevant to this dissertation. They are discussed next.

2.4 L2 teaching and learning with the CLB and CEFR frameworks

As frameworks of reference, neither the CLB nor the CEFR are tied to any specific instructional method or technique (CCLB, 2015b). As such, concerning teaching, the two frameworks address the 'what', intended as the Can Do descriptive statements related to successive levels of language ability. The 'how', on the other hand, is regarded as a prerogative of the educators tasked with developing a curriculum and a syllabus based on their learners and the teaching context (p.48). The 20th century has seen an increased attention towards L2 teaching methods which accounts for their proliferation (Brown, 2007a). The 21st century research views L2 teaching as a matter of making use of the theoretical foundations, and the most relevant materials, to ensure that teaching meets the needs of the target learner population (CCLB, 2005, 2015a). Teaching by principles (Brown, 2007a, 2007b) blends previous methods to ensure that a teacher can provide the authentic uses of L2 in a language classroom. To that end, L2 teachers decide the specific content, that is the authentic material to use so that students can accomplish the communicative tasks planned in the curriculum and

course. Each task becomes an opportunity to develop the elements of communicative competence and language ability.

The development of language ability, and acquisition of communicative competence (Hymes, 1972), in fact, is not necessarily tied to formal instruction but it is acknowledged to result as a function of the learner's interaction with more knowledgeable members of a community inside and outside the boundaries of a formal L2 classroom. This language socialisation perspective (Duff, 2012; Schieffelin & Ochs, 1986) is central to the understanding of students' progress along the language ability continuum. From this perspective, classroom activities that foster teacher-student and student-student interaction conducted in non-language courses, have a significant socialising potential to contribute to a learner's development of academic discourse (Duff, 2007, 2010; Duff & Talmy, 2011; Morita, 2000, 2004; Morita & Kobayashi, 2008). Likewise, as learners transition from more formal educational contexts into professional ones, either by participating to on-the-job internships or by availing of integrative co-op opportunities, they are socialised into the language and literacy practices, and cultures, of the new setting (Duff, 2008b, p. 257). By engaging the learner in specific interactional situations (as 'speech acts' in Hymes, 1972), the community in which the learner enters, as novice or apprentice, equips him or her with the competence necessary to fully, and successfully, participate in that community (Lave & Wenger, 1991).

In line with Vygotsky's (1978) sociocultural framework, because learning is facilitated by the process of interaction between the individual and society, the "guided interactions" between expert and novices in a community allow for the progression of the latter into becoming active contributors to the practices of that community (Lave & Wenger, 1991; Schieffelin & Ochs, 1986). This is in contrast with the acquisition of decontextualized

knowledge (Brown, Collins, & Duguid, 1989). Practices, in that regard, are intended as naturally occurring verbal (either oral or written) and non-verbal, exchanges used to achieve communicative goals in real life situations (Gumperz, 1982; Gumperz & Cook-Gumperz, 2005). As such, they are culturally appropriate to the context in which they are used. In his seminal work, Gumperz (1982) coined the term "contextualization cue" to refer to how interlocutors respectively signal and interpret the messages that are exchanged, demonstrating that contextualization cues are by and large culturally determined. Viewing learning as socially situated entails that all parties involved in the socialisation process be "agents in the formation of competence" (Ochs & Schieffelin, 2012, p. 5) by being "active contributors" (Schieffelin & Ochs, 1986, p. 165).

Viewing the process of development of language ability as potentially independent from formal instruction, and depended on social interaction, entails putting the learner at the centre of the learning process. As Skehan (1998) points out, the demands posed on the language learner (as user) impinge on the linguistic code itself, the cognitive complexity of a communicative task (as contextually and culturally situated), and stress factors, such as time, pressure, or stakes. Furthermore, progress, as articulated in the CLB and CEFR, is viewed as unstructured and unpredictable, whereby the learner is assumed to progress in terms of his or her degree of ability to succeed in the task (CCLB, 2015b, p.12). In other words, the frameworks acknowledge that a learner may succeed in some tasks and not in others, hence potentially belonging to different levels of ability along the continuum, and progressing differently along the scale. To provide guidance to specific learner populations, several sets of Can Do descriptors have been developed based on the CLB and the CEFR to better reflect the tasks most relevant to their age group (CCLB, 2005, 2015a), and language needs (CCLB, 2015b, 2016a).

These documents are intended to assist adult learners in identifying weaknesses and gaps in their language ability. Likewise, for CEFR (2001), Oskarsson (1978; 1980; 1984) has developed a self-assessment grid, to aide learners monitor and understand their progress. The use of the CLB (CCLB, 2005, 2013b, 2015a, 2016a) and that of the CEFR (Council of Europe, 2001, 2014b; North, 2014) is intended for a variety of purposes, including high stakes applications, such as admission to a postsecondary institution, in a variety of academic, professional, and social settings. To that end, tailored assessment instruments have been developed (see for example, the CELBAN test mentioned above). However, given the scope of this dissertation, the development and use of the Portfolio, especially the European Language Portfolio (ELP) has value (Bruen & Sudhershan, 2009; CCLB, 2016b; Council of Europe, 2001, 2002, 2003, 2011a, 2017a, 2017c).

The ELP was designed with the aim of helping learners give shape and coherence to their experience of learning and using languages other than their first language (Council of Europe, 2017c). The second critical characteristic of the ELP is that it accounts for a learner's intercultural experience (Little & Simpson, 2003). To that end, the ELP is intended to support the development of learner autonomy, plurilingualism, and intercultural awareness and competence (Council of Europe, 2002, 2003, 2011). In addition, the Autobiography of Intercultural Encounters (AIE) (Council of Europe, 2009, 2014a), that accompanies the ELP, is designed to foster and guide learner's critical reflection and awareness about intercultural encounters that take place inside and outside the formal educational context. I discuss the intercultural aspect of communicative competence next.

2.5 Intercultural competence

As Fantini (2008, p. 21) points out “acceptance by others is more often strained by offending behaviours than incorrect grammar”. It is by understanding the cultural dimension of language that one avoids becoming a “fluent fool” (Bennett, 1997). It is now generally accepted, even if still not widely practiced, that "all language education should always also be intercultural education" (Sercu, 2004, p. 72). A number of significant studies conducted among foreign language teachers around the world showed a high level of awareness of the importance of integrating intercultural competence in the foreign language curriculum, and the willingness to comply (Aleksandrowicz-Pędich, Draghicescu, Issaiass, & Sabec, 2003; Byram & Risager, 1999; Sercu, 2001; Sercu & Bandura, 2005). However, as Sercu and Bandura (2005) point out, this widespread willingness is neither reflected in teaching practice nor in the definition of goals of foreign language education.

Intercultural competence is intended as the “ability to communicate effectively and appropriately in intercultural situations based on one’s intercultural knowledge, skills and attitudes” (Deardorff, 2006, pp.247-248) and comprises both effective and appropriate behaviour and communication (Deardorff, 2011; Spitzberg, 1989; Spitzberg & Changnon, 2009). Specifically, according to Spitzberg (1989) “competence in communicating can be viewed as an evaluative impression of communication quality. Quality in this instance is referenced by the criteria of appropriateness (avoiding the violation of valued rules or expectancies) and effectiveness (the achievement of valued objectives or rewards) (pp. 249-250). Intercultural Competence is a complex construct that involves more than one component. For example, as Deardorff (2006) points out, “knowledge or language does

not guarantee intercultural competence" (p.260). For this reason, reaching some form of consensus on the definition of intercultural competence has engaged researchers for decades. Intercultural competence has been extensively researched in the area of communication for over half a century (Deardorff, 2006). Most recently, intercultural competence has been studied within the broad context of higher education (Deardorff & Jones, 2012; Deardorff & Van Gaalen, 2012), and especially as an outcome of postsecondary education, within the growing research on school-to-work transition and graduate's attributes (Ahern, O'Connor, McRuairc, McNamara, & O'Donnell, 2012; Barrie, 2006; Symes, Thomas, & Ranmuthugala, 2013).

According to the scholars who partook in Deardorff's (2006) Delphi study, "the reason most often cited for a more general definition of intercultural competence is that administrators need an institutional definition that works with all students in all situations, regardless of their majors" (p.248). In line with this, "the definition deemed most applicable to institutions' internationalization strategies was found to be derived from Byram's (1997) work" (p.247). It was summarized as follows: "Knowledge of others; knowledge of self; skills to interpret and relate; skills to discover and/or to interact; valuing others' values, beliefs, and behaviors; and relativizing one's self". The second highest rated definition came from Lambert (1994) in which the author identifies the interplay of five components, i.e. world knowledge, foreign language proficiency, cultural empathy, approval of foreign people and cultures, ability to practice one's profession in an international setting" (Lambert, 1994, p. 9).

However, as Yershova and her co-researchers argue (Yershova, DeJaeghere, & Mestenhauser, 2000), the most compelling aspect associated with the study of

intercultural competence in educational contexts goes beyond the simple identification of the elements that constitute it. Rather it is whether, as "the study of the individual's response to encountering cultural difference", understood as an "individual's ability to manage cultural difference", intercultural competence is approached "considering it a problem", or "regarding it as an opportunity for learning and personal growth" (p.43). The juxtaposition of these two perspectives appears particularly relevant to this dissertation for several reasons. First, it can aid in the analysis and understanding of some international students' responses to the challenges posed by the program in which they enrolled. Second, it could help better evaluate the effectiveness of the strategies currently adopted at a university and faculty level.

The problem oriented approach, or "fix-the-problem approach" (p.43), as Yershova et al. labeled the first perspective, is perhaps the most traditional and widely adopted approach. It finds its rationale in the very practical concerns associated with the need to help international learners interculturally adjust to the unfamiliar cultural environments of the host country and institution. This approach views cultural differences as impeding or detrimental to effective intercultural performance. Conversely, the developmental perspective focuses on the "potential for learning and transformation inherent in an intercultural experience" (p.44) and conceptualizes the acquisition of intercultural competence as a developmental process. Rather than a matter of adjusting certain attitudes and modifying certain behaviours, the developmental perspective views acquiring competence as a "consciousness-altering process", supported by continuous "reflection and analysis" (p.45). While in the former, the learner would respond with a "fight or flight" reaction, which would thwart the learner's ability to accommodate

cultural difference, in the latter, intercultural experiences would give the learner an impetus to start developing intercultural awareness, self-awareness, and deeper and broader understanding of the new environment. Learners would be "forced into new levels of consciousness and understanding" by the power of the intercultural experience, their "cognitive depth and breadth increased", and their "emotional and behavioural openness and flexibility" enhanced (p.45). Otherwise, their transition from the assumption of centrality of their own culture to the perception of other cultures as "viable constructions", as Bennett argues, (1993, p. 66) would become extremely difficult, if not impossible, and the development of intercultural competence problematic.

As found, inter alia, in Byram (1997) and Deardorff (2004, 2006), Yershova et. al. (2000) identify knowledge, skills, and attitudes as the dimensions of intercultural competence. Traditionally, knowledge refers to the cognitive dimension of intercultural competence and encompasses "factual knowledge of, or about, the host culture" (Yershova et al., 2000, p. 47). Notwithstanding the importance of factual knowledge, as a means to explain and manage difficulties sojourners face in adjusting to unfamiliar cultural environments, value can be found in attaining a "culture-general knowledge" (p. 47). Such knowledge is intended as the knowledge that results from "the process of in-depth understanding of certain phenomena via a range of information gained through conscious learning and personal experience and observation" (Ting-Toomey, 1999, p. 50). To achieve that, skills for acquiring and processing knowledge about other cultures as well as one's own culture, and attitude are key (Deardorff, 2006). The skills that researchers, among whom Deardorff (2006), indicated as critical in the process of acquiring intercultural competence, are "skills to analyze, interpret, and relate, as well as

skills to listen and observe" (p. 248). This is in line with Yershova et al. (2000), who argue that the intercultural perspective along with intellectual competencies are integral to developing intercultural competence. According to the authors, important are cognitive flexibility and comparative thinking skills, perhaps the most neglected and yet the most pervasively used, being practiced every time individuals explain themselves to others.

However, knowledge and skills alone are not sufficient to achieve intercultural competence according to researchers. In both her Process and in her Pyramid model of intercultural competence, Deardorff (2004, 2006, 2009, 2012) argues that the degree of intercultural competence depends on the degree knowledge and skills achieved but it begins with attitudes. Process and progress move from the individual level of attitudes and personal attributes to interaction level (outcomes). Byram (1997) concurs in stating that to ensure the process of development of intercultural competence, attitude is a fundamental starting point. Emphasizing the importance of attitude, openness (withholding judgement), respect (valuing other cultures), and curiosity and discovery (tolerating ambiguity, approval of foreign people and cultures) are viewed as fundamental to intercultural competence. It comprises what Deardorff (2004) calls process orientation (mindfulness), considered instrumental throughout the learning process, and intended as being aware of the learning that takes place at each level and the necessary process skills that are needed for acquisition of intercultural competence.

Okayama, Furuto, and Edmondson (2001) reinforce the foundational importance of attitude by stating that perhaps the most important element of intercultural competence is the ability of the learner "to maintain culturally competent attitudes", as "new knowledge and skills" are attained and "new relationships" are built (p. 97). "Awareness, the valuing

of all cultures, and a willingness to make changes are underlying attitudes that support everything that can be taught or learned" (p. 97). According to Lynch and Hanson (2011) "after all the books have been read and the skills learned and practiced, the cross-cultural effectiveness of each of us will vary. And it will vary more by what we bring to the learning than by what we have learned" (p. 510). For Deardorff, the ongoing process of intercultural competence development is a continual process of improvement, and as such, one may never achieve ultimate intercultural competence.

2.6 Learning and assessment of intercultural competence

In the context of postsecondary education, and particularly within the scope of internationalization strategies of a university, agreeing on what knowledge, skills, attitudes, are central to the development of intercultural competence in international learners is important. Equally important is ensuring that the development of the components of intercultural competence is addressed. Institutions engaged in internationalisation should pay attention to the design and implementation of competence-building curricular and co-curricular activities. Such activities should aim at helping students develop intercultural competence (i.e., course work, on campus interaction or project-based teamwork entailing the cooperation of students from different cultural backgrounds, etc.) as well as acquire the necessary cognitive skills (e.g. comparative thinking skills), that are integral to developing intercultural competence (Deardorff, 2011).

Moreover, to ensure that progress is achieved, progressive assessment throughout the program would be advisable. While the two definitions of intercultural competence, namely the one proposed by Byram (1997) and the one by Lambert (1994) emerged as the

most widely accepted by scholars in Deardorff's 2006 study, debates remain on whether "measuring intercultural competence is specific to context, situation, and relation" (Deardorff, 2006, p. 248). Despite this, all institutions that participated in Deardorff's study confirmed that assessment is important, while thirty-eight percent reported that some form of assessment of intercultural competence was implemented at their institutions (p.249). Among the preferred methods of assessment being used include student interviews, student papers and presentations, student portfolios, observation of students, professor evaluations (in courses), and pre- and post-tests.

While it is important for a postsecondary institution to ensure that all its students can develop and acquire intercultural competence, emphasis should be put on the need to help and assist international students at the institution along the process. Case in point, if Byram stated that "linguistic competence plays a key role" (Byram, 1997, p. 34) in the development of intercultural competence, and Lambert (1994) included the foreign language proficiency in its definition of intercultural competence, then the development of intercultural competence in a foreign language context warrants particular attention. Hence, the following section addresses intercultural communicative competence.

2.7 Conceptualising Intercultural Communicative Competence

Over the past thirty years, research on intercultural communicative competence has continued to grow. More recently its interest has expanded to include the aspect of teaching and learning. According to Balboni (2006) the need to move from the mainly descriptive nature of the majority of studies on intercultural communicative competence, towards a model of competence building, finds its rational in the simple fact that "descriptions cannot be taught" while "models can be taught, and competences, based on

models, developed" (p.5). In his argument, Balboni views a model of communicative competence as a generative framework, conceived to generate communicative performance, and created in such a way that would allow the progressive deepening of competence, by building subsequent layers of complexity in depth rather than in width. In the author's opinion, such a model would have the necessary quality of being simple to teach, and sufficiently flexible to allow for continuous update as the learner's experiences in diverse situations, context and interactions accumulate.

In his framework for intercultural communicative competence, Michael Byram (1997) builds on a previous model by van Ek (1986) and extends the concept of communicative competence ('communicative ability' in van Ek) to include that of intercultural competence (1997). In his framework, Byram defines five components of intercultural competence (or *savoirs*) which encompass the 'knowledge, skills, and attitudes' necessary to communicate effectively and appropriately in intercultural situations. Byram's savoirs focus on culture and the relationship between cultures, not language. Hence, they address the ability to interact with culturally diverse people in one's own language. It is by linking the savoirs to foreign language competence that Byram, Gribkova and Starkley, (2002) address the ability of the learner to use the foreign language appropriately in interactions with people of other cultures. In their practical guide for foreign language teachers, Byram et al. (2002) address the challenges related to the introduction of the intercultural component in language teaching, especially in matters of assessment. Identified as the most likely reason for the foreign language teachers' reluctance to integrate intercultural competence in the classroom, assessment of intercultural competence is an area that researchers describe as still problematic and

underdeveloped (Crichton & Scarino, 2011; Liddicoat, Papademetre, Scarino, & Kohler, 2003). Since his early work, Byram (1997) contends the inadequacy of widely adopted traditional psychometric approaches (multiple-choice or cloze tests of target culture) as products of a traditional knowledge-transfer approach (Byram & Risager, 1999; Sercu, 2001). He argues that these assessment methods over-simplify and misrepresent learner's ability to ensure objectivity in measurement. Moreover, they are incomplete, if one agrees that knowledge and understanding are only two components of intercultural competence (Byram et al, 2002).

Alternatively, more holistic assessments, such as the portfolio format linked to the CEFR, the Common European Framework of Reference for Languages (Council of Europe, 2014b), are preferable, despite their limitations, such as excessive 'subjectivity', and poor reliability from the standpoint of an external assessor (Byram et al. , 2002). According to Little and Simpson (2003) a viable improvement to current assessment practices would be the development of an empirically validated scale of intercultural competence such as that which exist in CEFR (and in CLB) for language competence. That would entail the development of intercultural Can Do descriptors, which, as Murphy-Lejeune (2007) argues would reflect the equal role of culture and language competence in ESL teaching and assessment while facilitating the process of formal recognition by educational institutions and employers.

2.8 Intercultural Can Do Descriptors

Recommendations that such descriptors be developed are advanced by a growing number of researchers working to improve CEFR (e.g. Bruen, Péchenart, & Crosbie, 2010; Bruen & Sudhershan, 2009). According to Byram (1997, 2002), Can Do

intercultural descriptors in which subcomponents of intercultural competence (knowledge, skills, attitudes) can be expressed in a similar way as to those designed for language can be developed (see Byram et al., 2002, p. 31 for examples). The main challenge, however, he points out, rests on the "scalar" representation of learner's progress as it happens in language competence (A1-C2 in CEFR, 1-12- point scale in CLB). Although intercultural competence models are designed to illustrate progress in acculturation (e.g. Berry, 1970; Lysgaard, 1955), they lack discrete steps of advancement that can be found in frameworks of language ability. As a first step, both Sercu (2004) and Byram (1997) suggest that tailored descriptors of threshold (i.e. pass/ fail) at or above which a learner can be considered interculturally competent, be developed for narrow specific teaching and assessment contexts and tasks.

As it is for existing language Can Do descriptors (Centre for Canadian Language Benchmarks, 2013; Council of Europe, 2014b), intercultural Can Do descriptors would necessarily be highly context-relevant, as certain components (knowledge, skills, attitudes) may be emphasized more than others depending on the circumstances in question (Byram, 1997). The alignment of intercultural with language Can Do descriptors would mark the threshold of intercultural communicative competence, at or above which an international student could be considered adequately competent both culturally and linguistically to meet the specific challenge of the task at hand. In my research, if one understands international students' challenge in terms of 'passing vs. failing' a work-term, then ad hoc intercultural Can Do descriptors could be developed. In line with Deardorff (2006, p. 256), however, the development of such descriptors, albeit context-

specific, should also "provide a basis for general assessment of intercultural competence, thus embracing both general and specific definitions".

I argue that additional considerations are required when intercultural competence is discussed within the educational boundaries of a program such as the one central to this dissertation. Notwithstanding the possibility to consider only key work term-related encounters and interactions in which international students are expected to be (inter)culturally competent, a wide range of situations, circumstances, and interlocutors emerges. Despite the adoption of rather standardised recruitment protocols and a relatively consistent set of cultural norms in the workplace, each work term competition and placement is unique. Furthermore, within the scope of internationalisation, curricular and co-curricular activities, initiatives, and strategies are being developed and implemented at program, faculty and university level across the country and worldwide (Memorial University & Office of the Vice-President (Research), 2015). Since Byram and Deardorff's studies cited above, intercultural competence in educational settings has become an expectation for all students, faculty, and staff attainable through formal, non-formal, and informal channels. Each learner's response to cultural difference is subjective (Yershova et al., 2000). It was found to vary depending on the situation, the purpose of the interaction, and the individual's willingness to engage (Molinsky, 2007; 2010).

As Martín Rojo (2010) contends, a student-centred situational approach to researching the process of acculturation, is preferable to the U-curve (Lysgaard, 1955) or the Berry's dual identification models (Berry, 2003). As Molinsky (2010) points out, it may help identify the specific situations in which "one thrives versus those in which one struggles" (p.726). Aligned with this, is the approach of the Language Policy Division of

the Council of Europe (Council of Europe, 2003, 2011a, 2003, 2011b, 2014a). The Autobiography of Intercultural Encounters (AIE) (Council of Europe, 2009, 2014a) is a document which encourages learners to critically reflect on and learn from their most memorable intercultural encounters in which they have taken part, those that have made a strong impression, had a strong impact, or had a long lasting effect on them.

The document is designed to guide learners through a set of open questions aimed at eliciting an analysis of their own individual response to a meaningful experience. Purpose of this activity is the learner's identification of differences in his or her own intercultural competence as they emerge from the learner's comparison of past and current attitudes, behaviours, knowledge, and skill. Importantly, this guided retrospective self-analysis of the way the learner acted at the time of the encounter against how the learner would act today is intended to promote change in the learner by inspiring action that might change how the learner might respond in the future. Accordingly, the Autobiography is viewed as an effective tool that fosters a learner's intercultural self-awareness and lifelong learning (Council of Europe, 2009). In that regard, the Autobiography is intended as a learner's private document that can be shared with a teacher or tutor in a formal educational setting within a general framework of language education that fosters respect for diversity, intercultural dialogue, and social inclusion. In that, it is intended to complement the European Language Portfolio discussed in the previous section.

Importantly, because the learner is free to select memorable intercultural encounters that occurred in any formal or informal educational contexts, the Autobiography can be regarded as important instrument through which an institution can evaluate its

internationalisation strategies and initiatives. For example, Deardorff (2011) argues that it is crucial for institutions to maximise the curricular and co-curricular resources on campus to create opportunities that further students' intercultural competence and raise intercultural awareness. Among the ones suggested by the author, speaker series, book clubs, mentoring programs. As Bok (2009) points out, undergraduate students learn best outside the classroom, during dorm room discussions, mealtime conversations, and other group activities on campus. As the experts in Deardorff's study (2011) concurred, "there is a great need for programs that bring domestic and international students together in meaningful interactions" (p.72) aimed at building relationships between cohorts. It is with this perspective in mind that I move to discuss the engineering context next.

2.9 The engineering context

Effective communication of future engineers is a core requirement of the profession (McMasters, 2004, 2006; McMasters & Komerath, 2005; NAE, 2004, 2005, 2013). For that reason, in the North American context of engineering education, the development of communication skills for professional practice is regarded as a required outcome of postsecondary education (CEAB, 2012-2013, 2014). As it happens for most professional fields, English is regarded as the language of Engineering. Moreover, a forecasted increase in worldwide mobility towards both established and emerging markets (Brookfield Global Relocation Services, 2013) points at the need for current and future engineers to be both proficient in the English language and be interculturally competent. To the individual engineer, international mobility often represents an important stepping-stone towards faster career advancement within a company, or increased marketability with competing companies (Dickmann & Doherty, 2010; Hippler, 2009; Jokinen, 2010).

However, access to these opportunities, and positive outcomes from them, are contingent on the level of preparedness of the engineering professional (Del Vitto, 2008; Kupka et al., 2009).

Industry dynamics, increased transnational cooperation, workplace diversity (McCall, 2002; Nungesser, 2002) and fierce international competition, require companies to build and sustain a strong competitive advantage by hiring engineers who are appropriate for the task, who are fluent in English, and who are likely to perform well in diverse contexts (Bozkurt & Mohr, 2011; Ramalu, Raduan Che, Kumar, & Uli, 2010; Riemer, 2002, 2007). For this reason, the education and training of future engineers is being forced to deal with new professional demands (Annabi & McGann, 2012; CEAB, 2012-2013, 2014; Council National Research, 2002; Crawley, Cha, Malmqvist, & Brodeur, 2008; Crawley & Waitz, 2013; "Critical Skills for Workforce 2020," 2011; International Engineering Alliance, 2013a, 2013c; McCall, 2002; NAE, 2004, 2005, 2013; Nungesser, 2002; Whitman, Toro-Ramos, & Skinner, 2007). One consequence of this challenge is that engineering education is increasingly becoming synonymous with the well-rounded education of a globally-minded professional− who can work well with people of different cultural, racial, and linguistic backgrounds (Downey & Lucena, 2004; Downey et al., 2006; Symes et al., 2013). A new graduate is expected to be able to assess and implement decisions with confidence and efficiency in multicultural contexts (Allan & Chisholm, 2008; Downey et al., 2006; Elliott & Fujioka-Ito, 2012), and is equally strong in both technical and professional skills (Borrego & Bernhard, 2011; Colby & Sullivan, 2008; Gokuladas, 2010; Komerath & Maughmer, 2005; Sheppard, Macatangay, Colby, & Sullivan, 2009; The Conference Board of Canada, 2012).

Furthermore, efforts of engineering faculties in Canada (Association of Universities and Colleges of Canada, 2013) and worldwide (Colby & Sullivan, 2008) are directed at producing graduates who are readily employable upon graduation (Allan & Chisholm, 2008; Callanan & Benzing, 2004; Schuurman et al., 2008). Engineering faculties in non-English-speaking countries have acknowledged the importance of ensuring that their graduates can compete on the global arena. Accordingly, significant research investigating ways to improve the teaching and assessment of the English language and intercultural competence has occupied international researchers in the field of engineering education (Baram-Tsabari & Lewenstein, 2013; Baytiyeh & Naja, 2012; Crawley et al., 2008; Prescott, El-Sakran, Albasha, Aloul, & Al-Assaf, 2012). In North American Engineering schools, the employability of graduates is also at the centre of attention, and the literature on the development of professional communication as a graduate attribute has burgeoned in recent years (Caron, Gopakumar, Dysart-Gale, & Harsh, 2014; Cloutier, Hugo, & Sellens, 2012; Engineers Mobility Forum, 2009; Garcia Fernandez & Tovar Caro, 2011; Goh, 2012; Harris, Steele, & Russell, 2011; Kozanitis & Cloutier, 2011). With Canada ranking fourth among the top exporters of engineering services internationally, challenges and opportunities associated with the employability of new graduates have become a priority for Canadian engineering faculties (Engineers Canada, 2012a, 2012b, 2013; Engineers Canada & C4SE, 2015; George, Chaze, Brennenstuhl, & Fuller-Thomson, 2012; Prism Economics and Analysis, 2010, 2012; Randstad Engineering & Engineers Canada, 2013).

Global mobility of engineering graduates is made possible also by the existence of international educational accords between countries. Based on the principle of substantial

equivalence, these accords allow for the mutual recognition of qualifications among graduates of accredited engineering programs offered by postsecondary institutions of signatory countries (International Engineering Alliance, 2013b, 2014a, 2014b). As one of the 18 countries signatory of the Washington Accord (Engineers Canada, 2016; Hanrahan, 2011), Canada adheres to the consensus on the 12 Graduate Attributes (GAs) indicated in the accord. The Canadian Engineering Accreditation Board (CEAB) is the national body tasked with ensuring that the engineering programs offered by degrees granting institutions in the country meet academic requirements for professional practice (Engineers Canada, 2012a, 2012b, 2016). To that end, CEAB publishes a set of accreditation guidelines for the use of Canadian engineering faculties who intend to obtain, or maintain, accreditation status for their programs (CEAB, 2012-2013, 2014). Acting within its mandate, CEAB conducts at regular intervals so called 'accreditation site visits' to said institutions with the purpose of assessing whether the extent to which each program within an engineering faculty meets the requirements set out in the guidelines suffice to guarantee accreditation status.

From what discussed above, the value that an engineering faculty places on being able to offer its students degree programs that are internationally accredited can be easily guessed. However, satisfying CEAB requirements and meeting the expectations of the visiting accreditation delegation is often a challenge. The reason for this can be found in the intentional lack of prescriptive details provided in the Washington Accord (International Engineering Alliance, 2013b, 2014b) and, consequently, in the CEAB guidelines (CEAB, 2014). As clarified in an International Engineering Alliance (2013) document, Graduate Attributes provide a "widely accepted common reference" and do

not constitute an "international standard" (p.3), nor they specify "performance indicators" (p.5). Instead, accredited programs "are not expected to have identical outcomes and content but rather produce graduates who could enter employment" (International Engineering Alliance, 2013b, p. 3). The attributes were developed to "give confidence that educational objectives of programmes are being achieved" (p.3). Accordingly, competence is stated in generic terms and is intended as being applicable to all engineering disciplines, it may be assessed "in different areas of practice and different types of work" (p.5). As such, the attributes should be interpreted contextually, and amplified or emphasised accordingly, "but must not altered or ignored" (p.5).

Canadian engineering institutions are given significant latitude (CEAB, 2014) in how to design of their programs and curricula, in line with the " freedom to design programmes with different detailed structures, learning pathways and modes of delivery" granted to signatories by the Accord (International Engineering Alliance, 2013b, p. 4). Notwithstanding these concessions, CEAB requires institutions to demonstrate that the graduates of an accredited program possess the 12 specified attributes at the time of graduation. Furthermore, in 2010, CEAB switched from the traditional input-based assessment of Graduate Attributes to the outcome-based evaluation of engineering programs in Canada (CEAB, 2012-2013) and postulated that engineering programs are expected to continually improve. As a result, currently, for a program to be accredited there must be processes in place that demonstrate that program outcomes are being assessed in the context of the 12 Graduate Attributes, and that the results are applied to the further development of that program (Frank, Kaupp, & Simper, 2015; Kaupp, Simper, & Frank, 2014; Simper, Kaupp, Frank, & Scott, 2015). In other words, while

postsecondary institutions in member countries conform to common educational guidelines in different ways, they all now include Graduate Attributes as assessable outcomes amongst their accreditation criteria (Iaacson, 2016). Within the scope of this dissertation, this represents both an opportunity and a challenge.

Listed as seventh among the 12 CEAB Graduate Attributes (CEAB, 2014), is 'Communication Skills' (sometimes referred to as GA:07). The criteria for this attribute outlined in the CEAB document read as follows:

> **Communication skills:** An ability to communicate complex engineering concepts within the profession and with society at large. Such ability includes reading, writing, speaking and listening, and the ability to comprehend and write effective reports and design documentation, and to give and effectively respond to clear instructions. (CEAB, 2014, p.14)

Ensuring and being able to demonstrate that a student possesses at graduation the communication skills as defined above is a requirement of every Bachelor of Engineering program in Canada that seeks to obtain or maintain accreditation. Indeed, the description encompasses the core tasks traditionally associated with the engineering profession for which rigorous accountability should be sought. However, the essential communication skills of today's professional engineers span beyond those detailed in GA:07.

Below I discuss the main trends and arguments surrounding the communication skills for the engineering professional as addressed in the literature reviewed for this dissertation. In line with current research in engineering education and practice, I make a case for the need to produce competitive graduates from Canadian engineering faculties who are well-rounded effective communicators. Namely, I view the latitude granted by CEAB and the Washington Accord to Canadian institutions as an opportunity for

improvement in the way communication skills are conceptualised and operationalised at the program and curriculum level. Prioritising mandatory accreditation requirements need not be an impediment to the development of communication skills that meet more comprehensive industry and employers' expectations. However, patters of emphasis in engineering education and gaps within existing curricula still weaken the employability of this cohort before and after graduation. Rapidly changing demographics in the composition of student population support a call for revaluation of assumptions about the effectiveness of widely adopted pedagogical approaches for the progressive development of professional communication skills leading up to graduation. In line with this, I argue that faculties should place greater attention on the development of language and intercultural competence of international students enrolled in Canadian co-op programs. Improvements should be introduced to the curriculum to address the challenges that this cohort encounters in the program and solutions should be investigated outside the boundaries of engineering education research.

The idea of constant improvement and innovation is central to the practice and education of engineering. What makes a better engineering professional and how engineering students can be better educated to become one, are questions that have warranted research and studies for decades. The fundamental purpose of engineering education in Canada is to build a student's knowledge based and attributes that enable a graduate to develop the competencies necessary for professional practice in the field (International Engineering Alliance, 2013b). The engineering profession is rapidly changing and increasingly demanding. New challenges and opportunities emerging from industry call upon educators to adjust their curricula and sharpen their teaching strategies

to better respond to the demands of the job market. In the next section I will address those challenges and opportunities as they are debated in the literature in engineering education, especially relating to engineering communication. I argue that to correctly understand communication in professional settings of Memorial international co-op students, an analysis of how the subject of communication and of competence in communication are conceptualized in engineering research and approached by engineering educators is essential.

2.10 Engineering communication in the professional and academic context

In the field of engineering communication has long been considered a core professional skill (Paretti, McNair, & Leydens, 2014). More recently, as the practice of engineering has expanded beyond national boundaries to take on a global dimension, the critical role of communication and its potential challenges have become central. The reason for this is simple. The quality of communication in engineering can have exceptionally high stakes. As Paretti et al. (2014) argue, in engineering, communication breakdowns or simple misunderstandings are often the central factors in engineering disasters. Striking cases have populated the news. For example, the 1986 explosion of NASA Space Shuttle *Challenger* seconds after take-off, as Winsor (1988) argues, has its roots in miscommunication. When they do not turn into tragedy, disasters in engineering may end up being extremely costly for the company (Isbell, Hardin, & Underwood, 2009). In 1999, the authors reported, a failure to recognize and correct an error in a transfer of information between the Mars Climate Orbiter spacecraft team in Colorado and the mission navigation team in California caused the Mars Polar Lander to crash on the planet surface. Preliminary findings released by NASA indicate that a simple

mismatch in communication between two project teams allowed for the use of different measuring units (i.e. English versus metric) during a critical spacecraft operation (Isbell et al., 2009). The inability of research teams to recognize and correct this simple error has had major implications, including the loss of a spacecraft valued over US$120 million.

Unarguably, examples like those mentioned above are as extreme as the consequences they created. However, I argue, when viewed in perspective they suggest a very important point that must be considered in discussing engineering professional communication and its pedagogy. The challenge in engineering communication does not come from seeking constant advancements and innovation but rather from adapting and strengthening how one responds to the challenges created by evolution and innovation. In that sense, researching and improving communication in the field of engineering requires constant adaptation to the challenges posed by the circumstances, media and contexts generated by professional setting towards an optimal fit of skills acquired and skills required (Katehi, 2005; McMasters, 2006; NAE, 2004; Rajala, 2012; Swarts & Odell, 2001; Whitman et al., 2007). It is in this perspective that advancements in communication for the engineering profession are to be collocated within engineering researchers and educators' attention.

The emergence of the profile of the 21st century professional engineer impelled researchers in engineering education to broaden the focus towards a more integrated approach that brings together technical and professional development. The mismatch between skills acquired during their formative years and skills expected by employers upon graduation is problematic (Colby & Sullivan, 2008; Sheppard, Macatangay, Colby, & Sullivan, 2009). In line with the overarching mandate of their programs, engineering

faculties are expected to respond to a growing demand for engineers (Besterfield- Sacre, Cox, Borrego, Beddoes, & Zhu, 2014; Borrego & Bernhard, 2011; Borrego & Newswander, 2008). Moreover, they are called to produce graduates that are ready to enter the profession and can function effectively in their professional role immediately upon graduation (Colby & Sullivan, 2008; Borrego & Bernhard, 2011). As a result, education in professional communication becomes central to resolve what can be considered an employment challenge. Weaknesses and lacunae in professional communication affect the great majority of graduates and extends across virtually all disciplines (Chamorro- Premuzic, Arteche, Bremner, Greven, & Furnham, 2010; Conley, 2012; Jackson, 2010; Jackson, 2011; Mitchell, Skinner, & White, 2010).

Employers in Canada and around the world expect and demand that every potential employee is a good communicator (Bogdan & Malgorzata, 2011; Cohen, 2009; Karan, 2011; Rutherford, 2011; Sahni, 2011; Sethi & Seth, 2009; The Conference Board of Canada, 2012), since effective communication are considered essential to prosper, or even survive, in a profession (Chakraborty, 2009a, 2009b; McGahern, 2009). Accordingly, employers today emphasize the importance of assessing a candidate's ability to communicate during recruitment (Gillen, 2009; Kovach, 2009; Rao, 2009; Sharma, 2009). Williams (2001) attributes the merit for classifying communication as professional skill and as central curricular outcome in USA to ABET, the American engineering accreditation commission (ABET, 2017). The inclusion of effective communication as a core outcome of undergraduate engineering education has provided fertile ground for collaboration between engineering and communication faculties (Williams, 2011). Early programs of writing across the curriculum and writing in the disciplines begun to appear

in the 1980s (Russell, 2002). In the 2000s in Europe the concept of content and language integrated learning begins to emerge (Paretti et al., 2014).

In their ongoing survey, Thaiss and Porter (2010) identified this trend of collaborating to develop assignments and approaches that support simultaneous development of content expertise and communication skills in 51 other countries including Canada. Such partnerships emphasize overlapping goals towards the creation of engineers that are both content and communication specialists (Winsor, 2006; Winsor & Lay, 1997). Furthermore, as the use of technology permeates practice, communication is redefined. Today engineers need to be able to communicate across cultural and disciplinary boundaries amid ever changing tools (Downey & Lucena, 2004; Downey et al., 2006; Paretti & McNair, 2008; Paretti & McNair, 2012). Research conducted by Levine et al. (2011) suggests that engineers today spend at least half a day in some type of communication activity using a variety of media, suggesting that engineers need multiple communication channels to be effective (see also Dennis, Fuller, & Valacich, 2008). To that end, new directions in engineering education research are gaining prominence (Paretti et al., 2014).

As Paretti et al. (2014) note, emerging trends in engineering programs promise to reconceptualise professional communication. The adoption of new acronym, WOVE, that is Writing, Oral, Visual, and Electronic (Leydens & Schneider, 2009), acknowledges that the traditional writing and oral communication in the engineering profession do not occur in a vacuum but are often embedded in dynamic, multimodal contexts. Furthermore, subsequent amendments to the WOVE acronym are proposed. For example, Leydens and Lucena (2009) advocate for the addition of Listening, intended as contextual listening as a

driver for change (Leydens, 2008; Leydens & Schneider, 2009), as a skill highly valued in engineering education yet virtually absent from the engineering communication curriculum (Paretti et al., 2014). Burnett (2008), on the other hand, suggests the addition of Nonverbal communication to list of skills worthy of inclusion in the future engineering curriculum that respond to the complex reality of the 21st century workplace.

Rapid technological innovation and changes in the dynamics of the workplace, often characterised by a greater demand for teamwork and virtual collaboration, pose significant challenges to young graduates who are professionally unprepared (Atman et al., 2010; Brunhaver, Korte, Lande, & Sheppard, 2010 ; Brunhaver et al., 2015; Duderstadt, 2007, 2010; Levine et al., 2011; NAE, 2005, 2013; National Research Council, 2008). Sheri Sheppard and her team at Stanford University have argued against the obsolescence of engineering education for more than a decade (Brunhaver, Korte, Barley, & Sheppard, 2017 in Progress; Brunhaver et al., 2010 ; Brunhaver et al., 2015; Sheppard et al., 2008; Sheppard, Matusovich, Atman, Streveler, & Miller, 2011). Aim of this research is to bring postsecondary engineering institutions to bridge the gap between engineering education and professional practice and contribute to the formation of a well-rounded professional engineer (Colby & Sullivan, 2008).

Colby and Sullivan (2008) point out that patterns of emphasis in engineering education make the technical aspect of the profession a priority over the development of other skills. The "forever expanding" (Sheppard et. al., 2009, p. xxiii) technical knowledge is important to contribute to projects that are constantly growing in scale, geographical scope, and complexity. However, adopting a curriculum where non-technical skills are de-emphasised fosters the culture of training "just an expert

technician" (Sheppard et. al., 2009, p.xxi) rather than that of nurturing a well-rounded professional engineer (Borrego & Bernhard, 2011). The efforts to cover technical knowledge comprehensively, and putting theory before practice, limit the opportunity for students to practice important aspects of the profession while in school (Sheppard et al., 2009). The root of the employability problem for engineering students, these authors argue, is to be found in the progressive changes occurred in recent decades in the paradigmatic shift toward teaching engineering science instead of engineering practice (Borrego & Bernhard, 2011). As a result, engineering education and the real world demands on engineers progressively drifted apart and the gap between skills acquired by students and those expected by employers widened.

Despite the substantial changes introduced to both the curriculum and the pedagogy of engineering since those early debates, the consensus among the engineering community is that more work needs to be done to bring graduates' communication skills, teamwork skills, and lifelong learning skills, to the level demanded by industry (Brunhaver et al., 2017 in Progress). The reality of the engineering profession today is, according to some researchers, that downsizing in favour of outsourcing services is, oftentimes, a more economically viable and equally reliable option (Besterfield-Sacre, Shuman, Wolfe, Clark, & Yildirim, 2007; Duderstadt, 2010; Freeman & Salzman, 2017 in Progress). A realignment of engineering education with the evolving reality of the industry and the profession is urgently needed if one agrees that the employment of North American graduates is at risk. Accordingly, the authors recommend that engineering pedagogy be redesigned so that professional content and skills can be better developed inside as well as outside the classroom throughout the undergraduate program (Brunhaver

et al., 2017 in Progress). Exposure to professional practice through collaborative and co-operative learning such as classroom projects, co-op placements, internships, involvement in professional societies would give graduates a better understanding of what employment in the engineering sector entails (Korte, 2009; Sheppard et al., 2008).

2.11 Collaborative and co-operative learning in engineering education

In general terms, one could argue that the approach to pedagogy adopted by engineering faculties reflects the traditional approach adopted by engineers in solving engineering problems. Simply put, engineering learning environments undergo continual phases of design, test, and redesign to achieve results that are optimal for generating the best change in engineering students. The practice of aligning pedagogy with outcomes and content requirements, as Newstetter and Svinicki (2014) argue, oftentimes is carried out by faculty members "who are not instructional designers with a toolkit of learning fundamentals but rather accomplished disciplinary experts" (p.29). To provide engineering educators with relevant, and useful, fundamental learning paradigms of engineering education practice, the authors outline three most commonly adopted frameworks, namely the Behaviourist, the Cognitivist, and the framework of situated learning. I focus my attention on the third and last theory of learning discussed in Newstetter and Svinicki (2014) as the framework that best address the learning that takes place in classroom collaborative activities as well as during professional co-operative experiences central to this dissertation.

The situated learning approach, widely espoused by engineering researchers and institutions, claims that effective communication skills, among other professional skills, develop naturally because of activities conducted in collaborative classroom

environments (Borrego & Bernhard, 2011; Colby & Sullivan, 2008; Lappalainen, 2009; Paretti, 2008; Sheppard et al., 2009). As Greeno (2006) points out, in the situated perspective, knowledge is shared among the interacting individuals and the groups. Knowing, is intended as the individual's "ability to participate in the activities of a specific community" (Newstetter & Svinicki, 2014, p. 38). Learning, is described as a movement from peripheral forms of participation to full participation in the activities of the community of practice (Lave & Wenger, 1991). As they explained in their seminal book, Lave and Wenger (1991) identify in the opportunity granted to the new participants, the apprentices of the community, to observe more experience members and to practice with them the activities of the community, the key factor that allows learning to occur. The process of learning, therefore, results from the interaction between the experience member and the apprentice and is observable in the progressive ability of the apprentice to move from peripheral to active participant (Newstetter & Svinicki, 2014).

Knowledge and learning are situated in experience and are constructed and reinterpreted within a specific social context (Clartcey, 2008; Wenger, 2000). Constraints and affordances of social practices of that social context, thus, have the potential to shape learning significantly (Greeno, 2006). From this perspective, then, the quality of an apprentice's learning hinges on the quality of interaction, the quality of mentoring or coaching that the more experienced member is able and willing to provide, as well as on the desire, the motivation to share. Its premise rests on the concept of meaningful participation in the practice of the community that results from situated engagement in motivated action and interaction (Goodwin, 2000; Johri, Olds, & O'Connor, 2014). In fact, in the situated perspective, learning is not generalised, but always constrained and

constructed by what the community and its members value and embrace as they carry out cooperative activities (Newstetter & Svinicki, 2014).

In the context of engineering, the fundamental elements of the situated framework seem to provide a viable analytical viewpoint on learning (see table 3.1 in Johri et al., 2014, p. 55). Whether in school, as part of course-based projects, or on the job, engineering work is highly collaborative in nature. As discussed above, the development of collaborative skills through the introduction of project-based assignments designed around professional practice has become the norm in North American faculties to develop teamwork and communication skills. However, as Brown, Collins, and Duguid (1989) contend, educators should not take a prescriptive approach to situated learning and use it to design structures of participation in their classrooms or other educational learning contexts. Attempts to reproduce learning environments in schools designed to reproduce professional communities of practice would inevitably rest on the erroneous assumption that communities of practice are stable, fundamentally benign and bounded communities (Greeno, 1997). Critics of the framework, when adopted in formal educational settings, argue that the characteristics of Lave and Wenger's (1991) community of practice are far from the reality in which members operate. They are described, for example, as substantially harmonious and homogeneous communities whose members' past history and background is largely overlooked (Johri et al., 2014).

In Canada and around the world, global student mobility has created engineering faculties, and indeed universities, where heterogeneity is the norm. What is more, the linguistically and culturally diverse student population in Canada is growing at an impressive rate. Research shows that culturally diverse environments do not

automatically lead to intercultural contacts and learning experiences (Otten, 2003), even though they can contribute to an individual's communicative and intercultural proficiency (Engle & Engle, 2004; Freed, 1998; Llanes & Muñoz, 2009; Rees & Klapper, 2007; Williams, 2005). In fact, paradoxically, the mutual collaboration among students encouraged or endorsed by institutions can trigger conflict in a culturally diverse classroom, often resulting into the choice of international students to self-segregate both in and out of classroom (Otten, 2003; Sheridan, 2011; Spencer-Oatey & Dauber, 2015; Swaminathan & Alfred, 2001).

Analogously, co-op placements rest on the premise that by placing the student in the context of the profession, the student will acquire the skills employers value and develop the professional habits of their supervisors and other role models (Colby & Sullivan, 2008). As a teaching and learning opportunity, work-terms entail deductive learning based on the concept of practice (Sahni, 2011). The co-op work environment is conceptualised as a learning community (Wenger, McDermott, & Snyder, 2002) where situated learning can take place (Lave & Wenger, 1991) and the creation of opportunities to employ and develop professional skills is encouraged (Brown, 2010). Literature concerning the benefits associated with co-op education rests on the premise that, during a work term, the student develops hands on experience and familiarises with the professional environment outside the traditional academic (Pinelli & Hall, 2012; Pons, 2012; Schuurman et al., 2005, 2008). Schuurman, Pangborn, and McClintic (2008) argue that work-term experience has a considerable positive effect on engineering graduates' likelihood of receiving a job offer prior to graduation and a considerable increase in starting salary. To be more specific, the number of work experiences is positively

correlated with early career success, making work-term placement an important way to maximise employability.

While this can account for the growth in offering of co-op engineering programs in Canada, North America, and around the world (Colby & Sullivan, 2008), it does not consider the challenges associated with co-op placements of international students. But, what is overlooked in the literature is the fact that work-term placement is a competitive process also for work-term candidates (Cohen, 2009; Gillen, 2009). Performance during recruitment is important (Bardia, 2010; Kahn, 2010). International students are particularly vulnerable to this risk (Eyre, 2011; Javidan et al., 2010). For them, being competitive in a cultural context different from theirs (Anant, 2010; Molinsky, 2007, 2010; Munley, 2011; Vinay, 2009) can be a daunting task, which is often aggravated by weak English proficiency (Banerjee, 2009; Mishra, 2009; Rajini, 2009; Vandermeeren, 2005). This is particularly the case when the work-term competition begins during the first year of enrolment in the program, when little to no opportunity to develop soft skills tailored to the host country has presented itself. As Sheri Sheppard and her colleagues (2009) point out, opportunities to approximate professional practice, through participation in collaborative projects are typically provided late in the undergraduate program (Sheppard et al., 2009).

Moreover, large class sizes, students' individual level of proficiency in the language of the host country, lack of established social relationships on campus especially with local population, and time constraints may represent potent inhibitors potentially limiting participation of international students in classroom interaction. Also, an international student may be unwilling to "engage in behaviour that violates or conflicts with his or her

personal values and beliefs" (Molinsky, 2007, p. 728) to meet the demands of a host country (Chamberlin-Quinlisk, 2010; Sharma et al., 2009; Vinay, 2009). As Martín Rojo (2010) argues, intercultural misunderstandings are often interpreted as failure of communicative competence and are used to reinforce negative stereotyping while justifying social exclusion. Furthermore, as Barak (2017) points out that "one of the most significant problems in the workplace is exclusion" (p.5). That comprises both social exclusion and the implicit or explicit exclusion of individuals or groups "from job opportunities, information networks, team memberships, and decision-making process" (p.5). Her research on workplace diversity management is particularly troubling if viewed from the perspective of a foreign work term students. It points at a potential risk

Engineering faculties and universities around the country are addressing the challenges posed by diversity in different ways. Oftentime, the solutions they envision and implement entail some form of additional training and education tailored to the needs of this cohort. As Fox et al. (2016) argue, the practice of post-entry diagnostic assessment of L2 engineering first-year students has increased in recent years for the early identification of at-risk international students needing academic support. This practice was prompted by concerns about retention and program completion of linguistically and culturally diverse first-year engineering students who are "at risk of failing or near-failing the first year" (p.43). The test they designed is an academic language test fine grained for the engineering domain. The assessment procedure is situated with engineering text, tasks, and expectations of performance to enhance the overall relevance of the assessment (Bachman & Palmer, 1996) as well as "the specificity (fine grain) of information included in the learning profiles of individual students" (p.58). From my review of the literature for

this dissertation I concluded that engineering education research overlooks the needs of international students at risk of failing the co-op component of their program.

2.12 Closing remarks

In this chapter I presented the relevant literature reviewed for this study and introduced the constructs that I will use to support my discussion of this research's findings in Chapter 5 and of this study's implications in Chapter 6. FEAS international students are potentially unprepared and unequipped to meet employers' expectations for work term placement. Drawing from existing literature, this chapter begins to identify the possible causes for such shortcomings that findings suggest are often overlooked or left unaddressed. Looking at the communication skills for co-op placement of international students through the lenses of the communicative approach in an intercultural perspective, potential gaps and deficiencies in this cohort's preparedness emerge. Furthermore, using the CEFR and the CLB frameworks as reference, significant improvements can be envisioned that harmonise with the existing FEAS curriculum and program so that foreign students' communicative and intercultural competence can be developed and their chances of success strengthened.

Chapter 3

Methodology

3.1 Introduction

The research employed the qualitative case study methodology to investigate how and to what extent the English language and intercultural competence of FEAS international engineering co-op students relates to their work term placement. Simply put, the "qualitative case study is an approach to research that facilitates exploration of a phenomenon within its context" and "ensures that the issue is not explored through one lens, but rather a variety of lenses which allows for multiple facets of the phenomenon to be revealed and understood" (Baxter & Jack, 2008, p. 544) As Yin (2009) contends, the research design can be defined as a logical plan that guides the researcher from the formulation of an initial set of questions to formulating answers and conclusions. Thus, section 3.2 below presents a review of the qualitative research methodology central to this study. Section 3.3 addresses the research problem and the questions behind the study, followed by a discussion of the qualitative case study (3.4) adopted here.

Although research that employs qualitative case study has the tendency to feature emergent designs whose focus may be altered by unexpected events or discoveries, an initial research design is necessary (Simons, 2009). This need is even more pertinent considering the traditional criticism brought against qualitative research, often described as "soft" research (Yin, 2009). To that end, the specific methodological decisions made in this research and the rationale that guided such decisions are discussed in the last four sections of this chapter, namely the sections dedicated to sampling and data collection

methods (3.5), data collection (3.6) and data analysis (3.7). A section (3.8) on the limitations of the qualitative case study as related to this research concludes this chapter.

3.2 Qualitative research methodology

Following the path of a number of recent qualitative studies that investigate the experience of international students (Gill, 2007; Koskinen & Tossavainen, 2004; Langley & Breese, 2005; Penington & Wildermuth, 2005), and breaking away from the tradition that sees quantitative methods as preferred by engineering education researchers (Case & Light, 2014; Johri & Olds, 2014), this study employed the qualitative research methodology situated within the interpretive research paradigm (Bassey, 1999; Johri, 2014). Despite Mason (2002) and Merriam (1998), among other authors' call for caution when addressing the quantitative-versus-qualitative dichotomy, this section briefly discusses the ontological and epistemological assumptions inherent in this paradigm. Recognising that the choice of methodology "presupposes a certain view of the world that in turn defines how a researcher selects a sample, collects data, analyzes data, and approaches issues of validity, reliability, and ethics" (Merriam, 1998, p.151), the section below is intended to explain the rationale behind the choice of the qualitative route to investigate the problem central to this research.

Unlike the positivist paradigm, which argues that "there is only one, fixed, agreed-upon reality" (Croker, 2009, p. 6), the interpretive paradigm emphasises the existence of subjective versions of reality (Bassey, 1999; Scotland, 2012). Accordingly, the interpretive researcher aims "to understand these multiple ways of looking at the world – a fascinating, and intriguing, challenge" (Croker, 2009, p. 7) and, through qualitative inquiry, to describe the research participants' understanding, or *emic*, of the phenomenon,

rather than the researcher's view, or *etic* (Merriam, 1998; Croker, 2009). Furthermore, by recognising their own role within the research process, qualitative researchers acknowledge the influence that their very presence may exert on participants' responses and overall behaviour, a phenomenon referred to as the observer effect (Denscombe, 2010) or "paradox" (Cowie, 2009, p. 177). By positioning themselves at the centre of both the processes of data collection and of interpretation (Merriam, 1998, Croker, 2009) the qualitative researcher is aware of and openly acknowledges the extent to which her own set of believes, experiences and worldview may affect the results (Croker, 2009).

In light of this, this research employed a qualitative, rather than quantitative, research methodology to address an "intellectual puzzle" (Mason, 2002, p. 18) in consideration of the fact that quantitative methods "simply cannot capture many of the complexities of language and culture learning" (Jackson, 2006, p. 135). Conversely, qualitative research, which has grown in popularity in the field of applied linguistics (Duff, 2008a) and is slowly gaining popularity also in the field of engineering education research (Borrego, Douglas, & Amelink, 2009; Case & Light, 2014) allows the researcher to "address a wider range of research questions" (Case & Light, 2014, p. 536) and conduct an in-depth and holistic investigation of phenomena in their natural settings (Merriam, 1998; Richards, 2003). This is considered instrumental for investigating the complex research problem at the centre of this research which I describe next.

3.3 Formulating this study's Research Questions

The aim of qualitative research, according to Mason (2002), is "producing social explanations, or addressing intellectual puzzles" (p. 173), whereby a puzzle can be understood to be either "an *issue* to be explored, or a *problem* to be tackled, or a

hypothesis to be tested" (Bassey, 1999, p. 66; emphasis original). A research issue, whether a problem or hypothesis, however, "is not directly knowable itself; it is articulat[ed] through the questions it generates" (Freeman, 2009, p. 28). According to Bassey (1999) those questions are "the engine which drive […] the train of enquiry" (p.67). to serve such a purpose, they should be not only explicit, but also researchable and intellectually worthwhile (Mason, 2002). Hence, the aim of the following section is to outline the problem, the puzzle, which prompted this study and the specific research questions it generated.

Cross-border student mobility, is an important feature of today's higher education landscape in Canada and worldwide. Despite being proven to be generally valuable and transformative for those students who choose to complete their postsecondary education abroad, the experience oftentimes poses unique language and intercultural challenges for which some students are unprepared (e.g. Engle & Engle, 2004; Freed, 1998; Gill, 2007; Jackson, 2006, 2011; Llanes & Muñoz, 2009; Rees & Klapper, 2007; Ruddock & Turner, 2007; Williams, 2005). For the students in this research, the challenge is represented by securing the mandatory co-op work term placements. It is embedded in the structure of the Bachelor of Engineering co-op only program at FEAS where this research was conducted. Yet it is made more pressing by the elusiveness and ambiguity that usually characterise recruiters' expectations and foreign students' little to no familiarity with communication in Canadian professional contexts. Considering the role played by language ability and intercultural competence as examined in this research, a student's approach to that challenge is worth investigating within the specific context of the support system provided within the faculty and the university.

Following their arrival, international students do not always make an effort to seek opportunities for communication with host culture members (Llanes & Muñoz, 2009) and do not "invest great amounts of out-of-class time in establishing contacts" (Allen & Herron, 2003, p. 382). Attempts to foster intercultural interaction within classroom settings are often hampered by communication difficulties (Sheridan, 2011). This can represent an obstacle to greater participation in classroom activities, inhibiting international students from establishing rapport and meaningful relationships with domestic students (Otten, 2003; Sheridan, 2011; Swaminathan & Alfred, 2001). To exacerbate this problem, international students may demonstrate "a disappointingly low level of perception of a need or an ability to help themselves"(Ife, 2000, p. 35). International students' failure to exploit the opportunities available to them is particularly problematic if one considers that lack of engagement in intercultural interaction with representatives of the host country may profoundly affect their development of English language competence (Jackson, 2006, pp. 148-149) and intercultural competence (Engle & Engle, 2004).

At the same time, contrary to expectations, the efficacy of efforts made by engineering faculties to create linguistically and culturally rich immersion environments aimed at facilitating socialisation between foreign and domestic students may be limited by the emergence of conflicts between the cohorts (Johri & Jesiek, 2014; Johri et al., 2014; Newstetter & Svinicki, 2014). An alternative option is to design and offer ad hoc initiatives tailored to the specific language and intercultural needs of the international cohort. As Brecht and Robinson (1995) report, international students in their study were of the opinion that formal instruction "focused out-of-class learning, activated passive

knowledge, aided in comprehension, and provided a forum for trouble-shooting out-of-class communication breakdowns" (p. 323). However, trends in engineering education research discussed in the previous chapter indicate that, increasingly, current practices are grounded on the assumption that English language proficiency and intercultural competence of international students develop spontaneously during the formative years. For example, Ife (2000) contends that, "[t]he assumption is that for the most part language learning will take place in naturalistic conditions rather than in the context of the language classroom" (p.30).

This research was prompted by concerns voiced by the university community regarding the possibility that FEAS was not adequately responding to the specific needs of its international student population. Namely, the conclusion that emerged from those observations was that the faculty was not providing adequate language and intercultural support to its international cohort to ensure co-op success. As a result, work term underperformance by foreign students was expected to persist. Against this backdrop, if one considers the projected increase in international enrolment at FEAS, this research that addresses language and intercultural competence of Memorial international engineering students for work term placement is highly relevant as it is timely and urgent. From this standpoint, four main research questions were developed:

1) To what degree do English language ability and intercultural competence affect the success of international engineering students in co-op work placements?

2) What constitutes adequate vs. inadequate competence in English language and in intercultural knowledge, attitude, and skills, in the context of work-term placement?
3) Do current formal and informal teaching practices and initiatives at the university and the faculty level address the needs of international engineering co-op students?
4) What changes will need to be implemented at a faculty, staff or curriculum level to ensure that sufficient support is provided to international engineering students? Specifically, how can the language and intercultural needs of the students be accommodated within existing resources (existing initiatives and courses) and constraints (time and money)?

3.4 The case study approach

In this section I discuss the key features of case study research as the method chosen to investigate the research questions listed in the previous section. As Merriam (1998) points out, case study is one of five most widely used types of qualitative research adopted in educational inquiries. It is equally popular among researchers engaged in applied linguistic research (Duff, 2008a; Hood, 2009; Richards, 2003). Nevertheless, questions surrounding "what constitutes a case study, how it differs from other forms of qualitative research, and when it is most appropriate to use" it (Merriam, 1998, p. 19) suggest that as a research method, case study still warrants further explanation and clarifications. It may be argued that the difficulties in clearly conceptualising this approach may originate in the literature and, more specifically, in the use researchers make of term 'case study' to indicate both the "process of investigating a case and the

report which is an outcome of such investigation" (Stake, 2000, p. 436), as well as the unit of analysis itself (Merriam, 1998, p. 34). Authors such as Hood (2009, p. 68) contend that, "[a] simple definition of case study is elusive", or, as it is described in Gerring (2007, p. 17) a "definitional morass", or again "a good example of a question easy to ask and difficult to answer" (Bassey, 1999, p. 22). The common confusion reflects the fact that case study is sometimes understood as a particular method rather than an overall research approach, an issue that merits more attention, and consequently will be addressed in this section.

The main intent in case study research is to understand the particular (Merriam, 1998; Bassey, 1999; Stake, 2000; Denscombe, 2010; Dyson & Genishi, 2005; Simons 2009). Hence, for Merriam (1998, pp.29-30), this approach is respectively "heuristic" and "particularistic" in nature (in addition to being "descriptive"). In relation to the issue of defining with some degree of clarity what constitutes a case, many authors agree that a case is a unit of study defined by its boundaries (Merriam, 1998; Bassey, 1999; Stake, 2000; Denscombe, 2003; Hood 2009), where the boundaries of the case refer to its spatial and temporal limits, as well as to what happens inside it (Cousin, 2005). Moreover, within its boundaries, a case is also defined as an "integrated system" of several interrelated parts (Stake, 2000, p.436). To depict the complexity of a case and the relationships between the different components involved, a case study adopts a holistic approach (Denscombe, 2010), which entail the analysis of the problem from multiple, sometimes contradictory, perspectives (Hood, 2009; Simons, 2009).

Since the process in which international engineering students engage to secure the mandatory work term placement bring together diverse cultural, educational, and

linguistic backgrounds of all the individuals involved in the process, a case study approach, with its emphasis on understanding the complexity of the singular as well as the multiplicity of participant's views, was therefore a natural methodological choice for this research. Moreover, a case is not studied in a vacuum, but rather it must be analysed in relation to its context (e.g. Yin, 2009). The reason why context is so important in this approach is that a phenomenon which is supposed to be illuminated through the study of a particular case is affected by a number of context-related factors such as the physical setting, as well as the larger sociocultural context (Dyson & Genishi, 2005). As far as the current study is concerned then, the phenomenon of intercultural language competence for work term placement may be understood differently in a foreign postsecondary institution where engineering students learn English as a foreign language than in an ESL program offered to international students at a Canadian university.

Consequently, Simons (2009) defines case study as "an in-depth exploration from multiple perspectives of the complexity and uniqueness of a particular project, policy, institution, programme or system in a 'real-life' context" (p.21). Other authors also emphasised the importance of placing a case in its naturalistic settings (Bassey, 1999; Cousin, 2005; Denscombe, 2010; Duff, 2008a). This means that the object of study has not been "tampered with" by the researcher, as it often happens in experimental research. Instead, the study aims to achieve so-called "ecological validity", that is "the ability to interpret the results in as natural a context as possible" (Duff, 2008, p.125). Therefore, Yin (2009) explicitly states that a case study is concerned with "a contemporary set of events over which the investigator has little or no control" (p.9). Finally, a case study report also employs thick description, understood as "the complete, literal description of

the incident or entity being investigated" (Merriam, 1998, pp.29-30). Such descriptive language allows readers to "vicariously experience what was observed and utilize their tacit knowledge in understanding its [the case's] significance" (Simons, 2009, p.23). This characteristic will prove crucial in evaluating the generalisability of the study, which I discuss in section 3.8.

3.5 Data sources

Section 3.2 introduced the problem that has prompted this study and which concerns the impact that inadequate language and intercultural competence has on work term placement and the need to international engineering students develop such competence. In this section the case selected to be investigate is introduced. As the literature indicates, the case study approach entails a two-stage sampling process, whereby the first stage entails the selection of the case to be targeted by the research, and the second stage entails the decision regarding what aspects of that case will comprise the research design (Merriam, 1998, pp. 64-65).

3.5.1 Case selection

Within the case study approach, the selection of the case on which to focus the inquiry is the result of the researcher's careful examination and consideration often conducted in light of established criteria of eligibility (e.g. Denscombe, 2010; Yin, 2009). However, as Stake (2000, p. 446) contends, the main criterion that should guide the case selection is the "opportunity to learn" that that case may represent. In line with this, a case is worthy of being researched provided it has the potential to offer the greatest degree of insight into both the case in question and some broader issue of interest. Accordingly, the case that was chosen for this research was deemed adequate on the basis of its potential to

increase our knowledge of the research problem and its related implications and to deepen our understanding of the issues surrounding the impact of poor language and intercultural competence on work term placement of international engineering students at Memorial University. Unarguably, to investigate the issue central to this study, it was crucial that the case selected would involve international undergraduate engineering students who would have to compete for work term placement within their first year of enrolment and succeed in securing several subsequent placements as required by the curriculum (5 or 6 work terms) in order to graduate.

In line with Duff's (2008 p.57) observation according to which "[qualitative case] studies do evolve from the investigator's original intentions for a variety of reasons", it is important to note that the original focus of the project changed as the study progressed. More specifically, the research focus was broadened from its initial emphasis on the role of English language ability and intercultural competence for work term procurement to include its effects on, what I call, on-the-job communication. The decision for this more equally distributed emphasis among all three stages of work term placement was reached following the realization that it would have allowed for a clearer understanding of the reasons behind the selection process and its implications for language and intercultural competence, and it would have brought to the forefront issues related to the responsibility of the students in the development of such competence. In short, it brought to the realization that it is the type and nature of the work term that differentiates requirements for language and intercultural competence of international engineering students, de facto adding a new layer of consideration to the issue of such cohort's preparedness for work term placement. Moreover, the inclusion of the 'on the job' component yielded a

considerably more complete picture of the problem and led towards an integrated framework for promoting the assessment and development of intercultural communicative competence of international students in co-op engineering programs. Accordingly, the redistribution of emphasis led to a refocusing of the literature review and the subsequent discovery that, while the literature addressed the needs of the employers for what concerns professional skills of new engineering graduates, still too little is known of the practical reasons that are behind those needs.

3.5.2 Description of the case

Memorial University of Newfoundland, where the research was conducted offers several undergraduate co-op programs which enrol a considerable number of international students. One of the most sought-after programs, especially by international students, is offered by the Faculty of Engineering and Applied Science. Students enrolled in the undergraduate engineering program at this university do not have the option of choosing a non-co-op program. Hence, they must complete the required number of work-terms, set at a minimum of four, in order to graduate. To facilitate all students' work-term placement, one mandatory professional development credit course is included in the curriculum (ENGI 200W).

Up until two years before the research took place, the university also offered a complementary non-mandatory professional development course in soft skills specifically designed for international students. This course was intended to address potential issues that might hinder the employability of international student candidate. To that end, one of the main objectives of this course was to improve international students' understanding of how to effectively communicate in an intercultural

workplace, to develop their critical skill sets (i.e. résumé writing, interview skills, communication skills etc.) and be more competitive and effective in their job strategies during the work-terms. A secondary goal of this course was to improve the students' command in the English language. Although securing the necessary work-terms remained a challenge for many international engineering students at this university, this course was cancelled following a governmental funding cut and no alternative solution has been offered since then, leaving the international students at the faculty of engineering with the option of consulting with co-op coordinators on an individual basis and access student services, outside their faculty, offered by the university.

Memorial University is at an important point in matters of international students' recruitment, enrolment, and retention (Knutson et al., 2014; Memorial University & Office of the Vice-President (Research), 2015; Philpott et al., 2014). International recruitment at the university level is expected to continue to grow (see Memorial University, 2001; Memorial University Office of the President, 2013) and the Faculty of Engineering and Applied Science has begun its ambitious national and international recruitment plan that will increase its undergraduate student body by 50% by 2020. Despite the persistent shortfall in co-op work-term recruitment, Memorial still endorses the same pre-admission requirements for foreign students enrolling in engineering as it does for other undergraduate programs. No pre- or post-admission assessment of intercultural competence is performed. As my 2012 pilot study showed (Fabretto, 2013), international engineering students find adopted teaching strategies and initiatives ineffectual and, most importantly, inadequate to the challenge of work term recruitment and placement. Against this backdrop, the case study for this research was designed and

conducted following the terms described in the next section, as approved by Memorial Interdisciplinary Committee on Ethics in Human Research (ICEHR) (see Appendix B).

3.5.3 Participants

I conducted semi-structured interviews with international engineering students, with industry representatives, namely recruiters and supervisors of international co-op students, and with key informants recruited among members of the university staff, such as co-op coordinators from the Faculty of Engineering, and staff employed in different capacities within student services. International students currently enrolled in the engineering program at Memorial were invited both by email and in person (see Appendix C). Participants from the industry, namely co-op students' recruiters and supervisors were invited through direct email contact with the Human Resources departments of companies recruiting in Newfoundland. Participants from the university, specifically co-op coordinators from the faculty of engineering and key informants from university staff were invited via email. Below the participants for each group, and related sub-group are profiled.

Group one. International engineering students. Five engineering students were interviewed for this research. The one female and four male, were originally from Mexico, Nigeria, India, South Korea, and Pakistan. Except for one participant, who was enrolled in Ocean and Naval Engineering, the students who participated to the interview studied Mechanical engineering. While no participants in this group participated in the pilot study (Fabretto, 2013), two of them partook in a similar study in which I was involved. Both were invited back for their unique insight on international students' work term placement shared during that study. In compliance with university ethic's rules on

research involving human participants, the identity of the five representatives from this group was kept confidential at all stages of research. To that end, and in consideration of the large number of international students enrolled in the engineering program, participants from this group were assigned the following pseudonyms: Anna, Bob, Charlie, Eric, David. In the next chapters, in which findings from their interviews are presented and discussed, these pseudonyms will be used.

Group two. Industry representatives: Recruiters. Three international engineering students' recruiters were interviewed for this study. One was a professional engineer while two were Human Resources specialists. All participants had a considerable experience with the process of recruiting undergraduate engineering students for work term placement. None received training relative to the recruitment of international candidates and no specific protocol for recruitment of foreign candidates was in place at the companies where they were employed. Each participant stated that the selection and recruitment process was the same for both Canadian and non- Canadian candidates. Participants from this group were assigned the following code names: Recruiter 1, Recruiter 2, Recruiter 3. In the next chapters, in which findings from their interviews are presented and discussed, these code names will be used.

Group two. Industry representatives: Supervisors. Two supervisors of work term engineering students agreed to participate in the study. Both participants had a considerable experience in supervising both Canadian and international co-op students. Additionally, one participant declared to often participate in the students' selection process as a member of the recruitment panel. To some extent, due to their role, the two supervisors interviewed offered complementary points of view on the importance of

communication skills in work term placement. As for the other participants, the identity of the representatives from this group was kept confidential at all stages of research. To that end, and in consideration of the relatively small number of individuals that would fit the profile detailed above, additional information that might lead to the identification of participants were omitted from this report. Participants from this group were assigned the following code names: Supervisor 1, Supervisor 2. In the next chapters, in which findings from their interviews are presented and discussed, these code names will be used.

Group three. University representatives: Co-op Coordinators. Three members of the Engineering faculty accepted the invitation to partake in the study. All three were co-op coordinators, a role specific to the engineering faculty that bridges that of faculty and staff. Most them graduated from Memorial University cooperative programme and built considerable professional experience before opting for an academic career. Their first-hand knowledge of the academic program, gathered from their experience as former students, and their expertise built through their work as professional engineers, form the basis for their academic role as it contributes to their unique understanding of the students' challenges associated with securing a work term placement. Participants from this group were invited because of their frequent interactions with international co-op students that are specifically related to communication and work term placements. Their identity was kept confidential at all stages of research and the following code names were assigned to them: Coordinator 1, Coordinator 2, Coordinator 3. In the next chapters, in which findings from their interviews are presented and discussed, these code names will be used.

Group three. University representatives: Staff members. Five university employees agreed to partake in this study. Here they are regarded as key informants due to their professional capacity as advisors to students either before or at the time this research took place. They neither belonged nor were they associated with the faculty of engineering. Rather, each participant was tasked with providing necessary career related guidance and hands-on support to all undergraduate students, not solely or specifically engineering students. To ensure the confidentiality of the participants any information that might lead to the identification of participants were omitted from this report. Participants from this group were assigned the following code names: Staff 1, Staff 2, Staff 3, Staff 4, Staff 5. In the next chapters, in which findings from their interviews are presented and discussed, these code names will be used.

3.6 The data collection process

The process of data collection in the case study approach may be defined as "eclectic" (Bassey, 1999, p. 69), because it allows for the use of multiple methods of data collection and multiple data sources (Cousin, 2005; Denscombe, 2010; Hood, 2009; Merriam, 1998; Simons, 2009; Yin, 2009), and "ways of collecting information in and from a particular setting" (Freeman, 2009, p. 32), to better serve the investigation of each particular case (Bassey, 1999; Hood, 2009; Simons, 2009). Unarguably, the flexibility represented by the variety of data collection methods employable in each research represents one of the strengths of the case study approach (Denscombe, 2010), the aim of which is "to gain the broadest and deepest possible view of the issue from different perspectives", and to render "both the complexity of the issue and apparently contradictory ways of viewing it" (Hood, 2009, p.81).

The term triangulation is used to indicate the employment of data collection methods that "required that data gathered in multiple ways (or from multiple sources) should corroborate – that is, the data should confirm one another" (Rallis & Rossman, 2009, p. 266). However, triangulation "is less concerned with confirmation or convergence […] but with exploring different perspectives and how they do or do not intersect in the particular context" (Simons, 2009, p.131). Research methods are often classified into three broad categories, i.e. interviewing, observation and documents (e.g. Bassey, 1999; Simons 2009), and qualitative case studies often employs all three methods (Merriam, 1998, p.134) with the purpose of gaining significant insight into the emic perspective of the interviewee, which does not lend itself to exploration through other methods such as observation or questionnaire. In the following section the data collection methods employed in this research will be detailed and the rationale behind their choice outlined.

3.6.1 Interviews.

Interviews are perhaps the most popular data generation method in educational qualitative research (Merriam, 1998, p. 70), while in the field of applied linguistics, they are no longer used solely for linguistic insights into various aspects of oral production, but also to elicit learners' perspectives on their experiences (Duff, 2008a). The literature highlights the many advantages that interviewing, particularly in its more loosely structured format, offers to the researcher, but it also clarify that this method is rather demanding as far as the researcher's role and responsibilities are concerned. According to Richards (2009, p.195) interviews are "easy to do but hard to do well".

For the purpose of the current study, semi-structured interviews were designed and adapted for each group. Interviews can be placed on a continuum from highly structured to unstructured, which reflect the degree of control and of consistency that the researcher holds over the sequence and the form of the questions asked (Merriam, 1998). The more structured among the interview formats can be best described as an oral questionnaire, where both the questions and the order in which they are presented to the participant remain constant among all participants. Conversely, unstructured interviews lack, by their very nature, any rigid script and they allow for a free-flowing conversation between interviewer and participant best suited for an exploratory approach to a research topic (Merriam, 1998; Richards, 2009).

In between the two types of interviews are the so called semi-structured interviews, which are perhaps the most commonly used in educational and applied linguistics research (Richards, 2009, p.196) for their ability to maintain sufficient comparability among differing perspectives while allowing for sufficient flexibility of inquiry into the topic that takes full advantage of the participant's perspective, insight and experience. In semi-structured interviews the researcher knows the issues that need to be addressed during an interview, and usually prepares and follow an "interview guide" in which these are clearly stated, although some flexibility about the content and flow of the discussion is considered acceptable, particularly when the participant offers some important, and unexpected, insight (Richards, 2003).

To collect the data for this research I conducted a total of 18 face-to-face individual semi-structured interviews with participants from the three groups, and related sub-groups, outlined above, who accepted my invitation and volunteered for the interviews.

Before recruiting participants, I prepared an interview protocol in which I outlined the steps I considered to be most important for establishing rapport with the participants and fostering a collaborative environment (e.g. by adopting a softer approach to the topic). The protocol comprised an interview guide outlining the questions that I wanted to cover, although, in line with the semi-structured nature of the interviews, I remained flexible about the exact wording of the questions and their sequence, which varied to a certain degree with each participant. Consequently, the natural flow of the conversation and the interviewee's engagement with certain topics, more than others, determined the depth in which some questions were explored. Analogously, the emergence of unanticipated issues or discussion topics not initially included in the list of questions, but found to be important for the purpose of the study, was further probed with additional questions.

At the end of each interview the participant was offered the opportunity to add any additional comment, question, or information. The interviews took place in several locations, both on and off campus to accommodate the preferences of the participants. With the participants' consent, all interviews were audio recorded to "ensure[…] accuracy of reportage and add[…] to the veracity of reporting" (Simons 2009 p.52) and the verifiability of the findings (Long, 2005b; Brown, 2011). This allowed for their subsequent transcription, which I did personally to ensure that the confidentiality of the participants was protected at every stage of the research, and to allow for the "intimate familiarity" with the data that the process ensures (Merriam, 1998, p.88).

How oral data are transcribed (e.g. the level of detail) depends on a number of factors, including the researcher's purpose and theoretical perspective (Duff, 2008a, p. 154). For example, less detailed transcriptions are recommended when the researcher is

not interested in linguistic aspects of an interviewee's speech (Duff, 2008a, pp. 154-155). Although I decided to fully transcribe all the recordings, since the focus was the content, rather than the linguistic form of participants' utterances, I decided to limit the amount of additional information in the transcripts to an absolute minimum. This is because incorporating unnecessary information (e.g. the exact length of pauses) in the transcriptions was considered to be of little benefit to the actual data analysis (Duff, 2008a, p. 155).

3.6.2 Documents.

Although documents are among the six most common data sources in case study research (Yin, 2009), in general their potential appears underestimated (Simons, 2009), despite the fact that they often represent a valuable "ready-made source of data easily accessible to the imaginative and resourceful investigator" (Merriam, 1998, p.112). In a case study, documents could either exist prior to data collection, or be produced in the course of an inquiry (Mason, 2002). Within the context of the current study some documents were analysed to contribute to the understanding of the case (Co-operative Education Office, 2016; FEAS, 2016; Spracklin-Reid & Fisher, 2013, 2014). These concerned mainly administrative and curriculum related documents, provided by participants from the co-op coordinators' group, as well as university-wide reports produced while the research took place and that addressed the issues of internationalization and vulnerability of international students at Memorial University (Knutson et al., 2014; Memorial University & Office of the Vice-President (Research), 2015; Philpott et al., 2014).

3.7 Ethics

Conducting research in an ethical manner is undoubtedly the primary responsibility of a researcher (Merriam, 1998; Rallis & Rossman, 2009; Yin, 2009). To ensure that ethical conduct in research is respected, universities, among which the one where this research took place, have appointed bodies in charge of revising the research proposal and the instrument for data collection, prior to issuing their consent. It is expected of every researcher that research participants are treated with respect, that their privacy, and in some cases anonymity, is protected, and that all the essential information regarding the research are provided to them to elicit their informed consent. Memorial Interdisciplinary Committee on Ethics in Human Research (ICEHR) approved this research and all the documents used prior to its commencement (see Appendix B). Each participant signed the "informed consent" prior to the beginning of each interview (see Appendix D). Also, each participant was informed of the option to withdraw from the interview at any time during the interview itself and within 48 hours from its completion. No participant opted to withdraw either during or after the interview.

Furthermore, all participants were assured of the confidentiality of the information they would provide, and assigned pseudonyms and numbers (e.g. Recruiter 1, Staff 5, listed above) to protect their privacy, as recommended in the literature (e.g. Simons 2009) at the moment of transcription. The only document that lists the full name of each participant and its correspondent code name and number (e.g. John Doe, Staff 1) is currently locked in my bank deposit box. All electronic correspondence between me and potential participants has been removed from the server and saved on a portable memory device, which was also locked in the same deposit box. To prevent any possible

identification, names of people and of companies used during the interview were not transcribed in the transcripts but substituted with a generic "[company name]". No information regarding any participant to this study, or regarding any person contacted for this study, who ultimately decided not to participate will ever be revealed.

3.8 Data analysis

The process of data analysis has been described in the literature as a process whose purpose is "to let the data 'speak'" (Richards, 2009, p.191). In a qualitative case study this process may become somehow challenging, as there appears to be relatively little guidance on how to approach it. Not only, according to Simons (2009), is "there […] no right way to do case study research" in general (p.7), but also, according to Hood (2009) there is no agreed-upon procedure for analysing qualitative case studies, even though, the process of data analysis in qualitative case studies often does not differ significantly from the process as conducted in other qualitative research traditions. However, it is worth noting that by the very nature of this research method, which emphasises "an intensive, holistic description and analysis of a single, bounded unit", the process of data analysis places particular emphasis on "[c]onveying an understanding of the case" (Merriam, 1998, p.193).

Considering this, when analysing a qualitative case study, the first concern of the researcher is the identification and organization of relevant information, as they pertain to the case and the aim of the inquiry (Merriam, 1998). Qualitative data analysis is a multi-phased, iterative process that entails several stages of coding from initial or open coding, through category creation, to further conceptual development (Richards, 2003). In line with "the interactive, recursive nature of data collection in a case study" (Merriam, 1998,

p.141) in some cases, an initial coding of the first interview(s) may be performed before the data from all the interviews are collected, as a way to elicit some initial information and further sharpen the questioning for subsequent interviews. Whether conducted with the purpose of better informing subsequent interviews, or as a stem in the data analysis protocol, the purpose of open or initial coding is to "to generate a set of labels from which categories can be derived" (Richards, 2003, p.273), followed by the development of categories as a means of bringing order and organisation to the initial codes (Richards, 2003).

In this study, the processes of initial coding and that of category development were, to some extent, simultaneous to the extent that tentative categories were created during the phase of initial coding. Following the completion of all interviews, a complete review of the coding process and the categories it yielded was performed. As a result, codes and categories were further refined, and subsequently organised around the broad themes as emerging from the analysis. To delve into a more detailed description of the data analysis employed for this research, it is worth noting that the data collected were coded using Constant Comparison Analysis (Glaser & Strauss, 1967). The perspective that underlined the analysis is defined in Brown (2011) with the term "Diagnostic" to indicate that focus is placed on "any language element or skills that would be harmful if missing" (p. 274), or what learners "need to know" (p. 274) in order to successfully function in the target L2. The transcripts were then content analysed to identify and elicit initial indicators of language ability (reading, writing, speaking, listening) and intercultural competence.

Specifically, inductive analysis was conducted on such data, to reduce possible bias/ interferences generated by "prior assumptions, theories, or hypotheses identified or

constructed by an investigator" (Thomas, 2006, p. 238). Following Robinson et al.'s (2005, 2007), the analysis was conducted "without preconceptions, allowing the indicators to "emerge" from the data" (2007, p.77) which were subsequently cross evaluated to identify both similarities and discrepancies (Brown, 2011) among various participant's input. Three major stages characterize the constant comparison analysis (Corbin & Strauss, 2008). During the first stage (i.e., open coding), the data were chunked into small units. To each of the units, I attached a descriptor, or code. During the second stage (i.e., axial coding), these codes were grouped into categories. Finally, in the third and final stage (i.e., selective coding), I developed three main themes that express the content of each of the groups (Corbin & Strauss, 2008; Onwuegbuzie, Slate, Leech, & Collins, 2009). In this research, the themes, intended as patterns of concern or areas for improvement, reflected either intercultural competence or communicative competence relevant to work term placement and each informed the discussion in Chapter 5 and the implications in Chapter 6.

3.9 Limitations

Within the traditional positivist paradigm, research has tended to be evaluated based on validity (both internal and external), reliability, and objectivity (Simons, 2009, p.127). However, in evaluating qualitative research studies the ontological and epistemological differences between the two paradigms should be taken into account (Merriam, 1998, p.200), particularly when rigour and the potential to make generalisations are discussed (Denscombe, 2010; Yin, 2009). While some authors opt for the use of traditional headings of internal /external validity and reliability (e.g. Merriam, 1998), others prefer to adopt different terms such as credibility, usefulness, and rigour (e.g. Rallis & Rossman,

2009). In this research both terminologies have been used to some extent, even though the distinct nature of the qualitative study has taken precedence. Below, the strategies I employed to ensure the quality of this research study are discussed.

The concept of internal validity, which is traditionally concerned with the issue of "how research findings match reality" (Merriam, 1998, p. 201), must be approached differently in qualitative than in quantitative research (Hamel, Dufour, & Fortin, 1993). A case study provides the readers with an adaptable prototype, transferable to similar situations and to the context most personally useful to them (see e.g. Eisner, 1991; Erickson, 1986; Shields, 2007; Stake, 2000, 2005). As discussed at the beginning of this chapter, the reason for such distinction is due to the fact that in qualitative research reality is viewed not as "a single, fixed, objective phenomenon waiting to be discovered, observed, and measured as in quantitative research" (Merriam, 1998, p. 202), but rather as subjective and multifaceted "people's constructions of reality" that reflect "how they understand the world" (Merriam, 1998, p. 203). Consequently, in order to decrease the risk of a researcher's misinterpretation of participants' (emic) perspectives, and at the same time increase the credibility of the findings (Rallis & Rossman, 2009) a number of strategies are employed. In this research, these include triangulation (primarily of data sources), peer review, through the discussion of the progress of inquiry and the findings with the primary supervisor, and by displaying my own reflexivity, intended as the decision I made to be transparent about my role in the research process (Bassey, 1999; Croker, 2009; Duff, 2008a; Hood, 2009; Merriam, 1998; Rallis & Rossman, 2009; Simons, 2009; Stake, 2000). They also include my willingness to acknowledge and address what Hood (2009) calls researcher's personal "blind spots" (p. 76) for their

potential effects on the process of collection, interpretation and reporting of data in qualitative research (Simons, 2009, p. 81). The acknowledgement of "blind spots" by qualitative researchers entails the acceptance that their "gender, age, ethnicity, cultural background, sexual orientation, politics, religious beliefs, and life experiences – their worldview – are the lens through which they see their research" (Croker, 2009, p. 11).

In this study, I opted for the inclusion of both interviews and documents as methods of data collection, and for input elicitation from participants from different groups and with different perspectives. Most importantly, my intent was to be fair to the students and their experiences, whether recounted by them or described in the words of others. I made great efforts to ensure that I would "let the data speak", in agreement with what Simons (2009) stated about the inextricable link between the act of being reflexive and being ethical in research.

According to Merriam (1998), striving to fulfil the criterion of reliability, as it is commonly understood in the positivist paradigm, by focusing on the replicability of research findings, in qualitative research "is not only fanciful but impossible" (p.206). By the definition of reliability provided by Yin (2009), the purpose of this criterion is to ensure that, "if a later investigator followed the same procedures as described by an earlier investigator and conducted the same case study all over again, the later investigator should arrive at the same findings and conclusions" (p.37). However, since in qualitative research the researcher's subjectivity is an integral part of inquiry process, the expectation that two different investigators may succeed in shaping the same research in exactly the same way appears unrealistic. Thus, in the context of qualitative research,

reliability is better describes as "whether an outsider would agree with your findings, given the data you have collected and written up" (Rallis & Rossman, 2009, p. 267).

Analogously, given the customary practice of selecting single cases for inquiry, evaluating external validity, or generalisability, is problematic in qualitative research and particularly in research that employs qualitative case study designs (Merriam, 1998, p.153). As Bassey (1999, p. 30) effectively explains, "[t]he familiar criticism facing case study researchers is 'How can you generalize when $n = 1$?'". Yet, some researchers contend that case study research has the potential, or even an obligation, to generalise (Dyson & Genishi, 2005). This is despite some authors' scepticism (Denscombe, 2010; Yin, 2009). Authors, such as Merriam (1998), have attempted some proposals (see pp. 208-211) that suggest that the concept of generalizability could indeed be made compatible with qualitative research studies. As a result, in Bassey (1999) introduced the concept of tentative, or "fuzzy generalisations", which "arise […] from studies of singularities and typically claim […] that it is possible, or likely, or unlikely that what was found in the singularity will be found in similar situations elsewhere" (p.12). Other authors, including Denscombe (2010) and Hood (2009), contend that it is indeed the similarities that may exist between the case study and other cases that make the conclusions and recommendations of the case study transferrable to other contexts. As such, findings from a case study could be generalised to other cases, provided they share key features (Denscombe, 2010; Hood 2009).

Considering this, the responsibility for drawing generalisations no longer rests with the researcher alone. Instead, it becomes a shared responsibility between the researcher and the readers who, by reading the description provided in the research study report can

draw commonalities and identify discrepancies between the research case and their own context, and ultimately make an informed judgement as to whether and to what extent the case study findings may be relevant to their own case (Denscombe, 2010).

As Merriam (1998, 2009) reminds us, every research design can be discussed in terms of its strengths and limitations, and its merits evaluated in relation to the research problem investigated and the questions being asked. I selected a case study design because I believe its strengths outweigh its limitations. It offered a means of investigating complex social units consisting of multiple variables of potential importance in understanding the phenomenon (Merriam, 2009). Anchored in real-life situations, this method is appealing for applied fields of study such as education in which processes, problems, and programs can be examined with the goal of improving practice and informing policy. Critics of this method, however, continue to raise several issues, some of which are worthy of further explanation. Below, I address the main critiques that can be moved to the use of the case study method in this research.

As discussed above, the main issues that often fault case studies are those of reliability, validity, generalizability of findings, and, compared with quantitative research, the lack of rigour in the collection and analysis of data (Hamel et al., 1993, p. 23). However, as Shields (Shields, 2007) points out qualitative case studies do not aim at achieving the " gold standard" of randomized controlled trials in educational research. It is a strength, rather than a limitation, that this method includes paradoxes. And, although this research used FEAS and, to some extent Memorial University, as research site, it is likely that the implications generated can be relevant to other engineering programs in the country and, perhaps, abroad.

With internationalisation typifying Canadian postsecondary education and with the accreditation system in place (CEAB, 2014; CAFCE, 2013a, 2013b, 2015), the likelihood of finding significant commonalities between FEAS and other Canadian Bachelor of Engineering co-op programs is quite high. Furthermore, there is also an important international aspect about the accreditation process that is worth considering. Canada is one of the 18 signatory countries of the Washington Accord (Hanrahan, 2011; International Engineering Alliance, 2013c, 2014a, 2014b), whereby participating states recognise each other's engineering programs as substantially equivalent in satisfying the academic requirements for the practice of the engineering profession (Engineers Canada, 2013, 2016). While these countries conform to common education standards in different ways, they all now include Graduate Attributes (e.g. GA:07, 'Communication Skills') amongst their accreditation criteria (Iaacson, 2016). For engineering faculties in countries like Australia or the United States, substantial international students' presence is a reality and the offering of co-op programs is common. Possible commonalities among challenges involving this cohort in such programs are also likely.

Second, this study focuses on the school-to-work term transition of international students and their ability to communicate effectively in professional settings. Accordingly, in conducting my analysis, I use the theoretical framework of communicative competence as conceptualised for L2 learners. However, incidental findings from this research suggest that a growing number of domestic students confront many of the work term-related issues and challenges believed to be unique to international ones. The relevance of this information is clear when one considers how this may affect international students involved in teamwork or other interactive situations in a

context of situated learning. It seems counterintuitive to expect domestic students to meet the same standards of competence as their international peers. However, in that regard, Celce-Murcia et al. (1995) make an important observation in introducing their pedagogically oriented model of communicative competence. They state that while their model was developed from a L2 perspective, a great deal of it is assumed to have validity for describing L1 (p. 7). Accordingly, when interpreting the remainder of this dissertation the reader may also consider the implications discussed here as relatable and pertinent to both domestic and international students.

One could argue that the small sample size of this study may limit the reader's confidence in the results. However, this sample size can be reconciled with other studies investigating similar problems (see e.g. Brunhaver et al., 2017 in Progress; Brunhaver et al., 2015). In fact, my study brought to light several important weak points that exist within FEAS pedagogical approach and practices. Importantly, without significant improvements, this study points to the need for more realistic expectations of international students' work term success. It generated insight on the type of support most needed by international students who struggle not only to access co-op placements but also to grow professionally while on the job. It also identified areas in which more research is needed. I will discuss some of the directions I view as most critical in the last chapter.

The student group consisted of students from various disciplines of engineering, included one female student, and was linguistically and culturally diverse. Important linguistic and cultural groups, Chinese and Middle Eastern students, are not represented here but were included in my pilot study (Fabretto, 2013). Also, small companies and

companies that operate only locally may have provided compelling comparative insight, as might companies operating in distinctly different sectors or markets. Particularly worth investigating would have been how their co-op demands and hiring expectations measure against the supply of international student candidates given the competition for talent that characterizes co-op student recruitment. Every industry representative interviewed stated that, because their company's workforce is highly diverse, hiring international co-op students is the norm. This hinges on whether they are effective communicators genuinely interested in working with the company. Unfortunately, no company without a diverse workforce and international connections accepted my invitation to participate in this study. This limited the possibility for alternative viewpoints in my analysis.

Critics of the case study method often question of how much one can truly learn from studying a single case, a single unit, a single instance. Questioned is the value found in context-specific versus generalised knowledge, considering that generalisation from one single case cannot add to scientific development. Flyvbjerg (2006) contends that the force of a single case is often underestimated. Indeed cost, time, and other constraints impinge on the depth, breath, and level of detail of a research, considering the targeted audience (Merriam, 2009). Likewise, the decision on the amount of description, analysis, or summary to be conducted rests with the researcher, as Stake (2005) points out. From this standpoint, case studies are limited by the sensitivity of the researcher as the primary instrument of data collection and analysis, according to Merriam (2009). In response to critics who contend that case studies are most useful early in a research to formulate generate hypotheses, Flyvbjerg argues that case studies are useful to both generate and

test hypotheses and beyond. Difficulties in summarising them into general propositions and theories are due to the properties of reality not the method.

Case study is an appealing design for applied fields of study in which processes, problems, and programs can be examined to improve understanding that can affect or improve practice. Accordingly, this method has been adopted in studies on educational innovations, evaluation of programs and informing policy. As discussed below, this research has generated several implications. These implications should be of interest to engineering educators, university decision makers, and students. Sections in this chapter also offer some valuable insight to Canadian policymakers tasked with formulating and implementing program accreditation and professional guidelines. Within the professional community, recruiters of international students and new graduates in the engineering sector may find this research informative for sharpening co-op hiring protocols. This study implications should not be considered conclusive or exhaustive. Instead, they are intended to stimulate thinking in stakeholders and researchers on the issues and challenges central to this dissertation and about multiple opportunities for optimising practice and advancing research that this study identified.

3.10 Closing remarks

In order to show that qualitative research "is anything but a soft option" (Richards, 2003 p.6), this chapter introduced the "intellectual puzzle" and listed the specific research questions behind this study, explained the rationale behind the researcher's choice of employing a qualitative case study research methodology to investigate them and detailed their step by step application. The chapter that follows will provide the detailed description of the research findings as they resulted from the data analysis process.

Chapter 4

Research Findings

4.1 Introduction

The following chapter presents a summary of the data collected for this research. As explained in the previous chapter, in order to gain a better perspective of the problem relevant to this study, three representative groups were identified and approached, namely international engineering co-op students, industry representatives, sub-grouped into recruiters of co-op and on- the-job supervisors co-op students', and university representatives, sub-grouped into engineering faculty co-op coordinators and university students' support staff. From these groups, a total of 18 participants volunteered to be interviewed by the researcher.

4.2 International engineering students

Five international undergraduate co-op students enrolled at Memorial University Faculty of Engineering and Applied Science, accepted to participate in this study. When asked to describe a work term placement, all participants explained that securing a work term placement entails the preparation of a cover letter and a résumé and, when called, conducting a job interview. There was shared awareness among participants regarding the challenges posed by the recruitment process. There was consensus on the importance of having a good command of the English language to secure a work term placement, intended as fluency both in what they described as "general language" and in "technical language". Additionally, as Eric pointed out, interpersonal communication skills, also in intercultural perspective are instrumental. For him, interpersonal skills were the weakness that posed the greatest challenge in securing work term placements. Among other barriers

to success, Bob observed that poor knowledge of the requirements for the job application and hiring process often has a negative impact. That includes the use of appropriate format, language, and terminology for the engineering field, which is an aspect of communication with which students must develop familiarity. Furthermore, spelling or grammatical mistakes are unacceptable. Students often fail to realise, Bob pointed out, that a recruiter may have less than 30 minutes to skim through 500 résumés and the cover letters. Job interviews may be quite challenging as students struggle to express themselves and articulate their answers. Understanding interview questions may be difficult to international students especially because of the recruiter's accent. For example, Anna recalled an interview where one of the recruiters, the HR representative, had a strong Newfoundland accent, which she found incomprehensible. In Anna's opinion, her inability to understand the questions negatively impacted the outcome of the recruitment interview.

4.2.1 Addressing work term success.

Although the response rate varies substantially from one student to another, every student normally applies to several jobs in hope of securing an interview. Bob considers submitting five résumés and cover letters and receiving three calls to an interview as the norm. David, however, submitted up to sixty applications in one round of recruitments, which yielded a total of five interviews and one job offer. At the time of the interview, David had completed two work terms but had failed to secure a placement during his second work term semester. Charlie also experienced some initial problems securing placements as first-year student. Ultimately, however, his revised application was successful and resulted in a work term position with a prestigious energy company. Eric

overcame initial difficulties with the help of a co-op coordinator and, at the time the interview took place, had secured five work terms. Based on his experience, Eric observed that sometimes international students do not have the communication abilities to get some of the more challenging and interesting jobs and are only hired for more technical jobs. In his case, striving to improve his language and intercultural skills resulted in him being hired for increasingly important roles, by significantly more important companies.

4.2.2 Discussing familiarity with tasks and context.

Eric found that international students tend to close up during an interview for fear of being judged negatively. This reaction is common among students who have had little previous experience communicating with professionals in general. Eric acknowledged that different educational traditions often underemphasize communication, especially if a student completes previous schooling in Asian countries like China or India. In his country of origin, a focus on career and professional performance dominates the culture. The curriculum does not usually include extracurricular activities, such as debates competitions or other communication building activities that are common in Canada. Furthermore, because many international students do not have any previous work experience, they lack experience in professional communication, particularly regarding colloquialisms and small talk.

4.2.3 International students' support.

In terms of accessing resources and support services, with the exception of Eric, all participants were dissatisfied with the help provided by the co-op coordinators, which was described as lacking continuity and consistency. Charlie contacted the faculty co-op

office which he found quite unhelpful, disorganised and unreliable. He also consulted Memorial CDEL (Career Development and Experiential Learning) student services and attended the Professional Skills Development Program (PSDP). Both are, in his opinion, overall helpful for international students but not for engineering students because not sufficiently specialised. He eventually decided to reformat his job application form based on a format he found online. Anna contacted the Chair of her discipline asking for help for both work terms. Anna stated that additional ESL training before entering engineering would have been helpful. Both Anna and David fall into the category on international students exempted from providing proof of English Proficiency upon enrolment because they completed high school in Canada. Particularly, Anna stated that her writing is still weak, especially the writing of technical reports.

Regarding peer-support, all participants except Anna declared that they received help from both domestic and international classmates. Anna, on the other hand, appeared to be particularly frustrated when she commented:

> "I don't know sometimes I feel like it's just the culture is so much different. We are more open to help people sometimes I think". Comparing her home country and Canada, Anna added that "if a new student was to come to my school from a different country I would be more like "you need help, can I help you" because you don't know what to do, you are in a new school you don't know anybody, you are in a class where you are going to be stuck for the rest of like 5 years and they don't try to help you …that frustrates me a lot … like everyone have their own group of friends".

4.2.4 Situated learning.

Anna described her Canadian classmates as indifferent and subtly aggressive. She recalled an event that took place during her first year when she was assigned to a team of three Canadian students to work on a course-related project. Reportedly, her teammates

initially simply ignored her and then openly excluded her from collaborating to the drafting of the report, which caused her to fail the course. Notably, the intervention of the instructor, to whom Anna asked for help, was inconsequential in changing the students' attitude.

The kind of experience students had during their work terms varied considerably. Contributing factors to the type and amount of communication that students engaged in during the performance of their co-op jobs, could be related more to the attention the hiring company gave to in-office interaction than to the position for which the student was hired. As such, students had different experiences as different companies hired them, albeit for similar jobs. The personality and degree of involvement of the student's work term supervisor, also greatly contributed to the student's experience in general. David's experience was negative particularly from an educational standpoint. His most recent work term was with a well renowned energy company and entailed data entry. When asked to provide an example of the workplace interaction he experienced, David pointed out that his supervisor still could not remember his name despite the fact that he worked in that position for three months. Daily interactions were limited to casual conversations with some classmates hired to work in the same department. His position prevented him from interacting with co-workers, except for one technician who would enjoy meeting students from time to time. Students in that office were not asked to prepare a presentation or write a report.

Conversely, Charlie had a positive experience. Charlie described his colleagues and supervisor as very supportive and ready to help in any way possible, and the work term as an opportunity to know about the workplace and further his understanding. Eric stated the

he had excellent supervisors. Both Eric and Charlie, as two among the most successful participants to the study, concurred on the fact that it is the responsibility of the student to take the initiative and develop a rapport with supervisor and co-workers. Oftentimes, they do understand that you are from a different country and maybe have difficulties communicating. During her placement, Anna struggled with technical jargon for which she received help from her coworkers. Terminology was a big problem for Charlie as well being assigned to the office of the drilling team of an offshore oil company. He recalled having weekly meetings and coffee breaks with a group of contractors working for the company. Drilling contractors are notorious in the industry for speaking using nearly exclusively acronyms. Unfamiliar with the terminology, Charlie initially felt excluded from the conversations. In response, he began to diligently annotate every unknown term and acronym in his log book, find its meaning and memorise it.

As any other work term student in that company Charlie was also asked to give a 10-minute presentation on the project on which he had been working during the term, for which he received extensive and positive feedback. He recalled that a student who worked with him during the work term received a less positive evaluation. Despite being academically brilliant, his supervisor emphasised the needed for him to improve his language, especially his accent, since he was incomprehensible. Eric recalled his remarkable experience of doing a work term in his own home country. He described that experience as remarkably different. Because he knew the company where he worked and, most importantly, he "was in [name of the country]" and was comfortable with the communication level, the level of information he had about the company's expected level of communication. Among the five participants to this study, only Charlie was offered to

return to the same company for the next work term. Four positions were made available to him. He chose one that entailed a different aspect of oil-related operation. At the time of the interview, he was thrilled to learn as much as he could during his next appointment.

4.2.5 Recommendations to international students and FEAS.

In closing the interview, I asked the students to reflect on their past work experience and give some advice to a hypothetical international engineering student. For Eric, as a senior student, highlighted the importance of balancing one's academic life, with professional life, and financial life. Interestingly, no student who participated in the interviews mentioned the social aspect of being university students. Only Eric advised international students to accept the fact that:

> "you are going to make mistakes, know that you are going to need help, know that someone along the line is going to call you an idiot, know that not everyone is going to be as accepting, that some people will like you some people will hate you, and that sometimes it will be because of the language not being able to communicate. And it is ok".

Anna's advice to a student would be to carefully ponder the choice of entering the program. Because she usually sends some money home to help her family, juggling school and work is a challenge for her. Charlie observed that a common mistake international students should be warned against is the tendency to focus "too much on marks and too little on jobs", since marks are not as important as many students may think for career success. Regarding work term placements, Bob said that every aspect of work, including volunteer experience, part time work has to be in place before competing. Analogously, every language-related problem needs to be addressed promptly by seeking help from the staff at the Centre for Career Development. When asked the

question as to what advice would they would give the university to increase the chances of international students finding co-op placements David responded with silence. After a very long pause, he suggested that the more cultural events should be organised specifically for international students. In answering the same question, Anna called upon the university to prepare students for the true challenges of the program. A better, more efficient line of communication could also inform students of initiatives of interest. Eric's recommendation to the university emphasized the need to provide international students with opportunities to interact with professionals in the engineering field by organising networking events and one-on-one sessions with professionals in the field during which the student can ask questions and can gain a better understanding of the job and of the company's expectations. Because that is not a job interview, during which the student's "career is on the line", these types of events offer a safer environment for students who would benefit from talking to someone who is knowledgeable.

4.3 Recruiters

Three work term recruiters of international engineering co-op students volunteered to participate in this study. When asked to describe their role as co-op recruiters, participants explained that their involvement is mainly confined to the two initial stages of selection, namely the review of written job applications such as the cover letter and the résumé as well as the one-on-one interview with shortlisted candidates. Two participants prepared the job posting, while all three were listed as the information contact person for the position. Only two participants, Recruiter 1 and Recruiter 2, had the opportunity to observe the work term students they hired in their day-to-day work. In addition to contributing with their own personal insight, during the research interview

recruiters shared some of the recruitment strategies and best practice adopted in their respective companies in matters of work term placement. Participants confirmed that rounds of hiring for co-op work terms take place at each academic semester but the number and type of positions advertised vary. For example, at the time the interviews took place, the company of Recruiter 1 employed only three work term students but was planning to hire six in the following semester. The company of Recruiter 2 had just hired 38 work term students for the upcoming semester, while Recruiter 3 had 20 engineering students working at the time and expected to maintain this number for the foreseeable future.

4.3.1 Addressing work term success.

There was consensus among the three participants on the apparent growth in number of applicants at each round of recruitment. Reportedly, on average, one company received 30 applications for six positions, while the other two companies received between ten and 60 applications for each student position. All participants agreed that the number of applications increased steadily in recent years due to both the rapid increase in FEAS enrollment and fluctuations in job availability. Also, companies' widespread practice to invite successful work term students to return for their next work term, is a contributing factor. For example, Recruiter 2 had recently hired 21 returning students of the 38 working at the time. For Recruiter 1 securing two "returning students" for the following semester eliminated their need to recruit.

As Recruiter 1 explained, recruiters look at work term students as potential new graduate hires. A company's junior employee tends to be a past work term student primarily because of their familiarity with the company's organization and culture. For

example, Recruiter 2 commented that, at the time the interview took place, her company had work term students who had done three work terms with the company and had just been hired under the company's "new-grad program" that grants new graduates permanent employment upon graduation. The "new-grad program" is a very coveted entry level program for which more than 100 students and new graduates compete for 15 jobs every year. Candidates are selected based on both their academic and professional performance as well as their ability to integrate well within the company, embrace its culture and its mission.

A good command of English is considered important at any stage of seniority within the program but it is considered essential for junior applicants. As Recruiter 2 put it, candidates who "are more senior students have more work experience". Their technical experience becomes as important as their communication skills. On the other hand, in the case of what she called "junior students, so students who are looking for their first work term", "strong communication skills" are what the recruiter expects. Each of the three stages that comprise a work term (i.e. job application, job interview, and the on-the- job stage) have been discussed during the interviews and the findings reported below to reflect the participants' expectations for each. Per all three participants, an international engineering student's language competence is a determining factor in that student's success at the job application, the job interview, and the on-the- job performance stage. Factors contributing to such success are the student's academic average, previous work experience, even in unrelated and part time jobs, and volunteer experience. When asked about whether some considerations are made for different traditions in different countries,

where students do not normally work and do not normally volunteer, two recruiters showed some flexibility while Recruiter 1 firmly stated her opinion by commenting that:

> unless "the kids are in school every day from 8:00 am to 5:00 pm and then they have 10 hours of homework or something, there should be some opportunity to contribute, to give back to the community, you know to show that you are responsible".

In general terms, it became quite clear that the expectations were that the student, whether domestic or international, had to fit what can be understood to be a pre-conceived profile of an ideal candidate. Unlike Recruiter 1, Recruiter 2 did not comment on the value of volunteer work or part time work of the candidate, and preferred to focus on the issue of international students' language proficiency. She observed that the quality of language and the formatting of a cover letter and résumé provides the first opportunity for screening. According to Recruiter 1, "you can see it from the résumé or the cover letter how strong English is for them". Every reason is a sufficient reason to reject an application. Acknowledging that students have access to faculty and staff within the university who are tasked with helping them prepare their work term job applications, Recruiter 2 explained that a grammatically correct and well formatted résumé and cover letter represent only the first step in the screening process of each application.

Recruiters expect applications to be "customized" to the position for which the student competes and written in such a way that conveys a student's passion and interest towards the position and the hiring company. Because employers and recruiters are not "just looking to fill a role" by recruiting work term students, understanding why candidates want a particular position, what they may find appealing in that position is key. As a result, a "cookie-cutter application", a "basic cover letter and résumé", albeit

grammatically correct and well formatted, is not likely to withstand the competition from an application by someone who has expressed a real genuine interest and appreciation for the job duties that the position entails. Thus, succeeding in differentiating oneself from other candidates, the majority of which are likely to be native English speakers, requires an international student to have what one participant defined as "big skills" when it comes to English in general and writing skills in particular. Written communication in résumé or cover letter is an important component particularly for one recruiter. Her company writes installation procedures for divers, therefore, "safety can be an issue if you write procedures for a diver who is at 120 meters below the sea". Considerable delays in the delivery of a job may ensue if a student with inadequate writing skills is hired for such position, as every piece of writing that the student produces undergo several stages of vetting before reaching the client.

Competition for work term placement is extremely tough. Accordingly, as a student needs to "pay a lot of attention on being able to sell yourself" on paper, to show "why you are a great fit". This is especially important since the adoption of online application systems has eliminated any opportunity for one-on-one interaction, any "personal connection" with an applicant hand-delivering a job application. Today, job applications are a "stack of résumés" in which every candidate risks being "seen as just a standard applicant". Shortlisted candidates are invited to a job interview. Usually work term interviews are conducted by two representatives of the company, one engineer who is knowledgeable of the sector and the tasks associated with the job, and one HR representative. Recruiter 1, who is a professional engineer, often conducts the interviews alone. From her descriptions, a profile of the ideal job interview candidate emerged. The

overall expectation is that the candidate should be able to converse with the recruiter fluently, and demonstrate to be a "well rounded individual" during the 15 to 20 minutes interview. Moreover, since only one interview is conducted for each work term position, job interviews are a "make it or break it" opportunity for a student to shine. The questions posed to each candidate vary based on the degree of seniority of the student, usually depending upon technical knowledge that may be required for each job. For junior candidates, the interview focuses primarily on non- technical abilities. Hence, the emphasis is on soft skills, and especially communication skills. Based on the experience of Recruiter 1, interviewers ask students about their strengths and weaknesses, about their ability to handle difficult situations and work under pressure, especially their ability to handle a sudden change in priorities. Additional topics include 'what they like the most about the engineering profession and what they like the least".

The degree of English competence expected of each candidate during the interview is contingent upon the specific requirements of the job. The company of Recruiter 1 offers both office jobs, in which the student "works in isolation" or in "small teams", and on-site jobs, where the students has to perform in a noisy and potentially hazardous industrial environment, characterised by constant verbal interaction, rapid exchange of instructions, in which being a more confident and outgoing speaker become a job requirement. Beyond the specifics of the position, however, all candidates are expected to show their enthusiasm for the opportunity to work at the company and in that particular position for which they applied. Candidates who are not "forthcoming", who are hesitant to contribute much to the conversation and just answer the question are found unconvincing. Analogously, candidates who seem to have no "clear objectives", who

cannot articulate their expectations and possible contribution to the position lack the necessary "requirements for success". A genuine interest in the position is critical to secure a placement and the candidate is expected to be "able to convey a genuine link to the company", a "genuine reason to work there", which entails a broad spectrum of knowledge about both the industry and the company.

Because "the interview process is to find out whether candidates identify with the company", demonstrating knowledge of the company activities in different sectors, including, for example, its community involvement or charity initiatives is important. Such knowledge should go beyond what is accessible on the company's website, where only publicly available information are provided. Instead, candidates are expected to research the company's culture and understand it. This background knowledge is essential for two main reasons. First, it should give an indication to the candidate of whether they would fit into the company and the job. Second, it would provide the grounds for "intelligent questions" that the candidate is expected to ask the recruiter during the interview. Students often overlook the importance of asking questions during an interview as a way to convey both interest and knowledge in either the company or the specific job. For Recruiter 2 in particular, not asking questions is a "deal breaker". Questions are also a key way for the student to gather valuable information about the job. According to Recruitment 3, students too often neglect to inquire about the geographical location of the job or its accessibility in addition to its requirements. To that end, a student should seek necessary background information by contacting other co-op students who completed a work term at the company, or by contacting the company directly before applying or before attending the interview.

4.3.2 International Students' Support.

Only two of the three recruiters who participated to the study have an opportunity to either interact or indirectly observe the students they recruit. Recruiter 3, who does not have this opportunity meets the co-op students at a "focus group" she organises at the end of each work term. All three participants stated their complete satisfaction with the candidates they selected. However, each of them recalled one single instance in which the candidate they hired did not perform as expected. In one case the degree of command of written English of the candidate did not meet the necessary requirement of the job. It caused delays in the completion of the task and required extensive proofreading. Another case involved two students whose negative attitude, constant complaining, and lack of initiative had a negative effect on the entire team. Students should take the initiative and voice their concerns regarding the tasks they are assigned and maintain an open line of communication with their direct supervisor considering that work term is primarily "a learning experience" that would benefit significantly from such interaction.

In one company students are tasked with preparing at least one presentation to be delivered to their team, or their division, towards the end of their work term for which the student receives accurate constructive feedback from every member of the audience. Feedback ranges from the quality of the language used on the slides and during the oral presentation, to mannerism and body language. According to the recruiter who consistently attends such presentations, the feedback is delivered directly to the student and is not included in the student's final work term evaluation report that is compiled for the university. All work term students attend a half-day "presentation preparedness" session in which the basic rules of effective presentations are addressed and discussed. In

addition to this recurrent task, and depending upon what the company is in a position to offer, students may be expected to partake in a variety of social activities during the course of their work term.

4.3.3 Situated learning.

Work term students are strongly encouraged to contribute to any of the numerous social events within the company, ranging from small in-office events, such as "take your kids to work day", to larger charity or quarterly meetings attended by hundreds of people. Work term students are expected to make a difference, be a team player, and get involved. According to the recruiter, this type of involvement and participation makes a student emerge and is often a determining factor in the company's decision to invite that student back for another work term and, in some cases, to hire that student permanently upon graduation.

4.3.4 Recommendations to international students and FEAS.

All recruiters were asked to provide some advice to international student candidates or to the university in matters of communication skills for work term placement. There was consensus among the participants on the need to increment training on the preparation of a job application and to provide students with more opportunities for practicing job interviews. Regarding interviews skills, students should know the type of questions they can expect, as well as the behaviour that they should have during an interview. Recruiter 2, suggested that students be guided in learning how to articulate an effective answer. Based on her experience, many students seem not to know the fundamental elements of a recruitment interview. Although international students seem to be better prepared than Canadian students at providing information about their

experience, their answers seem to be rehearsed and artificial. For example, FEAS could organise an event, similar to "Toast to Hire" that is currently offered, in which the roles are reversed and it is the students who interview the recruiters and not vice-versa. Recruiter 3, would like to interview students who have a basic knowledge about the province, its geography, and its institutions. As representative of a public company, this recruiter is often faced with the problem of explaining to sceptical international students, the difference between federal government of Canada and the provincial one, to which her company belongs.

4.4 Students' supervisors

Two supervisors of international engineering co-op students volunteered to participate in this study. To some extent, due to their role, the supervisors offered complementary points of view on the importance of communication skills in work term placement. Supervisor 1 explained that his role does not entail a lot of daily interaction with work term students. He, however, schedules regular meetings with them as well as with other employees during which the students' overall performance is addressed. Conversely, Supervisor 2 has an extensive experience following the students' day-to-day operations at the job site as well as the students' social integration with other co-workers at the company. The interviews revealed that a co-op student's language ability and intercultural competence are very important for the success of the work term. The three areas in which such importance is considered by both participants to be more significant are job performance, safety, and social integration. Accordingly, the findings below have been organised around these areas.

4.4.1 Addressing work term success.

Based on their experience, both supervisors declared to be quite satisfied with the job performance of the students that their respective companies hired. Students were found to be hard working, accurate, punctual, and efficient. All students accomplished their assigned tasks. Although almost all of them had one or more communication challenges, such difficulties did not have a detrimental effect on their performance. In some cases, "adjustments" were made and strategies were devised by the company's team to ensure that job instructions and performance expectations were clearly received and understood by the student. The following examples were shared to clarify this dynamic.

4.4.2 Discussing familiarity with task and context.

One supervisor recalled three distinct students he recently supervised. One student from Brazil, was described as very proficient in English and overall an effective communicator. This student could effortlessly conduct a conversation with the team, write an accurate report, and communicate via email. Another student, from China, could understand English well and could converse fluently. Unfortunately, a heavy accent required some effort on the team's part, to understand. Nevertheless, an efficient flow of communication was always assured. The Chinese student was also described as a gifted writer. A third student, from Vietnam, posed several communication challenges. He was chosen during the job interview for his technical knowledge despite his poor speaking skills. Because of his good writing skills, important communication were conducted exclusively in writing. Everyday conversations, however, were limited to a few words. Notably, the other contender for that job was a Newfoundlander. Recruiters described him as unable to communicate. Despite being a native English speaker, recruiters considered

the communication skills of the Newfoundland student unacceptable because his answers did not match the questions and he was incapable of establishing or maintaining any kind of dialogue with the recruiter.

The language barriers of the Chinese and the Vietnamese students did not prevent them from performing well on the job, suggesting that for the job for which they were hired, their language ability was sufficient, also considering the environment in which the student was expected to function. Supervisor 1 observed that working in the engineering industry one cannot expect to always work in a quiet environment. Whether the job is in a construction site or is it at sea, on a boat, environmental factors potentially affecting communication need to be considered against the language ability of the candidate. For example, the Vietnamese student just discussed would not have been a suitable candidate for some on-site jobs. Similarly, Supervisor 2 pointed out that if a computer programming position becomes available, the candidate should not be expected to function in a particularly noisy environment.

4.4.3 Situated learning.

Aside from the technical aspect of each job, in a professional environment there are several occasions in which professional interaction is expected. Attendance to the weekly meeting is a requirement for the team to which Supervisor 2 belongs. Purpose of the meeting is planning and review of the projects at hand. Work term students are expected to attend these meetings and are expected to interact. Oftentimes, depending on the student's personality, the team must engage the student by asking questions. As Supervisor 1 argued, the team can work with an introvert student but would not accept a student who does not engage or participate.

The association between language proficiency and workplace safety was a topic of great interest for both the supervisors who participated in this study. In any workplace, but especially in the engineering industry safety is paramount, stated Supervisor 1, who considers language barriers as a safety issue. To that end, from a supervisory standpoint, establishing the students' ability to understand instructions regarding how to correctly follow procedures is a priority, so that personal injuries accidents or damage to the equipment can be averted. Supervisor 2 explained that an international student's supervisor cannot simply assume that the student understood the instructions. The student must convince the supervisor that every aspect of a safety procedure has been correctly interpreted. For that reason, at the beginning of each work term, Supervisor 2 evaluates each student individually before deciding how to proceed and how much exposure to potentially hazardous tasks or equipment to allow. This preliminary evaluation is a well-established practice in the industry that customarily entails the delivery of technical explanations regarding a piece of equipment. They are conducted one-on-one facing one another in the supervisor's office.

Some students, however, fail to grasp simple concepts such as the reason they must wear a life jacket during a demonstration. The biggest problem, according to Supervisor 1, is that many students, and not only internationals, do not fully understand that being in a real-world situation is not like being in school. Because all students are young and often lack basic knowledge or common sense, trying to convey instructions in a language that is foreign to students so that they can truly understand the implications may be challenging. To aggravate this challenge is the realization that students are often afraid to ask questions and are genuinely surprised when Supervisor 2 reminds them that asking

question is the key to improving one's skills. Many students are afraid of showing their weaknesses even in an educational context such as a work term.

Workplace social integration was also discussed. Both companies to which the supervisors belong operate in an open-door environment, interaction and communication is the norm. Most international students close the office door as soon as they arrive. This type of behaviour is problematic not only from a professional point of view but also because it limits the opportunities for socialisation and integration of the student. According to Supervisor 1, some students integrate socially better than others. For example, the Chinese student mentioned above enjoyed socialising at work. He would sit around in the kitchen and discuss a variety of topics with his co-workers. While limited in speaking clearly enough to be always understood, that student could grasp the nuances and the innuendos of every conversation.

Supervisor 2 hired a Chinese work term student shortly before the research took place. Despite the supervisor's efforts to speak clearly and slowly, often repeating the sentence several times, proved unsuccessful. Simple greetings or sentences were left with no response. Apparently, that student would look up, say nothing, put his head down again and continue typing. Other students in the past were equally taciturn, even though many showed more motivation to communicate. Regarding the case of the Vietnamese student mentioned above, Supervisor 1 observed that because of the language barrier, the work term experience of that student must have been quite tiring, always struggling to communicate with colleagues. And while his poor ability to communicate did not impact the quality of his work, it impacted the team's ability to relate to him on a human level.

4.4.4 Recommendations to international students and FEAS.

Work term supervisors were asked to share their recommendations to a hypothetical international student and to the university. Both recommended that students practice communicating and interacting with Canadians and Newfoundlander in the university community. Supervisor 1 voiced his scepticism towards the reliability and validity of widely adopted standardized tests, such as TOEFL, to accurately attest a person's ability to communicate. Reflecting on his occasional role as admission committee member for the provincial association of professional engineers (PEGNL), he observed a simple score is regarded as sufficient proof that applicants can work as professional engineers in an English-speaking environment. As he explained, PEGNL foreign applicants are expected to simply tick the box stating that they obtained the required score on TOEFL. Because the PEGNL committee members do not meet the applicants, they cannot evaluate their true ability to communicate effectively. Relating to his experience as supervisor of international work term students, whose process of admission to the university is similar to that of an international engineer seeking PEGNL licensure, the supervisor concluded whether such tests should be re-evaluated. Discussing the test assessment of oral communication, the supervisor observed that the noise-free artificial environment coupled with the clear enunciation of the speaker may yield distorted test results. Considering this, international students and the university should be made aware of such potential limits of the assessment tools they adopt and compensate for possible lacunae by providing additional forms of assessment and appropriate training as needed.

The advice of Supervisor 2 focused on the need for the student to research the job for which they are applying. Key information should be gathered about the type of job for

which they compete, especially whether it is an office job versus an on-site job, the tasks that the job would entail and what would be expected of them as work term students. Information should regard the specific language skills and the overall level of English needed to meet such expectations. The purpose of such research would be to allow the students to make an informed decision regarding the skills that would be required as much as those that could be developed during that time. Students should understand that a work term is primarily a learning opportunity, and that learning is an important aspect of work term often overlooked by students, Supervisor 2 added. As a learning experience, students should approach each work term as an opportunity to emphasise the skills they acquired but also to build those skills that are either weak or missing. Lastly, the faculty should familiarise all students, but especially international students, with the language and the basic concepts of workplace safety early in the program and strive to foster a learning culture that value interaction.

4.5 Co-op Coordinators

Three co-op coordinators, at Memorial University Faculty of Engineering and Applied Science, accepted to participate in this study. Each semester co-op coordinators are tasked with several different instructional and administrative duties. Throughout the course of the semester they engage in team teaching the work term preparatory course (i.e. ENGI 200W), mandatory to all first-year students who are about to apply to their first work term. Among their non-instructional duties, the first task coordinators must complete at the very beginning of each term is the review of the evaluation report that each student receives from her or his supervisor at the end of the work term. The report comprises non- numerical “open evaluations” of the students’ overall performance and of

the student's performance as it specifically relates to communication. Upon reviewing the report, Coordinator 1 clarified, coordinators recommend the final grade for each student among three available options, which are "pass, fail or pass with distinction". Pass with distinction is awarded to those students who received an "outstanding" evaluation in both performance and communication. A "fail" evaluation results when a "fail grade is recorded to either element". A student obtaining a "marginal pass" or a "pass" in either or both elements receives a final "pass" grade. Final marks are then recorded in the student's academic transcripts, making them accessible to subsequent work term and post graduate recruiters.

The next task assigned to the coordinators is to assist those students who would apply to work terms during that semester; that is the writing of a résumé and cover letter and in the search and selection of available and suitable job opportunities. As a third duty, coordinators maintain an open line of communication with students who are on a work term either via email, or, in some cases, in person. Additionally, all three coordinators interviewed declared to be actively engaged in the search and selection suitable potential employers who could offer work term opportunities to co-op students in the future. Striving to increase the number of job opportunities available to students is an important step that co-ordinators take towards mitigating what is believed to be a particularly competitive environment for all students but especially international students.

A high number of jobs suitable to accommodate all levels of students' seniority are needed at each semester. Coordinator 1 explained that once the students are in their discipline, after completing the first year or Engineering One, they rotate from academic term to work term each semester until graduation. During an academic semester the

student attends academic courses while searching, applying, and competing for work term jobs. Because the interviews took place during the Fall semester, Coordinator 1 explained that at that time students in Academic Term 3 were looking to go into their first work term during the upcoming winter semester, and some of them have yet to secure a placement. The perception that coordinators have of the hiring companies, especially larger companies, is that work term students have become part of the recruiting strategy. Consequently, the HR personnel appointed to the selection process knows exactly what knowledge and attributes the potential successful candidate must have. Different individuals will have different skills sets, different characteristics and also different degrees of maturity to be either a good candidate for an office or an on-site job. In the case of international students, it is the opinion of Coordinator 2 that interviewers are patient and tolerant, giving some students the benefit of the doubt, understanding that potential communication challenges. In the coordinator's opinion, if these students understand the question correctly and are able to respond in a way that is appropriate to the question they will find a job.

4.5.1 Addressing work term success.

There is unanimous consensus among coordinators that communication skills are essential to secure a work term placement. They are described as the deciding factor because in a professional environment verbal communication, such as understanding of instruction for example, is very important. Communication skills are most critical in junior work terms. For this reason, they are one of the key skills that are promoted in the early stages of the program. At that stage technical skills are still insufficient to meet the technical needs of a hiring company. Because of this temporary lacuna at a junior work

term level the importance of a student's communication skills, organizational skills, and interpersonal skills is emphasized.

For a student, the first work term is the foundation for future work terms. Once a student has established a record of accomplishment, securing subsequent work terms becomes much easier, even if the student's communication is sub-par. That student has earned a job reference, which is something that many international students do not have unless they have any previous work experience, in either retail or customer service, or they have volunteered before. As students proceed into the program, and acquire more technical skills and more experience, then the importance of communication skills becomes relative to that student's technical skills. Failing to secure a work term has a significant impact on a junior student at an academic, professional, personal, and financial level.

The academic consequences are the direct result of the way the program is structured. If a student is unable to maintain a consistent level of work performance or falls "too many work terms behind", that student is not allowed to proceed into a subsequent academic term. That student, labeled as "critical", would then need to take as much time as necessary to try and get a work term before proceeding to the next academic term. The status of critical accompanies the student for the duration of the program. Of the six work terms in the program, a student must complete four in order to graduate. Such a setback can delay graduation by a year. From the professional standpoint, a no-hire generates a gap in the student's résumé for each of the four months during which the student did not work. Considering the competition that exists for work terms any such gap has the potential to affect future job competitions. Furthermore, as Coordinator 1

explained, the classmates of a student who fail to secure a placement continue to advance in the program. Those friends represent a student's best support network as well as the core of one's competition. Therefore, to be the only one in a group of friends who did not secure a job would mean to "become the pariah", or at least "think of yourself that way", with significant social implications. Lastly, since a work term often represents an important source of income to be spent on living expenses and tuition, a no-hire may have serious financial implications.

Participants from this group were invited to elaborate on what, in their opinion, comprises communication skills and their impact on a student's hiring chances. According to Coordinator 2, a student's writing must be adequate to produce a cover letter that is free of grammatical error that really expresses fully what you want to express. Likewise, oral skills must be adequate to perform well in an interview, that is to convey one's history and the willingness to work. Failing to accomplish both in a way that is suitable to the interviewer would likely result in a no-hire. Listening, intended as being an active listener, must be sufficient to bring the student to understand what the person is asking them and follow up with additional questions if necessary.

According to Coordinator 3, patterns of performance can be observed in the students' language ability as resulting from the student's educational background. Differences are so noticeable that a coordinator can easily identify the exact country of origin after only a few minutes of conversation. Students who completed high school in countries that one coordinator describes as being part of the former "British Empire" stand apart from those who attended secondary education institutions in which the study of English is not a priority. As expected, students who had their education in English and

as part of a British curriculum perform much better than those students who did not. Conversely, no similar patterns can be observed in matters of intercultural competence, which has been found to be very low for all international students. When asked to elaborate on the communication skills for work term placement, Coordinator 2 stated that language, grammar, format, culture, appropriate wording, only appropriate information, understanding and speaking and understanding structure, writing and technical writing, are all equally important. According to Coordinator 3, no pattern was observable in matters of which of the four skills international students find to be the most challenging, however, it is quite common for a student to be stronger in one skill. It is not uncommon to meet students who can converse fluently but have great difficulties writing a job application. Students who did not receive a British education, however, are often weak in both written and oral communication. Those students represent the biggest challenge for the coordinators who must bring the student to function in English within the four-month timeframe.

4.5.2 Discussing familiarity with task and context.

Co-op coordinators are tasked with providing students with continuous support in the job search process. A database of job postings provided by the employers is accessible to all students, every semester. Students have also the options to search for jobs independently, outside the database, using LinkedIn or Workopolis, or by relying on personal networks. Whether through database or alternative avenues, all work term jobs require the submission of a résumé and cover letter by the student candidate. The most common issues that arise in the writing of a cover letter and résumé range for common grammatical or spelling errors to poor choice of vocabulary. It must be noted that many

international students write very well and construct sentences well. In those cases, oftentimes, the choice of inappropriate vocabulary for the context is still quite common. This problem is more common when students try to customise the cover letter to better fit jobs and hiring companies. Instead of customizing their cover letter in terms of company's operations or the specifics of the position, students often modify it superficially at the level of vocabulary.

Along the same line, Coordinator 3 stated that, at times, feedback, and instructions on how to improve the quality of the job application are ineffective because the students would not know how to translate good advice into action. Lack of knowledge of common rules and norms used in Canada to write cover letters and résumés is also problematic. For example, some students include in their applications information about their nationality, age, marital status, religion, or a picture, unaware that such statements would put the recruiter in a compromising position, making either their hiring or their no-hiring problematic. Conversely, relevant information, including skills developed in previous employment or volunteer activities, are often omitted because considered not transferrable and hence irrelevant to an engineering job application. As a problem, this is widespread among students whose cultural background dictates that it is inappropriate to identify or emphasize one's strengths and accomplishments. As a result, many cover letters and résumé are very vague and superficial. For example, a student may describe previous employment experience omitting key details that would indicate the achievement of a certain skill level of technical ability. At the same time, students from some cultures, for example in Asia, may be too enthusiastic about the job, which may

appear to the recruiter as insincere. Some of these students would use "flowery language", inappropriate for an engineering position.

Miscommunication on the job oftentimes entails the misunderstanding of instructions, expectations, and roles. There was consensus among the coordinators on the fact that a student's English language proficiency should be adequate to ensure the correct understanding of job-task related instructions and of instructions related to safety. Depending on the job for which the student is hired, adequacy may imply conducting a productive exchange of information and instructions with team-mates and co-workers in an office environment, or receiving and imparting instructions and information in a noisy, fast-paced environment on the job-site. Aside from extreme cases, a student's ability to fully understand instructions is key. An area of weakness of international students is represented by the lack of understanding of the extent to which expectations and roles change when one moves from an academic to a professional context.

4.5.3 International students' support.

Regarding post-enrolment training, the coordinators, and the faculty, have tried different approaches in the past. At the time the interviews took place, the faculty offered only one seminar course to both international and domestic students, the ENGI 200W introductory mandatory course, which enrols approximately 300 students. Given its structure, the course cannot address the specific challenges of international cohort. Furthermore, for the ENGI 200W students, language and communication skills are considered a requirement upon enrolment and not an outcome. In the past, an ad hoc non-credit mandatory seminar on soft skills provided international students provided international students with dedicated support. Common challenges addressed in the

course included the preparation of résumé and cover letter, interview techniques and job search strategies. Unfortunately, the course was discontinued following funding cuts. Having difficulties securing work term placement, is not a problem exclusive to international students and it is not a prerogative of all international students. Many international students do succeed despite the challenges. However, ensuring their success is the responsibility of the university as well as of the faculty. It should reflect the international recruitment efforts and the high tuition fees international students pay.

4.5.4 Recommendations to international students and FEAS.

Each coordinator had one key piece of advice to give a hypothetical future student. Coordinator 3 observed that many incoming international students already have a friend or somebody they know already at the university, who have been or are going through the program. Future students are strongly encouraged to leverage such a valuable resource and contact such person to gain a better understanding of the challenges that a co-op component pose to students with poor language abilities. Peer-to-peer advice has been found to be very effective, according to the coordinator. In informing future students, emphasis should be put on the fact that a co-op program has different requirements from an academic one. In a co-op programme, students are expected to do a lot more than just being academically brilliant and working hard. While students should be encouraged to attend the programme, they should be cautioned and, perhaps, advised to opt for an academic-only program.

According to Coordinator 2, international students need to familiarise themselves with the Canadian and Newfoundland culture and the university before beginning their first semester. They should also be made aware of the possibility that their Canadian

classmates may show a certain degree of indifference towards them and that this attitude can affect their collaborative classroom activities. In response, however, international students should avoid being afraid to voice their opinion or feel intimidated. If they are self-conscious about their language, students should work to overcome their lack of language confidence and learn to express their ideas strongly instead of adopting a "wait and listen approach". From a practical standpoint, incoming international students should engage in volunteer work and find a part time job immediately upon arrival, as both are very important résumé builder, sought after by recruiters, Coordinator 1 observed. Moreover, in a co-op engineering program success in securing work term placement has little to do with technical skills nor it relies heavily on academic achievement. High performance students, whose marks reach the 90s, respond to a no-hire by studying harder and raising their grades instead of dedicating more effort on improving their communication skills.

All coordinators were asked to offer some recommendations to either their faculty, or the university, on how to address, and hopefully resolve the problem of international engineering students and work term placement. In matters of language proficiency and intercultural competence, the two main areas the coordinators consider problematic are the standardized tests adopted for pre-enrolment language assessment, and the insufficiency of post-enrolment communication training. A better mechanism for vetting international students' true language ability needs to be identified, according to all three coordinators. In their opinion, while the widely adopted standardized test TOEFL could suffice in the assessment of English for admissions in academic only engineering programs it proves inadequate to assess students for the challenges of the co-op

component. Furthermore, achieving a good score in TOEFL, is perceived by the students as a precursor of success. Coordinator 3 observed that students who score high in TOEFL are prone to have a certain expectation of success, making TOEFL a contributing factor in a student's lack of motivation.

4.6 University staff

Five members of the university staff were interviewed for this study. As it happened with the other participants to this study, interviewees from this group were asked to explain their role and the extent to which that role put them in a position to contribute to this research. Staff 1 stated that in her role she sees students for their career needs, including résumé and cover letter, as well as network skills and communication skills. The development of networking skills and communication skills in preparation for career fairs and co-op competitions is the main job of Staff 2. Staff 3 focuses on résumés and cover letter writing. The two more senior participants, Staff 4 and Staff 5, built a considerable experience with international students, and their role is primarily the development of university-wide student services.

4.6.1 Addressing work term success.

There was consensus among participants from this group on the fact that international engineering students represent only a small percentage of the students that access their services and they do so to improve their chances of securing a co-op placement. According to Staff 5, one possible reason for this dearth of international engineering students may be that this cohort prefer to contact their co-op coordinators and do not think of contacting university staff. In the past, Staff 5 was made aware of the problem of engineering co-op students by the faculty of engineering, which was

struggling to place students. A group of students was unable to reach the job interview stage and were at risk of becoming critical. The group was rather substantial and comprised only Chinese students. There was no record of any of those students having contacted student services. She speculated that likely those students were expecting the faculty to solve the problem on their behalf. Following that initial contact, Staff 5 did not receive any further information about the group. Students sometimes fail to realise that the co-op component is mandatory and that they are expected to take the initiative in seeking help if needed.

Students need to understand that the employer understandably wants to hire the best employees and may not be comfortable hiring a student who has obvious issues in second language or problems fitting in the culture. Communication skills were considered very important by all participants in this group. Whether a student is hired and becomes part of a company depend on how well that student can communicate. The employers' perspective is discussed by Staff 2 as follows:

> "I talk to employers and when we talk about soft skills they really focus on communication, and that is written and verbal". She then clarified by saying that rather than skills, employers "talk more about competencies now and communication is up there" because communication are essential to "develop and maintain relationships with people", which is a crucial aspect in the work place. As such, "communication is key for employment and it is unfortunate that international students who come over are not prepared for that".

As Staff 5 observed, one could contend that North American employers are quite rigid as in terms of what they expect from their employees. Employers do expect employees to fit and avoid time-consuming and costly training sessions or having to deal with unhappy teams. This is especially true in the case of temporary employment.

Therefore, it is crucial that students learn to communicate effectively before they approach a job competition.

4.6.2 Discussing familiarity with task and context.

When asked to define what comprises communication skills in international students, participants from this group were, at least to some extent, in agreement in considering both language and intercultural competence as equally important. Language ability contributes only in part to the success of communication. Culture, on the other hand, form the core of communication. It is common to see students fail job competitions exclusively for intercultural breakdowns. However, in most cases, improving poor language ability is a priority for the students who access the Staff members. Recalling some of the cases she worked on, Staff 2 admitted to wonder:

> "how they got though these doors because their communication are, their English is so off" to the point that she would have to resort to "use hands and signals just to try to communicate". "How can you expect him to get his résumé ready when you are basically pointing (with the finger) things to him to try and show him what things are because the verbal is not there and the written is not there". Especially "considering how competitive the engineering program is", and "being dropped in a foreign country at such a young age", for some students the experience is one of "total culture shock" aggravated by the fact that they "can't communicate with anyone and in any each way".

In reviewing résumés and cover letters, grammar and spelling mistakes are the most common issues, followed by coherence and register, which tends to be quite informal. Along with grammatical mistakes, every participant in this group experienced having to educate students on the Canadian HR guidelines that prohibit applicants from including a personal picture, date of birth, and marital status. Another problem in terms of content of both résumé and cover letter relate to the student's struggle with effectively

conveying the value of skills acquired through previous employment or volunteer experiences. In an example, Staff 3, reported her challenge of explaining to international students how a part time job at a fast food would be a relevant and important item to include in a résumé because it likely contributed to a student's improvement of valuable skills, including customer service and conflict management.

At a university level, the instructors of the Professional Skills Development Program (PSDP) are regarded as the experts in terms of training international students for job interviews. Specifically, they conduct mock interviews with students who are preparing for their first round of interviews for co-op. Therefore, Staff 4 explained, students from engineering co-op or business co-op often seek their assistance. Staff 4 was among the team of experts who designed the PSDP and taught some of its components for several years. Regarding job interviews one of the main challenges she encountered entails teaching international students the language that they need to use to describe themselves during a recruitment interview. For example, when working with students she often delved into the meaning of words like "team-player", which, as she clarified, could both mean someone who can "lead a team" or be one of the "members of a team". When asked whether in her career she ever encountered a student whose skills were not adequate for a job interview, Staff 4 admitted that she did meet a few first-year students who were really struggling. Most students would avoid providing details or valuable information and refrain from elaborating for fear of making mistakes. Unfortunately, in a recruitment setting, these students could come across as if they lacked the depth of knowledge to bring to the situation. No participant from this group assisted individual students in practicing their on-the- job communication. Staff 1 have been offering group

sessions of intercultural communication in the workplace and presentation skills to students enrolled in the PSDP.

4.6.3 Situated learning.

The advice to international students from this group of participants focused on the tendency of students to self-segregate with peers with similar cultural background and avoid interaction with domestic students. The importance of reaching out to the community outside the university to gain greater familiarity with the local custom and language was emphasised. Co-op placements are important but socializing outside of the restricted academic or professional environment can be extremely rewarding. Volunteering could offer enriching opportunities that would also function as résumé building. While striving to enhance their social competence and overall peer integration, students are strongly advised not to overlook matters of professional development. It was a common opinion among participants from this group that students are recommended to seek help and access the services that the university offers. These services can provide a short-term solution to the problem of work term placement. But they can also add long term value to a five-year undergraduate experience. Ideally, first-year students would attend the PSDP, or access any other career-related service available. This would give students sufficient time to absorb the volume of knowledge and truly understand the industry they will enter after graduation.

Apart from Staff 5, all participants described the international students as keen to learn and very eager to make improvements and do well in this market. They are described as determined to do whatever it takes to improve their language and to keep building on their skills. Staff 5, on the other hand, sees international students as

demotivated and uninterested in developing language and intercultural competence. Some educational backgrounds hinder some students from understanding the need to study English and from fully engaging in learning the language. From this perspective, perhaps making a training initiative mandatory would ensure participation.

4.6.4 Recommendations to international students and FEAS.

The university is already providing a great amount of support to international students. Per Staff 1, among the services still missing are mandatory preparatory courses linking culture, communication, and language. Staff 4 found that an area of improvement that the university level should consider entails the provision of very dedicated resources for students enrolled in few faculties, including engineering. In addition to having discipline-specific knowledge and capabilities, dedicated staff would have sufficient allotted time to dedicate to each student. There was consensus among all participants from this group on the need to design initiatives that are tailored on the needs of this cohort. Furthermore, Staff 5 emphasized the importance for these initiatives to be structured. Some form of integrated help on which students can rely during their Engineering One for example would likely be successful and taken advantage of by students.

As a cost-conscious alternative, or as an additional activity, Staff 4 suggested implementing some form of peer-to-peer initiative. For example, senior students with work term experience could represent a great resource. In their tutoring role as recruiters, senior students could give their junior peers valuable advice and feedback. At the same time, they would gain some experience practicing being the employer or the interviewer and build the completely different skills set these roles entail. Another option discussed

during the interviews was the introduction of one or two transition semesters as a requirement for some or all international engineering students admitted to the undergraduate engineering program. Purpose of such transition semester(s) would be to give students sufficient time to improve their command of English and their intercultural competence, perhaps volunteer or find a part-time job, while free from academic responsibilities. Despite its unquestionable benefits, Staff 5 observed that students at such a young age might not be able to fully grasp the potential long-term value of such an initiative. While it would be an excellent opportunity, students would likely choose another program in Canada where the transition year is not a requirement.

Lastly, university standardized tests of English language were discussed (i.e. TOEFL, IELTS, etc.). As participants from this group indicated, current assessment practices and tools for evaluating international students' English needed to be revisited. A program-specific assessment of entry-level language could assist the faculty in identifying students needing additional training. Such an assessment would be of value to the students who may need a reason to access the student support services available. In sum, what really makes an international student successful is the crucial, still unanswered, question worth asking. Drawing from her experience as an educator, Staff 5 affirmed that "not everybody is cut out to be an international student", even though many "may romanticise it" and "maybe parents are dreaming about it". It takes a lot of emotional resilience, maturity, and motivation to succeed in a second language context. From the university or faculty perspective, she concluded, key is to consider the fact that some students "don't make good language learners and don't make good international students".

Chapter 5

Discussion

5.1 Introduction

When I launched my invitation to FEAS international students I had no way of knowing who would respond. As it turned out, all the students I interviewed in my study, and indeed in my 2012 pilot study (Fabretto, 2013), succeeded in securing at least one work term placement. Therefore, had my research focused on whether international students do complete the professional requirement of the program I would have reached the conclusion that they do. Frankly, in that case, I would likely have used a descriptive statistical instrument to investigate that question and surveyed the FEAS international cohort. Alternatively, I could have consulted FEAS directly, asking about students who failed to complete the program because of unmet requirements in the co-op component, or about students flagged as 'critical' because they were unable to complete the four mandatory work terms prior to their last academic term (Co-operative Education Office, 2016, p. vii). Instead, my interest converged on why some international students succeed, while others fail. And since it appeared that, proportionally, more international students than domestic ones were stumbling, I naturally turned to communicative and intercultural competence as potential key determinants of success.

While none of the students who volunteered for the interview entered the stage of being 'critical', their individual journeys to work term success differed significantly from one another. Their experience contributed to uncovering what success really means in terms of work term placement from a student's standpoint. I came to realize that co-op

success from the faculty's perspective pertains to ensuring that students find work term employment. Achieving that goal is a responsibility of the faculty as co-operative education provider (CAFCE). Being enrolled in a co-op only program, students experience constant pressure to find a work term, and most of them feel successful when they do. By investigating success, the first two questions guiding this research yielded results that confirmed that poor communication is a key factor in recruitment. But findings also revealed a more subtle, yet crucial link between a candidate's quality of communication (Spitzberg, 1989) and co-op placement: The better communicator a student is, the greater the likelihood that an enriching and stimulating opportunity will follow.

In this regard, the effectiveness of the pedagogical approach adopted by a faculty becomes even more critical. Findings substantiate the call for significant improvements in how FEAS prepares international students for the transition to co-op employment, specifically concerning communication. Findings from the third research question indicate that many international candidates fall short of meeting recruiter and employer's expectations because they are ill-prepared. Accordingly, much of the discussion that follows is based on an analysis of students' shortfall versus recruiters' standards from a pedagogical perspective. Finally, the fourth question asked participants about ways in which support provided to international engineering students may be strengthened and improved. I weighed the viability of their suggestions against FEAS current pedagogical strategies and concluded that some would have entailed a complete overhaul of the faculty's pedagogical paradigm. Allocating resources to exclusively train the international cohort in work place communication would be inconsistent with the notion of educating

maturing prospective engineers and the premise on which it rests. I opted instead for seeking viable alternatives that harmonise with established tenets. Below I discuss the three main points warranting attention that emerged from the cross-analysis of the five groups' interview transcripts.

5.2 Unmatched understanding of workplace communication skills

The first point of discussion regards the widespread apprehension among students toward the placement process stemming from uncertainty about what to expect and how to best prepare for it. Some students are stuck on the problem of securing work term placements to satisfy the professional component of the program (Co-operative Education Office, 2016, p. 11) and confused by the significant lack of clarity and direction they receive from FEAS. Students feel that the faculty does not provide them with the concrete support necessary to ensure their success. Recruiters concur. In this chapter I continue to elaborate on how work place placement and the communication underpinning it is conceptualized at faculty level and presented to students. The overall objective of this section is to begin making sense of the data and contribute to the correct understanding of the challenges of the problem of students' shortfall in recruitment at FEAS.

5.2.1 Disparities in understanding workplace communication.

From the moment all FEAS undergraduate students begin their program they know that the co-op component is a requirement and are constantly reminded of the importance of securing a placement following the completion of Engineering One. To that end, students attend a seminar (ENGI 200W) and are provided with the Engineering Student Co-op Handbook (Co-operative Education Office, 2016) explaining the stages and requirements of work term placement from admission to graduation. Most students seek

help from the co-op coordinators appointed to support them in the process. Yet, many students feel ill-prepared to face the challenge because they do not know what to expect. As reported by recruiters, those who stumble do so because they seem not to know what they are doing. I re-examined the body of information provided to students and concluded that those who struggle with uncertainty likely do not fully grasp the concept of context as it relates to language use in real-life situations (Gumperz, 1968, 1982, 2003). In other words, while FEAS information emphasises the elements of work term process, it under-emphasises the change in context that work term entails. This is a crucial point, to which I will return often in this chapter (CCLB, 2015c; Council of Europe, 2014b).

Literature concerning the benefits associated with co-op education rests on the premise that, during a work term, the student develops hands on experience and becomes familiar with the professional environment *outside* academia (Schuurman et al., 2005; Pinelli & Hall, 2012; Pons, 2012). FEAS grey literature also highlights the benefits that experiencing the professional world, outside of academia, may bring. But I argue that it falls short in highlighting the implications that transitioning to the outside world likely has for how students' communication competence is evaluated. Accordingly, confusion ensues when students attempt to apply the same criteria that supported them in their academic success to a context that functions based on vastly different criteria. Therefore, while students are amply informed of the components that comprise the work term placement, they are uninformed of the criteria for success underpinning them. These are the fundamental criteria that should guide every student, but especially international ones, in preparing for a successful work term competition. Discrepancies between what is

presented to them versus what is expected of them skews students' perception of priorities.

The literature tells us that international students with weak English proficiency struggle to be competitive in a cultural context different from theirs (Anant, 2010; Banerjee, 2009; Molinsky, 2007, 2010; Munley, 2011; Rajini, 2009; Vandermeeren, 2005; Vinay, 2009). In Canada, and around the world, employers today emphasise the importance of assessing soft skills before hiring a candidate (Gillen, 2009; Kantrowitz, 2005; Kovach, 2009; Rao, 2009; Sethi & Seth, 2009). Performance during the recruitment process, particularly at the interview stage, is important (Bardia, 2010; Kahn, 2010). International students are particularly vulnerable at this juncture (Eyre, 2011; Javidan et al., 2010). Therefore, international students should be adequately and, most importantly, explicitly informed of the underlying criteria governing each step of the selection process and of the importance of performance to increase one's chances of success. Because they will be evaluated on it and that evaluation will have significant implications, international students do not simply need to know about work term placement, they need to understand it, and to correctly acknowledge communication as a core competence affecting co-op success.

5.2.2 Importance of on-the-job communication in co-op placement.

Most likely because of this research focus, conceptualizing success in work term to me revolves around the assessment of students' communicative competence. Namely, I view work term as a context-specific, high-stakes summative assessment of the ability of the student to communicate effectively and appropriately in a professional co-op context. It is high-stakes because the outcome determines whether a student will proceed along the

program on schedule or will suffer delays. It is high-stakes also because it will determine whether that student will have access to opportunities for learning and overall professional growth that a good work term can provide. I consider it summative in that its goal is the evaluation of what a student learned–or, more appropriately, acquired– up to that point against criteria, standards, or benchmarks set by the employer. This represents a simple pass/ fail grade to recruiters. As Chen argues (2008), assessing and addressing the needs of immigrant populations in terms of second language fluency is a fundamental step in the process of integration of immigrants into society and the workforce: "English as a Second Language (ESL) proficiency poses a huge hurdle in their interaction with various circumstances and people in the new environment" (p.5).

Poor language ability may negatively impact "a non-native English speaker's endeavour in seeking and maintaining employment" (Chen, 2008, p.6) in several ways. It interferes with immigrants' ability to learn various aspects of the life in the host country, especially information that is essential for access to labour market, employment, and additional training opportunities (Chen, 2008). In the workplace, effective communication plays a pivotal role in the creation of opportunities for social interaction (Anant, 2010; Chamberlin-Quinlisk, 2010). Holmes (2000a, 2005, 2002, 2011) contends that an adequate display of politeness in the execution of daily professional exchanges and everyday conversations, small talk, and humour can have a big impact on how an immigrant is perceived by colleagues. Work term supervisors interviewed in this study reported several examples of co-op international students who were very competent in their work but lacked language ability and social skills to fully integrate in the workplace.

It is from this standpoint that I discuss the need for greater clarity and direction in the preparation of students to work term that emerged from my data.

5.2.3 Issues with on-campus workplace communication training.

Findings showed that the concept of competence in work term communication is ambiguous and that such ambiguity acts as a deterrent to students' preparation for competition. I had no issue conversing with all the students who participated in my study, yet all of them had encountered some difficulties securing a job. In the field of Human Resources, the concept of competence and expertise is fundamental, as companies have long realised that their employees are a company's competitive advantage (Herling, 2000). The term competence suggests that an employee has an ability to do something satisfactorily–not necessarily outstandingly– but rather to a level of acceptable performance. Conversely, an expert is someone who has the knowledge and experience to meet and often exceed the requirements of performing a task (Jacobs & Washington, 2003, p. 351). But while what Jacob and Washington call "exemplary performance" is an easily recognizable indicator of expertise, quantifying competence is still an unmet need.

Among the students I interviewed, I did not meet any student whose competence in communication was exemplary, but I met one student whose professional success was remarkable. During my conversation with Charlie, it quickly became apparent that for him being a competent communicator was a requirement of the job. Charlie struggled at first with securing a job, because the first applications he submitted resulted in no calls for an interview. When he was hired, however, Charlie took advantage of every opportunity his position provided him, to improve as a communicator to better fit the job requirements. He had lunch with contractors to learn how to communicate with them.

During the day, he took notes of terms and acronyms that he was not familiar with and, subsequently, found their definition. He established a rapport with his supervisor to learn as much as possible about the expectations the company would have of someone in his position. At the end of the work term, Charlie was invited to come back for his next work term and was offered a choice among several positions within the company.

Eric also understood the value of competence in communication for professional success early in the program. But his journey was not completed in a single work term. It required the timeframe of all four required work terms. His steady improvement and growth as a communicator brought Eric from being a struggling first-year student to being hired by a prestigious company to collaborate in an important project. Looking back at the time when he could not get a call for a recruitment interview, Eric described himself as committed to address his weaknesses and achieve his goal. Under the guidance of one co-op coordinator, he worked on strengthening his competence until he succeeded in securing the first job. He continued to do so till all the co-op requirements were completed and he was approved to graduate.

At the time of my interviews, both Anna and David had completed two work terms. In respect of the program, Anna was on schedule while David was slightly delayed, having missed one round of competition. Anna and David are the students who called into question the lack of clear direction from the faculty discussed in this section. While the conversation with David was somehow difficult, Anna's command of the language was so good that hearing about her struggle to find a job came as a surprise. Reportedly, both work terms Anna had completed were the result of help she received from the Head of her department, whom she contacted after failing several competitions. David, on the other

hand, did not reach out for help. He responded to the challenge by applying to virtually any job posting for which he academically qualified, sending out up to 60 applications per round, while reaping meagre results. Reportedly, David's strenuous effort had only produced two placements that he described as professionally unfulfilling and educationally valueless. David was resentful of the faculty for not equipping students with the necessary means to secure a job.

5.2.4 Inconsistent support for students' progress.

The diverging trajectories of successful and unsuccessful students summarised above corroborate an important observation made by one of the participants from the Staff Group (i.e. Staff 5). After elaborating on what international students should do to increase their chances of success, the participant in question concluded that not everyone makes for a "good international student". Despite the support made available by the faculty or the university, and considering the option of turning that support into a mandatory requirement, she argued that some students simply do not learn. While the possible explanations for this may be several, all point at the students' overall poor understanding of the co-op component that lack of clarification from the faculty exacerbates. Broadly put, findings from this study strongly corroborate the argument that international students undervalue the importance that their performance has to their success in work terms. Therefore, some international students fall short in appreciating the need to augment their communication skills and competence to match industry demands. Many international students seem to operate under the assumption that the level of language ability they achieved by the time they entered the program is sufficient to get them through the program.

As Philpott et al. (2014) argue, students seldom recognise this until "too late" (p.26). In some cases, that is until they realise that they need to work on their communication skills if they want to secure a placement, like Charlie and Eric. In other cases, as for David, they persevere and suffer the consequences. While it would be difficult to argue that Charlie and Eric fit the profile of the "good international student", it is David's experience that I find particularly significant. Namely, I wondered why many students like David do not behave like Charlie and Eric. In other words, in reviewing the interview transcripts I asked myself why Charlie and Eric were the exception and not the norm and why David, who labelled himself as the "worse-case scenario", was not the worst co-op that coordinators or representatives of student support staff had ever met. As I address the issue of students' preparedness in more detail later in this chapter, here I focus on how the faculty's failing to explicitly address it contributes to the perseverance of the problem.

The Engineering Student Co-op Handbook (2016), dictates that "the University does NOT guarantee placement, and securing a work term position is the student's responsibility" (p.18, emphasis original). According to Eric, however, no international student has either the time or the determination to actually read the 100 pages of the Handbook. The co-op coordinators I interviewed concurred that since the ENGI 200W introductory seminar became the only course addressing work terms, topics relevant to international students were removed. Accordingly, one co-op coordinator recommended international students find relevant information and guidance by identifying a friend in the program. Furthermore, one recruiter observed that she met very few first-year students during the career-development events organised by the faculty. First-year students are

tasked with completing foundation courses whereby the academic component of the program is prioritized over the development of other skills. As some authors argue (Sheppard et al., 2008) putting theory before practice allows little opportunity for students to avail of the kind of deep learning experience that mirrors professional practice. Thus, the gap between skills demanded and skills possessed by students widens (Borrego & Bernhard, 2011).

As Berman and Cheng (2010) argue, international students struggle especially at the beginning of their academic study and particularly if they are non-native English speakers. Insufficient language ability and lack of familiarity with different teaching and learning traditions exacerbate their struggle (Gu & Maley, 2008; Gu et al., 2010; Yeh & Inose, 2003). As Eric emphasised during the interview, many international students come from countries where students do not normally work or volunteer. In that respect, they are significantly disadvantaged compared to Canadian students for whom finding and maintaining a part-time job is the norm. In addition to being unaccustomed to the type of communication used in recruitment protocols, unfamiliarity with the entire recruitment process would make it particularly difficult to comprehend why the effectiveness and appropriateness of their communication would be relevant to the employer (Gillen, 2009; Kantrowitz, 2005; Kovach, 2009; Sethi & Seth, 2009). Concepts like product quality and rework costs (Jacobs & Washington, 2003; Rao, 2009) would be foreign to them. For these reasons FEAS should explicitly address how communication relates to students' professional success, explaining that it allows them to function and perform successfully in the workplace (Chakraborty, 2009a, 2009b; McGahern, 2009; Sharma et al., 2009).

5.2.5 Closing remarks.

Success in a co-op program requires a much higher level of competence than a traditional academic engineering program. For this reason, international students who succeed academically, sometimes fail professionally. I argue that FEAS overlooks the potential implications that lack of clarity and explicit direction on such a critical point have for new international students. Furthermore, in line with Philpott et al. (2014), findings confirm that ambiguity persists during the first year of the program. As a result, international students are often unaware of potential lacunae in their preparation until it is too late (p.26). To address this, in the next section I discuss instances where international students' performance was found to be particularly unsatisfactory.

5.3 The need for greater structure

The second point that emerged from the findings suggests the need for greater structure in the way students' ability to communicate effectively in a work term setting is approached and understood at faculty level, as well as by the students. Most of the data discussed in this section results from my second research question that asks how international students fail to meet language and communication requirements of work term placement. That question was designed to identify, in more detail, the current state of work term communication of international students, by focusing on students' weaknesses and deficiencies. Each participant provided valuable insight that proved instrumental to my understanding of the communication demands and challenges students struggle to overcome.

I aim to bring some clarity to nebulous and ambiguous descriptions of students' communication skills in the engineering literature and at FEAS. Hence, this section

focuses on industry standards of professional communication expected of FEAS students as they emerged from the findings. In conducting my analysis of interview data, I draw on on the conceptual framework of 'communicative competence' (Canale & Swain, 1980; Bachman, 1990; Celce-Murcia et al., 1995; Bachman & Palmer, 2010). I use their constructs to emphasise the multidimensional nature of communication and to interpret the findings from the perspective of FEAS students' deficiencies (see Spracklin-Reid & Fisher, 2013). In the general literature, the term 'communicative competence' has been equated to 'language ability' (CCLB, 2015, p.13). In the CLB theoretical framework the use of the term 'language ability' follows Bachman and Palmer (2010), who indicated that their work "builds on the notion of communicative competence" (p.57) of many previous authors such as Hymes (1972) and Canale and Swain (1980). In my discussion, I use both 'communicative competence' and 'language ability'.

I rely primarily on the description of language ability in the Canadian Language Benchmarks (CLB) and the Common European Framework of Reference for Languages (CEFR) to view recruiters and employers' language expectations of the FEAS students. Both CLB and CEFR are internationally accredited scales of English language ability widely adopted worldwide and currently used in Canada as framework of reference and source of common standards/criteria (CCLB, 2013a, 2015a, 2016a; Council of Europe, 2001, 2014b; Council of Ministers of Education Canada, 2010; Macdonald & Vandergrift, 2007; Vandergrift, 2015). I chose CLB and CEFR in my research because of their strong theoretical underpinning and because they meet the requirements for rigor, structure and versatility dictated by the problem central to this dissertation. Using '*Can Do* descriptors' of observable language behaviour CLB/CEFR aid in establishing 'how

well' the student can perform each *language task*. I define language task using the definition provided in the CLB theoretical framework (CCLB, 2015c). Briefly put, a language task encapsulates what the student is expected to be able to do with the language when confronted with authentic communication (p.15). Accordingly, achieving increasingly complex tasks in progressively unfamiliar and demanding contexts marks the student's progress at specified points (benchmarks) along the hypothetical continuum of language ability (see CCLB, 2015, p.13).

Lastly, drawing from the data I address intercultural competence as articulated by Deardorff (2004, 2006, 2011, 2012). Building on Bennett (2008, 2003, 1997) I argue that intercultural competence is instrumental for FEAS international student success in the program on many levels. Yet it is perhaps the most overlooked weakness in their preparedness. I argue that intercultural competence is a key factor in international students' academic and professional success (Alazzi & Chiodo, 2006; Barratt & Huba, 1994; DeCapua & Arbor, 2004; Gebhard, 2012; Green & Dixon, 2008; International Engineering Alliance, 2013b; Lee, Kang, & Yum, 2005; NAE, 2005). However, the picture that emerges from this study is also one of unpredictable interactions between international and domestic students at FEAS. This emphasises the need to address intercultural competence development of domestic students in the program. Considering current and forecasted changes in student demographics (FEAS, 2016), I collocate my discussion on intercultural competence in relation to the specifics of FEAS program. However, I also incorporate some considerations relevant to the development and implementation of effective pan-university internationalisation strategies (Fortuijn, 2002;

Ife, 2000; Knutson et al., 2014; Otten, 2003; Philpott et al., 2014; Spencer-Oatey & Dauber, 2015).

The main objective of this section is to establish an initial base on which a more comprehensive set of benchmarks of desirable international students' communicative competence for work term placement can be developed. I recognise that the relatively small number of participants to this research constitutes a limitation. However, I intend this section to provide engineering educators with some initial actionable information on which work-term related learning outcomes of engineering education can be developed (Frank, 2015). In 2010, the Canadian Engineering Accreditation Board, switched from the traditional input-based assessment of Graduate Attributes to the outcome-based evaluation of engineering programs in Canada (Spracklin-Reid & Fisher, 2013). Learning outcomes for communication and other fundamental skills are still being developed (Frank et al., 2015; Kaupp et al., 2014). In this section, I suggest a way in which engineering educators can begin developing learning outcomes for professional communication drawing on the experience of co-op international students. To that end, within FEAS as well as other co-op programs in Canada, this section can inform the development and implementation of effective outcome-based competence building practices, which I will discuss in the last section of this chapter.

5.3.1 Putting work term communication into perspective.

Central to my research question are the real-life professional communication scenarios in which students may find themselves in a work term setting. This is in line with the CLB (2015) theoretical framework which also adopts a situational approach to language use. It further reinforces the argument I introduced at the beginning of the

preceding section, whereby communicating in a language involves using the language in accordance to its context of use. Bachman and Palmer (1996, 2010), whose theoretical models underpin the way communicative language ability is conceptualized in CLB, define the term language ability as consisting of two main components. First, language knowledge, previously defined as language competence (Bachman, 1990). Second, strategic competence that allows the learner to implement that knowledge in language use (Bachman & Palmer 2010, p. 57). Strategic competence, articulated in other models including Canale and Swain (1980) is presented in Bachman and Palmer (2010) as a meta-cognitive component which ensures performance management (CCLB, 2015c, p. 18). By focusing on the learner's ability to accomplish communication tasks, CLB provides a description of the progressing ability to accomplish increasingly demanding communication tasks (p.45).

Co-op students are exposed to a variety of situations that are unique to this component of the program. The recruitment and selection process is consistent across the entire spectrum of the possible employment options. Conversely, there is great variety among the situations that students may find themselves communicating while on the job. From the interviews with recruiters and supervisors, I learned that the role for which the student is hired is not the only factor that influences recruitment expectations of student's communication. There are companies that consider activities that are not directly job-related to be equally valuable. For example, in the company of one of the recruiters interviewed, the active contribution of the work term student in corporate social and charity events is a requirement. From office family events to corporate fundraisers, how well the student participate will determine whether that student will receive a call back for

the next work term. To that end, companies that appreciate this social aspect of the job, will reflect that appreciation in the evaluation of a candidate's ability to communicate during recruitment.

At the same time, a student's language ability must meet the expectations of the professional role and of the company in which that student aspires to work if hiring is to ensue. Comparing the account of David's work term experience with that of Charlie, it becomes apparent that while Charlie's placement was extremely more engaging and stimulating, it was also significantly more demanding of his language ability. In executing his job, David was not expected to interact with anybody except for his fellow international work term colleagues. Likewise, David's position did not require him to write documents or to present a project in front of an audience. Charlie, on the other hand, worked every day in close contact with a project team and with contractors. During his time with the company he was expected to actively contribute to the office 'bring your family to work' event, as well as the annual stakeholders' gala evening. Towards the end of his work term, Charlie presented to the entire office division the results of the project on which he worked during his three-month placement.

The educational value of a work term must be collocated from this perspective. One of the main reasons behind David's frustration was that he viewed his experience as educationally valueless. On the other hand, Charlie was thrilled at the idea of learning something different during his next work term in the same company. It was not the in-house training Charlie received on how to make effective PowerPoint presentations that made the difference. Charlie, unlike David, by working in that company and in that role, was immersed in a learning environment that was conducive to learning (Fuller & Unwin,

2003; Hodgkinson Williams, Slay, & Siebörger, 2008; Wagenaar & Hulsebosch, 2008). He was placed in a work environment organised to be a "learning community" (Wenger et al., 2002) where situated learning (Lave & Wenger, 1991) can take place and where opportunities to employ and develop professional communication abound (Allcorn & Godkin, 2008; Nielsen, 2008; Yandell & Turvey, 2007; Zimitat, 2007)

Work-terms are supposed to facilitate acquisition of professional skills (Colby & Sullivan, 2008). By placing the student in the context of the profession, the expectation is that the student will acquire the skills employers demand and develop the professional habits of their supervisors and other role models (Colby & Sullivan, 2008). Put broadly, as a learner, Charlie was socialized into the professional community (Duff, 2008b). His communicative competence (Hymes, 1972) strengthened as a function of social interaction with more experienced, more proficient, or "expert", members of that professional community. Thus, he developed competence in communicating within the community context unique to his workplace. He learned the socially appropriate communication practices of that community and began his journey from the 'periphery' of knowledge as a novice towards what will ultimately cause him to become central member of that community (Brown et al., 1989; Lave & Wenger, 1991). As many researchers (Johri et al., 2014; Newstetter & Svinicki, 2014; Paretti et al., 2014) argue, to an extent all engineering learning is situated learning. By privileging practice, engineering as a field sees professional growth as learning in communities of practice (Lave & Wenger, 1991). In engineering, cultivating communities of practice is viewed as an effective way to develop and manage knowledge so that it can be shared among

members of that community and new knowledge can be created (Goldberg & Goldberg, 2004; Lindkvist, 2005; Wenger et al., 2002)

5.3.2 Industry standards as language tasks.

Paraphrasing a sentence from an interview with a co-op coordinator, work term recruiters know what they need and know what they want in a co-op student candidate. I interpret this to mean that, during recruitment, students are expected to demonstrate to have sufficient language ability to enter the community of practice that exists within the hiring company in the role for which they compete. In other words, the recruiter must be convinced that the candidate is worthy of being a novice among company's experts. To that end, the selection process will emphasise the assessment of the language skills that will be needed in that community over others. To explain this, I refer back to David's job. The recruiter who hired him was likely less interested in David's ability to speak in front of a crowd and more interested in establishing his ability to correctly understand instructions. Conversely, Charlie's recruiter likely assessed the full range of his ability, including whether he could appropriately speak and understand, but also read and write. When the recruiter hired Charlie, it was because she was convinced that his language ability would match the language tasks expected of him.

Both the CLB (2015) and the CEFR (2001) are constructed on a task-based approach. A learner is at a benchmark, when that learner meets the expectations for that benchmark, based on the definitions and descriptions in either the CLB or CEFR scale. When faced with the same situation, learners at higher levels on the CLB/CEFR scale accomplish more complex, sophisticated tasks than learners at lower levels. For example, the former will be able to understand a text completely, perhaps even make inferences on

its author's attitude or tacit purpose. Conversely, a less able learner confronted with the identical text will only manage to capture a few concrete facts and basic information (CCLB, 2013b). For example, during the interview, I asked each student to recall a recruitment interview. While Charlie's answer was exhaustive, David struggled to provide a few information. Based on their understanding of the question I may conclude that both are at an adequate benchmark for listening. However, based on their answers (i.e. speaking), I would evaluate Charlie as a CLB level 10 or CEFR C1 (i.e. CLB advanced/ CEFR proficient user) and David as a CLB 5 or CEFR B1 (i.e. CLB early intermediate/ CEFR threshold independent user).

Since they became operational approximately 20 years ago, the 12-point CLB scale and the CEFR A1-C2 scale have been adopted worldwide for curriculum design, instruction, material development and assessment of English language proficiency of international learners. Consequently, CLB and CEFR prompted the development of hundreds of descriptors for the use with specific learner groups. A particularly relevant example is a project recently completed in Canada. The CELBAN project entailed the development of descriptors for the assessment of the language ability of internationally educated nurses seeking to enter the profession in Canada (CCLB, 2003, 2004; CELBAN Research Team, 2002). CELBAN used the CLB to design a highly-relevant admission test designed on the real demands of the nursing profession, which has since become nationally accredited. Performance descriptors for benchmarking language ability in engineering do not exist. Informed by the CELBAN example, detailed below are some of the language tasks that emerged from the data. Because it is data-driven, the small number of data sources determines how balanced and exhaustive the list below is.

Nevertheless, I present them as a starting point on which performance descriptors for the co-op engineering profession can be further developed.

5.3.3 Work term-relevant language tasks.

I group the language tasks to reflect language ability in each of the four language skills (Speaking, Listening, Writing, Reading) and in four specific areas of competence in which work term communication takes place: interaction, information, instructions, suasion (getting things done). I do not, however, subdivide the tasks to reflect the two stages of work term: recruitment and on the job. That is because, in my view, the work term should be regarded as one endeavour and success should be sought accordingly. For a student to succeed in securing a placement, yet underperform while in that placement, is something that FEAS underemphasises but I view as equally important. Lastly, in the list below I recorded the language tasks most relevant to a junior student preparing for the first work term. This decision was prompted by this research findings. While first-year students are often the least prepared, their language ability is the main factor in the recruiter's decision making process.

Table 1

Work term Language Tasks

Speaking Skill	Description of language task
Professional Language Tasks	Information and instruction: Give/ ask for information, instructions, and directions about routine work requirements, daily activities, personal needs. Ask questions and/or

	clarifications about multi-steps procedures especially as they relate to workplace safety. Presentations: Give a presentation using examples, analogies, diagrams to describe and/or explain a project in general terms, a program, a product, or service. Summarise the main points of somebody else's presentation. Suasion: Articulate problems, issues, and solutions in a familiar context. Negotiate options, concessions, solutions using logical arguments and evidence. Exchange opinions, reservations, (dis)approval, possibility, and probability to coordinate teamwork assignments, delegate a problem, or reach a decision.
Conversation management including social interaction	Express/ respond to: friendliness and appreciation, support, agreement both formally and informally. Constructive criticism, minor conflicts, and disagreements. Contribute to/ co-manage/ lead a meeting or a discussion one-on-one, in a small group, in a

	larger group, both familiar (co-workers) and unfamiliar (conference/ workshops). Change of topic and small talk.

Writing Skill	Description of language task
Professional language tasks	Write 2/3 paragraphs to describe a process, a sequence of events, a detailed comparison. Explain causal or logical relationships between facts, phenomena, and events. Summarize, relate information identified in a table, graph, flow-chart, diagram. Fill out forms and other formatted material. Write routine business messages in professional (formal, semi-formal) emails related to the exchange of information, instructions, events that occurred, advice.
Conversation management including social interaction	Write texts (especially email) expressing gratitude, appreciation, disappointment, (dis)satisfaction (formal and informal). Assess situations, and respond to requests for explanations or clarifications. Schedule/

	cancel/ reschedule professional appointments or meetings.

Listening Skill	Description of language task
Professional language tasks	Understand questions including hypothetical questions (recruitment interview) Understand simple instructions on technical and non-technical procedures (e.g safety). Understand information provided in an oral presentation, discussion, conversation (one-on-one, in small group, in larger groups).
Conversation management including social interaction	Understand warnings, suggestions, recommendations and/or advice.

Reading Skill	Description of language task
Professional language tasks	Extrapolate (multi-steps) instructions presented in moderately complex texts. Identify main points in a professional text, a checklist, form, chart, graphic and/or diagram. Extrapolate information and/or instruction from internal memos, emails, notes (post-its).

Conversation management including social interaction	Identify and collocate the intention of the sender and the formality/ urgency of the message, especially when expressed as opinions or as assessment of situations. Identify and understand points of view and intentions, when explicitly stated Understand formal/ informal texts expressing gratitude, appreciation, complaint, disappointment, (dis)satisfaction.

From the interviews, the CELBAN team identified a total of 37 language tasks (CELBAN Research Team, 2002 p.35) on which correspondent CLB descriptors were applied (p.42). It was determined that English language demands of the nursing profession in Canada were at CLB 7 in Writing, at CLB 8 for both Speaking and Reading, and at CLB 9 in Listening. This means that the nursing profession in Canada expects nurses to be able to understand what they hear above any other skill. I worked at Memorial University as a foreign language instructor for over a decade using CEFR scale (A1-A2). I also worked as a translator and negotiator of international industrial projects for nearly 20 years. As a non-native English speaker, I dedicated most of my adult life working towards achieving the necessary command of the English language that the profession I intended to perform demanded. Based on my academic knowledge and professional experience, I estimate FEAS students' expected levels of achievement to approximate those of CELBAN nurses (level B2 or above in CEFR).

5.3.4 Closing remarks.

I agree with the CELBAN team in arguing that Listening and Speaking skills should outrank Writing. This puts my position somewhat in contrast to what researchers and educators in engineering communication have traditionally argued (Paretti, 2005; Paretti et al., 2014; Paretti & Powell, 2009). Traditionally, writing is the main form of communication in the engineering profession (Schneider, Leydens, Olds, & Miller, 2009; Venters, McNair, & Paretti, 2012). Consequently, Writing has traditionally been prioritized in the education of future engineers. However, as Paretti, McNair, Leydens (2014) argue, engineering communication is evolving and "several important new directions merit mention" (p. 622). Perhaps the most promising among these new directions advocate for a broader reimagination of the "concept of communication" (p.622) in the engineering field and, thus, in engineering education. Schneider et al. (2009) captured this reconceptualization in the acronym WOVE, which stands for "writing, oral, visual, and electronic communication" (p.622). Per Paretti et al. (2014) WOVE promises to take engineering communication outside of its traditional writing-centred vacuum. By acknowledging the realities and complexities of twenty-first century dynamic and multimodal professional contexts, WOVE can change how engineering communication is taught and how future engineers are educated.

Furthermore, additions to the acronym were subsequently suggested. Building on Burnett's argument (2008), a letter N for non-verbal communication was recommended, as was a letter L for listening. The latter was found to be highly valued by prominent engineering education stakeholders, yet virtually absent from the engineering education curriculum. Initial attempts to apply WOVE in the context of engineering education have

begun to appear. For example, on the web portal of the American Society for Engineering Education (ASEE) an undated document on WOVE-based assessment by Burnett is retrievable (A. Burnett, undated). Also, as per March 2017, the Engineering Communications Program at Cornell University has developed content for a 2000-level course in engineering communication aligned with WOVE (CHEC, 2017). Data from this research suggest that there is a distinct overemphasis on Writing rather than Speaking or Listening in the way FEAS students are educated. Thus, international students are often unprepared for recruitment interviews, among other work term related activities that require command of all four Skills. As I recognise myself in the tenets of the emerging research above, what follows is a discussion of FEAS education of future engineers, on the cusp between tradition and modernization.

5.4 Pitfalls of common FEAS competence-building practices

In this section I continue to investigate the possible causes of international students' low performance in the co-op component of the program. The previous section addressed students' more prevalent weaknesses in professional language as relevant to employers. In this section, I take a step back and look at the extent to which some FEAS pedagogical practices may have an unintended effect on international students' development of that professional language. To be more precise, I will address instances where linguistic and especially cultural problems surface, as well as instances where non-learning goes undetected. Literally, the term *non-learning* refers to any situation in which somebody has a possibility to learn something but fails to do so (Illeris, 2012). In practice, however, the term is often used in a considerably broader sense to refer also to situations in which some learning takes place but this learning is incorrect, insufficient, distorted, not in

accordance with what is expected or intended (Illeris, 2012). I will use the term in addressing the quality and relevance of formal and informal support that FEAS provides its international cohort, as well as the support available at university level.

My fourth research question asks what specific changes must be implemented to ensure that sufficient support is provided to international students. To answer this, in closing each interview, I asked participants to share their advice to a hypothetical international student just entering FEAS program, and to FEAS itself. I used some of the feedback I elicited from these questions in the first section of this chapter when I argue for more clarity and direction from the faculty. The objective of this section, however, is to provide a more comprehensive picture of the dynamics relevant to the early development of competence of FEAS international students. Hence, I cross-reference each participant's answer to those two questions and use any additional relevant data interspersed throughout the transcripts. I also rely on FEAS grey literature to support some of my interpretations. My aim is to highlight patterns of consistency and inconsistency across the five participants' groups primarily concerning expectations of accountability for students' learning. Below, I present the main relevant elements of student's learning so that gaps and inefficiencies in the current support system can be identified and improvement can ensue.

5.4.1 Building work term communicative competence.

Learning in Canadian Faculties of Engineering underwent a substantial change in 2010, when the Canadian Engineering Accreditation Board (CEAB) began reviewing programs based on progress toward the assessment of Graduate Attributes (Spracklin-Reid & Fisher, 2013). In addition to the shift from input- to outcomes-based, continual

program improvement became another accreditation criteria. Engineering programs now must demonstrate to have a process in place for the assessment of program outcomes in the context of Graduate Attributes and that assessment results are applied to further program improvement (CEAB, 2014; Iaacson, 2016). Graduate Attributes define the qualifications for employment of engineering graduates upon their completion of an accredited program (Petkau, 2015a, 2015b). The seventh of 12 Graduate Attributes is 'Communication Skills' (i.e. GA:07). Effective communication of future engineers is regarded as a required outcome of postsecondary education (CEAB, 2014) because it is a core requirement of the profession (McMasters, 2004, 2006; NAE, 2004, 2005, 2013). Driven by the need to secure or maintain accreditation status, faculties across Canada devise and implement an array of different approaches to meeting CEAB requirements (Frank et al., 2015; Spracklin-Reid & Fisher, 2014; Subcommittee on Attributes and Competencies, 2013). FEAS adopted a bottom-up approach and is currently developing course-based learning outcomes as the foundation for the assessment Graduate Attributes at program-level (Spracklin-Reid & Fisher, 2013).

CEAB Graduate Attributes are not prescriptive in detail. They reflect the essential elements that are required for a new engineering graduate to enter the profession (International Engineering Alliance, 2013b). Therefore, in this section, their relevance is not to be found in how CEAB Graduate Attributes are defined (including GA:07), but in how FEAS has modified its pedagogical practices because of them. According to Spracklin-Reid and Fisher (2013) at FEAS a set of comprehensive learning outcomes is used to map the curriculum so that areas for improvement in the program can be isolated. According to the authors, this approach allows the faculty to be "intentional" in the

development of Graduate Attributes. Focus on outcomes clarifies expected accomplishments by the end of the course, for course instructors, as well as for students (Frank et al., 2015; Kaupp et al., 2014; Lennon et al., 2014). Thus, course-based learning outcomes form a comprehensive picture of what students are learning in each core course. To satisfy CEAB requirements, course-based learning outcomes also pinpoint where that learning occurs in the program.

In line with the tenet of outcome-based education to establish how students are to learn, that is the learning process leading to the achievement of set outcomes, is secondary. Spracklin-Reid and Fisher (2013) views this as ensuring that "academic freedom is maintained" at FEAS (p.2). Because FEAS considers students to be responsible for their own learning and for achieving outcomes, students have leeway to choose how to learn (see e.g. Co-operative Education Office, 2016). However, research suggests that, especially when learning objectives are yet to be clearly defined (Frank et al., 2015), assessment of learning outcomes is problematic (Dillon et al., 2007; Tshai, Ho, Yap, & Ng, 2014). Consequently, problems in acquiring Graduate Attributes and deficiencies in students' acquisition cannot *always* be identified and addressed in a timely manner (Saunders & Mydlarski, 2015; Spracklin-Reid & Fisher, 2014). FEAS has not yet identified learning outcomes, offers no dedicated course, and does not systematically assess work term communication. In my view, work terms are where FEAS students' readiness is assessed. Assuming FEAS expects or intends for work term relevant learning to occur naturally, research findings suggest that those expectations or intentions are not always met. Findings show that instances of non-learning (Illeris, 2012) occur.

5.4.2 Non-learning at FEAS.

As Benson (1997) argues, instances of non-learning can be attributed to several reasons. First, he argues, there may be "a clash" (p.30) with the teaching approach. Second, the student may perceive what is being taught as irrelevant. Earlier I addressed this as a problem exacerbated by students' poor understanding of work term placement as a unique context in which communication is key in ensuring success. Third, the student may have "poor language aptitude". This important matter is introduced below, particularly in relation to standardized admission tests (TOEFL, IELTS etc.). Lastly, the author contends, students may be "subject to wide-spread ignorance and neglect of their own cultural assumptions" (p.30). This is a critical point, particularly if collocated in the context of FEAS, and most engineering faculties, that view students' learning in the sociocultural or situated perspective "as a process of becoming a fuller participant in a community of practice" (Newstetter & Svinicki, 2014, p. 38) of professional engineers (Litzinger, Lattuca, Hadgraft, & Newstetter, 2011).

Engineering researchers and institutions have fully embraced the belief that engineering students develop relevant knowledge and professional skills naturally through participation in communities of practice (Newstetter & Svinicki, 2014). As Sheri Sheppard et al. (2008) argue, putting practice before theory in situated learning (Lave & Wenger, 1991) allows for the kind of deep learning experience that mirrors professional practice, in which both technical and non-technical skills can develop (Colby & Sullivan, 2008; Gokuladas, 2010; Komerath & Maughmer, 2005; The Conference Board of Canada, 2012). As a result, this approach is viewed as fostering the culture of nurturing a future engineer who is not "just an expert technician" (Sheppard et. al., 2008, p.xxi) but a

well-rounded professional (Besterfield- Sacre et al., 2014; Borrego & Bernhard, 2011). Accordingly, engineering education is progressively becoming synonymous with the well-rounded education of a globally- minded professional− who can work well with people of different cultural, racial, and linguistic backgrounds (Downey & Lucena, 2004; Downey et al., 2006; Symes et al., 2013). In short, changing professional landscapes call for an engineer who can efficiently assess, implement, and communicate decisions in increasingly diverse contexts (Allan & Chisholm, 2008; Downey et al., 2006; Elliott & Fujioka-Ito, 2012; International Engineering Alliance, 2013b, 2013c, 2014a, 2014b; NAE, 2005, 2013; Nungesser, 2002).

To that end, engineering faculties are striving to translate the guiding principles of the situational learning construct into creating learning environments and opportunities for their students to develop the social and material practices of the engineering profession (Johri et al., 2014; Litzinger et al., 2011; Newstetter & Svinicki, 2014). However, as Newstetter and Svinicki (2014) argue, engineering educators are "accomplished disciplinary experts rather than instructional designers" (p.29). Furthermore, research in engineering learning still lacks any systematic understanding and a solid framework of reference that "focuses on situativity and learning in engineering settings" (Johri et al., 2014, p. 47). Clearly, the co-op component of a program may compensate for the shortcomings of in-class situated learning. While engaged in the everyday tasks in a work term placement, students also participate in authentic and meaningful interactions with co-workers. There are many accounts in the findings from students and supervisors about more or less successful workplace interactions, either strictly job-related or more social and informal in nature. From

Charlie's lunch with the contractors to Eric's struggle with small talk, to safety orientations vexing one supervisor, several examples of interaction emerge in the work term practices of co-op students.

However, considering the scope of this dissertation, focussing on how international students interact in school and how conducive to learning the educational environments in which the students find themselves are becomes crucially relevant. International students build the relevant communicative competence (Hymes, 1972) that will support them in transitioning to the work term while in school. In a program where no dedicated instruction is provided, they do so through linguistic socialisation in classroom and course-related activities (Duff, 2008b, 2010; Mondada, 2016; Morita, 2000; Morita & Kobayashi, 2008; Silseth & Arnseth, 2016). Following the above-mentioned shift to outcome-based education in 2010 and the call of engineering education researchers for more emphasis on teaching practice (Borrego & Bernhard, 2011; Colby & Sullivan, 2008; Sheppard et al., 2008), team-based interactive activities have become components of core courses from the first year. The aim of these activities is to bring students together for the united purpose of completing a project and reap the rewards of good grades. Likely, the faculties' working assumption is that under these circumstances students feel motivated, if not compelled, to collaborate and interact.

5.4.3 Ineffectiveness of situated learning at FEAS.

Findings from this research corroborate the stance taken by a small group of researchers who argue that the process of collaboration and interaction may not always be as automatic as one would like or intend. Below, I draw from the argument of several critics who oppose taking a prescriptive approach to situated learning and using it to

design structures of participation for classrooms and learning environments (Greeno, 1997, 2006; Greeno & van de Sande, 2007; Johri et al., 2014). Situated learning, as conceptualized by Jean Lave and Etienne Wenger (1991), rests on the premise that novices are progressively apprenticed into the practices of the community through the guidance and mentorship of more experienced members. Likewise, in the language socialisation perspective (Schieffelin & Ochs, 1986) novices progressively learn culturally appropriate communicative practices of a given community by interacting with more experienced members of that community. In doing so, Schieffelin and Ochs (1986) argue, novices develop competence in communicating within the context of a particular community and progressively move from guided or collaborative to independent action (p. 166).

Community is therefore intended as a social unit that in different theoretical approaches to communicative competence has been defined as "speech community" (Gumperz, 1968; Hymes, 1972; Labov, 1972), "discourse community" (Nystrand, 1982; Swales, 1990), or as "Community of Practice" (Lave & Wenger, 1991; Wenger 1998). Developed out of a formally or informally constituted enterprise, once launched, CoP has its own life and develops its own trajectory as the participants make meaning of their joint enterprise and of themselves in relation to it. How and why members become part of a CoP or otherwise choose to reject such membership and decide to form alternative CoP has engaged scholars interested in, inter alia, in-depth gender and language research grounded in the ethnography of communication (Hymes, 1972). This is well beyond the scope of this research.

Regarding the formation of students' teams for classroom projects at FEAS this research yielded little information. It appears, however, that most instructors leave students free to aggregate in a team with members of their choosing and expect them to include those students who were unable to form their own team. Early in the program, lack of established social relationships on campus especially with local population, may leave international students in the position to join an already formed team. Within the framework of communicative competence, the aim of socialisation is to produce socially competent language users who can master culturally appropriate communicative practices. In this vein, Deardorff (2006) contends that competence is intended as the ability to "communicate effectively and appropriately in intercultural situations based on one's intercultural knowledge, skills and attitudes" (p.247-248) and comprises both effective and appropriate behaviour and communication (Spitzberg, 1989). Considering this, it is important to emphasise that interaction in the context of language socialisation is intended as bilateral interaction, whereby "all parties are agents in the formation of competence" (Schieffelin & Ochs, 1986, p. 6). Yet for some, this may be a particularly arduous task.

Among the students who participated in this study, Anna reported being ostracized by her Canadian teammates during a course project. As a result, Anna failed the course. Most co-op coordinators interviewed indicated that many Canadian students are noticeably "indifferent" towards their international peers. Considering Anna's fluency in English and her friendly personality, I am inclined to interpret her failed interaction experienced rooted in culture rather than language. When interacting, participants use talk to achieve their communicative goals in real life situations (Gumperz, 2003).

‘Contextualization cues’ is the term coined by Gumperz (1982) to describe how the signals sent by the speaker and interpreted by the listener clarify understanding of what is being said. Such cues, as Gumperz (1982, 2003) demonstrated, are grounded in culture and may be syntactic, paralinguistic, and non-verbal. How contextualization cues are used and interpreted by international students during an interaction can lead to the communication breakdown and foster the negative stereotyping that emerged from the findings. Martín Rojo (2010) observed that intercultural misunderstandings are interpreted as failure of communicative competence, which are then “brandished as ‘evidence’ to reinforce negative stereotypes or to justify social exclusion” (p.348).

As Fantini (2008) points out “acceptance by others is more often strained by offending behaviours than incorrect grammar” (p.21). Bennet observes that it is by understanding the cultural dimension of language that learners avoids “becom[ing] fluent fools, able to insult people at ever-higher levels of sophistication” (2008, p. 17). Accordingly, it is now generally accepted, even if still not widely practiced, that "all language education should always also be intercultural education" (Sercu, 2004, p. 72). Yet, most FEAS international students enter the program without any reasonable expectation of being interculturally competent, or even culturally aware. Evidence shows that culturally diverse environments can contribute to an individual's communicative and intercultural proficiency (Engle & Engle, 2004; Freed, 1998; Llanes & Muñoz, 2009; Rees & Klapper, 2007; Williams, 2005). However, they do not automatically lead to intercultural contacts and learning experiences (Otten, 2003; Spencer-Oatey & Dauber, 2015). Paradoxically, the mutual collaboration among students endorsed by institutions can trigger conflict in a culturally diverse classroom. As a result, domestic students may

exclude their international peers, or international students may choose to self-segregate (Otten, 2003; Sheridan, 2011; Swaminathan & Alfred, 2001). In either case, this causes the interruption of the process that relied on students' interaction to build relevant communicative competence. In view of upcoming work term competitions, this determines the de facto failure of the learning activity.

5.4.4 Additional considerations.

Considering the discussion above, additional considerations regarding key areas in need of attention are worth addressing. First, findings suggest the need for the faculty to sharpen its international recruitment strategy to better fit with program requirements. Second, to begin closing international students' co-op employment gap, the development of international students' communicative competence relevant to work term placement must begin in the first semester of the program and align with industry demands. Third, although efforts and initiatives aimed at fostering a culture of diversity are already being developed and implemented at FEAS and Memorial, findings indicate that more targeted interventions may be required if peer-to-peer intercultural interaction is part of a pedagogical strategy intended to improve students' communication skills, among other Graduate Attributes. In this section I briefly elaborate on these points to set the ground for the discussion of this research implications in Chapter 6 that concludes this dissertation.

As Philpott et al. (2014) observed, "Memorial is not attracting the most academically competent or the wealthier students" (p.14). This statement refers to the push and pull factors affecting the success of the university international recruitment efforts. Traditionally, highly competitive tuition fees have been one of Memorial's strengths in attracting national as well as international students. I posit that international

students applying to FEAS are both attracted and possibly distracted, by the prospect of earning a Canadian engineering degree while paying low tuition fees and meeting merely average English proficiency requirements (e.g. TOEFL, IELTS). Case in point, participants identified several first-year FEAS students who are woefully unprepared to meet the language demands of the program. This suggests that, perhaps, the international recruitment and admission process does not explicitly state the language and communication requirements of the co-op program in the information package targeting international applicants. As a result, applicants may not be aware of exactly what they will be expected to accomplish, in English, once admitted to the program.

The importance of authenticity in communicative competence cannot be underestimated (Bachman & Palmer, 2010; Canale, 1983a; Canale & Swain, 1980; Celce-Murcia, Dörnyei, & Thurrell, 1995; Hymes, 1972). Language tasks essential to student's success must be presented in their realistic complexity, highlighting the fact that being unfamiliar with each task or with the context of use would make achieving success more challenging (CCLB, 2015b). In formal and informal ways, authentic communicative tasks reflecting students' day-to-day life and work at FEAS must then be emphasized throughout the course of study (CCLB, 2005, 2015b; Council of Ministers of Education Canada, 2010).

The faculty can access a vast array of resources including students, co-op coordinators, recruiters, supervisors, and alumni to create a taxonomy of important language tasks applicants should master as they arrive at FEAS. Furthermore, several useful documents are available to help users navigate both CLB and CEFR as frameworks of reference for language ability (CCLB, 2005, 2013a, 2016; Council of Europe, 2001;

Council of Ministers of Education Canada, 2010; North, 2014). In nearly all these documents the Can Do descriptors of language ability have been simplified to make language abilities and levels of competence easily identifiable by both educators and learners. However, change in this direction impinges on FEAS willingness to take an active role in ensuring that international students entering the program have a reasonable expectation of success. That entails the faculty acknowledging the role of communicative competence as a key factor in that success, as demonstrated by this research.

Research findings prove that the problem of adequacy and fluency in language ability requires addressing the concept that "initial and developing stages in which the degree of familiarity with both tasks and context need to be considered" (CCLB, 2015b, p. 12). This collocates language ability as progressing from enrolment to the first work term competition in Academic Term 3 (i.e. third semester). But it also extends beyond that point, as the student confronts increasingly complex language tasks in progressively more demanding contexts (CCLB, 2015a) with each subsequent work term. And, while within the CLB and CEFR models it can be assumed that the student will progress while in the program, it is worth remembering that that progress will happen mainly in informal settings rather than within a formal ESL instructional sequence. For that reason, aiming at recruiting students whose language ability is above the basic threshold, (see Canale & Swain, 1980; van Ek, 1977; van Ek & Trim, 1991) is critical. Furthermore, researchers dispute the reliability and effectiveness of English language standardised tests currently used to screen international applicants (Bridgeman, Powers, Stone, & Mollaun, 2012; Fox, 2009; Kokhan, 2012, 2013; Malone, 2010; Vinz, 2013). Consequently, there may be

the need to formally and informally assess applicants' ability to communicate effectively during their first year at FEAS.

It is important to reiterate that language ability here is intended as the specific competence needed to effectively and appropriately communicate in professional settings related to work term placement. Accordingly, competence-building initiative and formal or informal assessments must aim at aligning communicative competence with industry demands. The first year in the program is undoubtedly the toughest for international students (Berman & Cheng, 2010; Hotta & Ting-Toomey, 2013; Zhou et al., 2008). Yet, as findings indicate, the first year at FEAS is also the most crucial in setting the grounds for co-op professional success. It is during the three semesters that comprise Engineering One that international students learn what they need to succeed in their first work term competition. As recruiters point out, effective and appropriate behaviour and ability to communicate often determine the hiring of first-year co-op students. At this juncture, technical knowledge is minimal. However, during the interviews FEAS co-op coordinators, who are competent engineers, admitted feeling ill-equipped to provide the language and intercultural support some students need. Conversely, Staff at CDEL are experienced in helping international students improve language and cultural weaknesses. They seldom have discipline-specific knowledge. Lastly, Engineering One comprises courses covering engineering fundamentals with still limited exposure to engineering practice outside of course or classroom settings. As a result, some international students may find preparing for the first work term particularly arduous.

To that end, the communicative competence framework can provide the basis for designing a 'language program' that meets the needs of FEAS specific learner group. In

addition to being task- and action- oriented, language pedagogy in the communicative approach is also student- centred. Namely, central to this approach are not only the real needs of the students as language users (Canale, 1983b; Canale & Swain, 1980; Widdowson, 1989) but also their desire, or motivation, to take an active role in learning to achieve autonomy (Bachman & Palmer, 1996; Nunan, 1988). The notion of self-assessment (Trim, 1978) transforms the role of the student into a free subject conscious of the learning process. Since the early works by Oskarsson for the Council of Europe (1978, 1980, 1984), the learner's ability to self-assess is seen as a means to develop what Little and Simpson (2003) and Bachman and Palmer (1990, 1989, 1996) describe as capacity of the student to learn. Consequently, the role of the educator becomes that of a facilitator in the learning process.

Comparing my findings with the FEAS grey literature directed to students (i.e. the Handbook, Co-operative Education Office, 2016), I argue that the notion of "maturing prospective engineer" presupposes the student taking an active and conscious role in the learning process. That includes the development of work term relevant professional communication skills. Accordingly, the task of co-op coordinators is congruent with the idea of facilitator in the process rather than of a teacher in the traditional sense. However, it is how the notion of "maturing prospective engineer" is operationalized by FEAS that is problematic. Not all international students are like Charlie, active and autonomous, conscious of his weaknesses and in charge of the process to correct them. Charlie dreams of becoming an engineer and fully recognises the meaningfulness of becoming an effective communicator to achieve his goal (e.g. see Brown, 1994, 2007a, 2007b; Skehan, 1998, 2007). One of the underlying fundamental principles of language pedagogy in the

communicative approach is meaningfulness (CCLB, 2015b, p. 44). Richards and Rodgers (2001, 2014) contend that the use of language that is meaningful to the learner, promotes language learning. It is from this standpoint that I view FEAS's challenge to educate prospective engineers as good communicators.

Considering this, there was no definite indication in the findings as to whether it was clear to the international students that the faculty considered them as "maturing prospective engineers" (Co-operative Education Office, 2016, pp. 1, 11) in charge of their own learning. Furthermore, an analysis of the interviews' transcripts revealed that some international students view language ability and effective communication more as a means to an end of securing a work term than a requirement of the profession (see e.g. International Engineering Alliance, 2013a; Katehi, 2005; McMasters, 2006; NAE, 2004, 2005; Rajala, 2012; Whitman, Toro-Ramos, & Skinner, 2007). This may account for the disregard in seeking help, if not after several failures to secure a placement, and in the lack of interest in constantly improving one's communication, that participants observed in some international students. In the next chapter I address this issue as I discuss the implications for practice that the findings generated.

In closing this section, I further emphasise the critical importance of not simply fostering but building a culture of diversity on campus and in the classroom. With internationalization being the norm in Canadian higher education, responding to linguistic and cultural diversity on campus is challenging for students and the university as a whole. A growing body of research discusses exclusion or self-segregation among international students (Alazzi & Chiodo, 2006; Barratt & Huba, 1994; DeCapua & Arbor, 2004; Gebhard, 2012; Green & Dixon, 2008; Lee et al., 2005). In this climate institutions must

solve problems generated by diversity if they expect to profit from it (Fortuijn, 2002; Otten, 2003; Spencer-Oatey & Dauber, 2015). Ultimately, the goal is to improve the international students' overall experience and maximise their access to opportunities during their studies (Ife, 2000; Llanes & Muñoz, 2009). To that end, intercultural competence has been studied in postsecondary education (Deardorff & Jones, 2012; Deardorff & Van Gaalen, 2012). However, Intercultural Competence is a complex construct and, as Deardorff (2006) argues, "knowledge of language does not guarantee intercultural competence" (p.260). Furthermore, as the findings indicate, intercultural competence is not a prerogative of international students.

Because it is associated with the individual's response to encountering cultural differences, and understood as the individual's ability to manage cultural differences (Yershova et al., 2000), in educational contexts, such as the one central to this dissertation, Intercultural Competence concerns international as well as domestic students. Results obtained by Philpott et al. (2014) from having administered the Intercultural Development Inventory (IDI) to a randomized sample of 135 Memorial faculty, staff, and administrators showed that participants are well intentioned, but struggle when challenged on issues that are culturally based. IDI is a standardized instrument that measures one's acquisition and use of intercultural competency skills based on Bennet's Developmental Model of Intercultural Sensitivity (DMIS) (1993). Nearly nothing is known about FEAS domestic and international students' dynamics relevant to the early development of intercultural competence, particularly those that may characterise course-related interaction, which this research identified.

5.4.5 Closing remarks.

In this section I discussed ways by which FEAS international students are expected to acquire the communicative competence needed to successfully complete the co-op program component. I focused primarily on the potential pitfalls of the situated learning perspective as implemented by engineering faculties in their attempts to approximate professional practice. I agree with researchers who oppose the unquestioned adoption of this method by engineering faculties. Operating under the assumption that communities of practice are homogenous, harmonious, and stable communities (Greeno, 1997; Johri et al., 2014) is unrealistic. Furthermore, the potential for tension and conflict arising from interaction in heterogeneous student cohorts to go unreported and remain unaddressed is high. Although only Anna reported having experienced problems during team-based course projects, I believe that instances of exclusion or self-segregation involving international students are far more common than faculties or students wish to admit. Researchers have studied the implications of poor social interactions on international students' emotional wellbeing as well as academic performance. In the next chapter, I build on this discussion as I formulate this study implications for practice, for policy, and for future research, as relevant to the development of communicative competence for co-op employment of FEAS international students, central to this dissertation.

Chapter 6

Conclusions and Implications

6.1 Conclusions

This research was prompted by anecdotal information circulating within the university community about international engineering students struggling and failing in their attempts to secure work terms because of poor soft skills, especially communication. To investigate this claim, I designed a single embedded exploratory case study and I conducted 18 semi-structured interviews with international undergraduate students enrolled in the co-op undergraduate Bachelor of Engineering program at Memorial University, FEAS co-op coordinators and university students' support staff, and representatives from the engineering industry. In choosing this research design I intended to investigate FEAS international students' shortfall in co-op recruitment from different perspectives, by eliciting the input of key informants, as well as of the students themselves. I also intended to focus on the efforts made by the faculty to prepare international students to meet the work place challenge. From the comparative analysis of the findings key points in need of attention emerged. I discuss each point by drawing on the conceptual framework of communicative competence (Hymes, 1972) as operationalised in the Canadian Language Benchmarks (CLB) and the Common European Framework of Reference for Languages (CEFR).

Analysing the findings through those lenses provided me with the necessary structure to view work term communication as a prospective outcome of curricular education at FEAS in need of attention and of intervention. In my research I look at language ability and intercultural competence as one of the professional skills most

relevant to co-op employment in the engineering sector. However, unlike mainstream research that views such skills as an outcome of a successful co-op program, I consider them as a prerequisite for it. Findings from this research indicate that certain behaviours and levels of communication are required for successful hiring and placement, highlighting the importance of students' preparation prior to starting each round of work term competition. In that regard, interviewees reported significant differences in the quality of communication (Spitzberg, 1989) among FEAS international students, with some students' language ability (Bachman, 2010) being remarkably poor. These differences reflect in large disparities in students' recruitment rate and in long-term career prospects.

As discussed, FEAS international students need greater clarity of expectations and dedicated support tailored to their needs as English L2 users entering the unfamiliar context of the Canadian engineering workplace. This is because findings show that the language ability and intercultural competence that co-op recruiters and supervisors expect of a candidate are neither explicitly stated by FEAS nor immediately understood by all international students. This results in some students lacking initiative in seeking guidance and requiring clearer direction. Furthermore, from the findings it emerged that deficiencies in international students' work term preparation are not clearly identified and addressed in a timely manner. As a result, this cohort's progress is generally inconsistent and, in some cases, insufficient to meet the work place challenge. It is considering the short- and long-term implications for the student that in my data analysis I identify patterns of acceptable and unacceptable level of language ability and intercultural competence. Using the CEFR and CLB as reference, I, thus, view recruiters and

supervisors' language expectations as language tasks the student needs to master prior to competing for a placement. I regard intercultural competence as a key overlooked factor in ensuring appropriacy of students' communication in the context of co-op employment.

As interviewees pointed out, students who are good communicators secure a co-op job and have better prospects of growing professionally while on the job, being oftentimes hired by a company interested in investing time and resources in their in-house training. Conversely, students whose communication are not effective and appropriate, in the eyes of the recruiters, are either not hired or are hired for less professionally enriching positions often associated with less positive career outlooks. Given the academic, financial, and social high stakes of work term placements, this research points at the need for the language ability (Bachman, 2010) and intercultural competence (Deardorff, 2011) of international students to be addressed specifically against co-op program requirements early in the program. The stance adopted by FEAS presupposes a high degree of student agency over the learning process and rests on the premise that work term guidance and support need not be differentiated between domestic and international students. This is congruent with the faculty's decision to consider all FEAS students as "maturing prospective engineers" (Co-operative Education Office, 2016, p.11) and regards also students' development of work term-relevant professional communication. Some international students respond positively to this and transition seamlessly and successfully to co-op employment (e.g. Charlie). Others do not.

Aligned with this view, I evaluate the pedagogical strategies and practices adopted at FEAS for the specific purpose of preparing students to communicate effectively and appropriately in an engineering setting. Specifically, this study indicates the need for

FEAS to review the current use of course-based situated learning (Lave & Wenger, 1991) in a context of the increasingly diverse student population. Situated learning rests on the premise that newcomers learn from their domestic peers the culturally appropriate communicative practices of that community. Findings from this study show that at FEAS several factors may inhibit such competence-building interaction and limit the efficacy of this widely adopted practice. Affecting intercultural interaction within classroom settings may be the quality of international students' communication but also domestic students' attitudes towards international peers (Otten, 2003; Spencer-Oatey & Dauber, 2015).

In investigating the role of communication in international students' success in the co-op component of the FEAS program, this research has begun to uncover how international students learn to communicate effectively and appropriately for a work term professional context. Importantly, it identified some of the factors that may inhibit such learning. These include poor understanding of the importance of communication for the engineering profession and language and cultural barriers affecting the outcome of socialisation with domestic students. It identified in insufficient guidance and unsystematic support from the faculty a limit to international students' achievement of desired levels of competence. As current pedagogical practices adopted at FEAS, and in most engineering faculties in Canada, are not always effective, identifying alternative solutions becomes a priority. For this reason, in the next section, I discuss the implications for practice and policy that this study has generated. I draw on the findings that show that FEAS efforts in preparing international students to communicate effectively and appropriately in co-op settings are insufficient in filling the lacunae of some students.

Recent years have seen the growth of co-operative programs in Faculties of Engineering across Canada. Nearly one third of the 281 Bachelor of Engineering Programs offers a co-op component. My research is situated in the co-op only program offered by FEAS where international students represent approximately 10% of the undergraduate student body. With trends suggesting a steady growth in foreign enrolment and an increase in diversity for this faculty student population, ensuring that academic and professional success is attainable for international students is a challenge I consider worth investigating. With graduation requiring completion of both the academic and the professional component, success for this cohort is uniquely contingent upon the faculty responding to student needs for co-op placement. Changes in student population call for a more capillary understanding of the dynamics of internationalisation at FEAS and at Memorial University, to which this research intends to contribute. In closing this chapter I indicate possible directions for future research generated by this study.

6.2 Implications for practice

At a glance, given the widespread nature of the issue among international students, the shortfall in work term recruitment is undoubtedly a problem at FEAS. The subject often surfaces in conversations with members of the university community where priority faculty concerns are discussed in relation to the changes in student demographic caused by the 2020 growth plan. There is considerable speculation about the frequency of this problem. However, lack of discrete data at FEAS on the performance of international students inevitably gives way to hasty assumptions and sweeping generalisations that are too often based in anecdotal information rather than evidence or established facts. Lack of clear evidence, especially discrete data on international students' actual performance in

the co-op component, limits one's ability to shape an informed opinion on the issue or begin to strategise priorities and interventions. Because students' efforts to secure a work term are not systematically recorded by anyone other than the student, it is impossible to track failures that might precede a successful placement. Likewise, because it is not mandatory for students to consult a co-op coordinator prior to or during a job search, possible reasons for a no-hire may not be appropriately investigated and identified.

There are many reasons why co-op students are not successful in securing a work term placement. These include economic downward trends affecting the industry, lack of available co-op positions dictated by the nature of a project or, simply, a bottleneck caused by increases in students' enrolment in the co-op program. Factors internal and external to a hiring company can negatively affect employability, with the results being competition growth for available positions compounded by fluctuations in recruiters' expectations. Nevertheless, to assume that a substantial number of international students suffer co-op unemployment would be incorrect, given that most of them succeed and some excel. But, comparatively speaking, more international students struggle to be hired than their domestic counterparts and, in some cases, they accept positions with educational value that are less professionally stimulating and personally fulfilling. International student success is hindered by not only a lack of mastery of the English language but also culturally-rooted barriers affecting the quality of their verbal and non-verbal communication. Many foreign students have limited or no previous job experience either in Canada or in their country of origin and are unfamiliar with the norms, styles, and practices of Canadian professional communication.

International students transitioning from academic to professional roles do not always fully appreciate the critical changes that are required of them. They fail to grasp the implications of that transition on their communication requirements. This is a critical oversight that accounts for many of the unfulfilled aspirations of any number of well-intentioned students, who ultimately approach their work term unaware that they are ill-prepared and unequipped. The adoption of standardised tests for admission into the program further exacerbates this situation. Findings from this study confirm what researchers have been disputing with regard to the reliability and effectiveness of standardised English language tests currently used to screen international university applicants (Bridgeman, Powers, Stone, & Mollaun, 2012; Fox, 2009; Kokhan, 2012, 2013; Malone, 2010; Vinz, 2013). Those same findings also point to the inherent limitations of such tests for estimating students' language ability in non-academic settings. International students may be operating with a false sense of security regarding their ability to communicate because they assume that their language ability is sufficient for completing both components of the program. At the same time, FEAS may be over-confident in such test results and presume that, once admitted in the program, international students will realise their lacunae and seek help to correct them.

What is clear from this study is that without a system in place designed to ensure the continual improvement in quality and effectiveness of communication after admission, the gap between employability of international and domestic students is likely to widen as the competition for placements tightens. Based on this study, I identified three problematic areas where FEAS may consider sharpening precision and range of responses required when preparing international students to transition to work term. First is the early

identification of international students at risk of failing the co-op component of the program (e.g. Fox et al., 2016). Second, participants' interviews highlighted shortcomings in relation to student support, particularly in the capacity of existing support to reconcile the building of professionally-relevant communicative competence with the barriers to effective communication of this cohort. Third is the distribution of short- and long-term responsibility and accountability for building ad hoc communicative competence in international students. I will elaborate on each of these areas next.

Research findings suggest that the problem of adequacy and fluency in language ability requires addressing the notion of progress. This is understood to encompass "initial and developing stages in which the degree of familiarity with both tasks and context need to be considered" (CCLB, 2015c, p. 12). For me language ability progresses in two main stages along the undergraduate curriculum. One covers the expected progress from enrolment to the first work term competition in Academic Term 3 (i.e. third semester). The other extends well beyond that point and ends at graduation. In both stages, each work term requires that the student meets increasingly complex language tasks in progressively more demanding contexts (CCLB, 2015a). Based on findings, it may be argued that it is in phase one when the most attention to student progress must be exerted so that the foundations for communicative competence and a solid knowledge base of the industry can be built. At that time students have yet to choose the engineering discipline in which they will eventually graduate. They have limited knowledge of the intricacies of working in the engineering sector, including the type of communication a professional role in that industry entails.

Any opportunity that can potentially broaden their knowledge and deepen their understanding is valuable in aligning their communicative competence with industry demands. For that reason, I recommend that every opportunity be taken to reinforce with all Engineering One students the understanding that effective communication is not simply a means to an end of securing a work term, but rather a requirement of the profession (see e.g. International Engineering Alliance, 2013b; Katehi, 2005; McMasters, 2006; NAE, 2005; NAE, 2004, 2005; Rajala, 2012; Whitman et al., 2007). Indeed every "maturing prospective engineer" (Co-operative Education Office, 2016, pp. 1, 11), should be educated early in the program to view the continuous improvement in professional communicative competence as a priority. Becoming an engineer depends also on fully recognising the meaningfulness of becoming an effective communicator to achieve that goal (e.g. see Brown, 1994, 2007a, 2007b; Skehan, 1998, 2007). One of the underlying fundamental principles of language pedagogy in the communicative approach is meaningfulness (CCLB, 2015c, p. 44). Richards and Rodgers (2001, 2014) contend that the use of language that is meaningful to the learner, promotes language learning. If international students undervalue the importance of strengthening their communication, that value must be emphasised.

It is from this standpoint that I view FEAS's challenge to educate prospective international engineers as good communicators. To win that challenge is to convey to first-year students that the work term is not a goal or an end in itself, but rather a starting point and a step in a process conceived to make them better engineers (Newstetter & Svinicki, 2014); and that communication plays a pivotal role in that process as it does for a career success in engineering. In that regard, the contribution that industry

representative can provide is vital. Industry representatives can corroborate and validate not only the importance of effective and adequate communication in general terms, but also provide tangible examples of where that competence is most required. Strong cooperation between faculty and industry should be geared towards raising students' awareness and, indeed, identifying, defining, and ultimately clarifying for them exactly what they will be expected to accomplish, in English, once admitted to the program and when competing for a job. Authentic communicative tasks reflecting their day-to-day life and work while in the program must, therefore, be emphasised early and throughout the course of study (CCLB, 2005, 2015c; Council of Ministers of Education Canada, 2010).

The importance of authenticity in communicative competence cannot be underestimated (Bachman & Palmer, 2010; Canale, 1983b; Canale & Swain, 1980; Celce-Murcia, Dörnyei, & Thurrell, 1995; Hymes, 1972). Language tasks essential to work term success and to co-op-related professional growth must be presented to students in their realistic complexity. The widespread use of overly generic, all-encompassing terms or the delivery of ambiguous instructions contribute greatly to confusion amongst students about how to correctly interpret the rules and collocate expectations. In this study, examples of such practice emerged in the form of referring to 'communication skills' or the need to improve 'one's English' and 'tailoring' the job application to the hiring company, the job or the role for which one applies. First-year students, international or otherwise, do not have sufficient experience or knowledge to identify the root of possible problems and shape an effective course of action (see e.g. Molinsky, 2007, 2010; Molinsky & Perunovic, 2008). To that end, international students would benefit from knowing not only what language tasks a work term entails but also the degree to which their own

language ability and intercultural competence measure up to those expectations, given each student's degree of familiarity with each task and context of use (CCLB, 2015c).

Ultimately, whether as work term applicants or as graduate job candidates, students must satisfy the expectations of their potential employers. Industry representatives interviewed suggest that much improvement is necessary in the developing of students' awareness and knowledge of the link between communication, co-op selection protocols, and on the job success. Notably, interviewees from that group did not articulate that effective communication is necessarily culturally competent (Deardorff, 2006) and comprises effective and appropriate behaviour and communication (Hannawa & Spitzberg, 2015; Spitzberg, 1989, 2000). However, their descriptions of exemplar successes or failures by international student candidates clearly reflected it. Findings showed that in the international cohort of Engineering One there are students whom I would define as outliers. These are exceptional students who are ready to succeed in a work term as they enter the program and others at the opposite end of the spectrum whose poor language ability should have precluded their admission. Those who are neither, seem to be the majority, can be placed at various points along a continuum between the two.

Knowing where precisely to place students in this last group is critical for their progress, especially since that progress will not happen within a formal ESL instructional sequence but rather in non-formal or informal settings (Cedefop, 2014). Viewing language ability as evolving along a hypothetical continuum or scale (CCLB, 2015c) entails considering progress as flowing along a continuous path. As language ability builds throughout the learning process, the student progresses in terms of individual degree of "ability to succeed in the task" (p.15) and not in a structured or predictable way.

Identifying students' weaknesses early in the program so that they can be improved or corrected is perhaps the most urgent suggestion of participants from the university group. However, work term communication, as intended in this research, is not comprehensively assessed at FEAS. This leaves the work term to function as the only true assessment that international students encounter. FEAS and industry's collaboration in identifying work term-specific language tasks essential to each of the four mandatory work terms would provide the basis on which student progress in the ability to complete those tasks could be established and monitored from admission to graduation (CCLB, 2008; Council of Europe, 2017d).

As Fox et al. (2016) argue, the practice of post-entry diagnostic assessment of L2 engineering first-year students has increased in recent years as a means of identifying "students at risk and provide them with early academic support" (p.43). Its adoption, according to the authors, is prompted by concerns about retention and program completion of linguistically and culturally diverse student population, and the misinterpretation of "high scores in language proficiency tests as evidence of academic readiness" (p.44). As a result, they argue, first-year engineering students in Canada are "at risk of failing or near-failing the first year" (p.43). In response to this problem, the team of researchers designed an academic language test fine grained for the engineering domain. Their assessment procedure is situated with engineering text, tasks, and expectations of performance to enhance the overall relevance of the assessment (Bachman & Palmer, 1996) as well as "the specificity (fine grain) of information included in the learning profiles of individual students" (p.58).

For the international students in my study, a work term no-hire was reported as the main cause of delays in program completion. A parallel can be drawn between the students "taking the same course several times" in Fox et al. (2016, p. 44) and FEAS students' many attempts to secure a placement before succeeding. Accordingly, FEAS students would benefit from a post-entry assessment fine-grained to text (intended as both oral and written), tasks, and expectations of performance of the co-op component. Results from such assessment may aid in aligning international recruitment with program requirements as well as informing more accurate and appropriate student support initiatives. Findings from my study indicate that there are substantial differences in the way students pursue improvement and success, particularly regarding the decision to seek help from designated support centres. In conducting this research, it became increasingly clear that some students avoided seeking support provided either by FEAS or by the university and opted to tackle the challenge themselves. From the interviews, it emerged that FEAS international students, particularly first-time job seekers, consider the inadequacy and insufficiency of available support as a significant factor in their delayed hiring.

Students' personal preferences as well as their knowledge of the range of university offers may be a contributing factor in their choice of support channel. Nevertheless, the risk of students being delayed in progressing through the program because of missed opportunities to improve due to lack of support cannot be overlooked. Given this risk, the support system in place must be robust and well-integrated across the various structures and teams on campus. Although in engineering there is a strong tendency to believe in the organic development of competence through situated learning, the provision of support

should remain an essential element of the process. From the results, it appears that students need more guidance than support in the traditional sense, particularly if the student has reached a relatively adequate level of language ability. Support currently offered at FEAS has some limitations, which this study identified. There are two main official sources of support, the team of FEAS co-op coordinators and the university staff at CDEL (Career Development and Experiential Learning). Although their respective areas of competence may be considered complementary, hence producing cumulative benefits, students interviewed in this study are dissatisfied.

As reported, co-op coordinators are competent engineers, knowledgeable in finding solutions that increase students' employability in the industry and experts in all professional aspects of the co-op program. They are, also, by their own admission, ill-equipped to provide the language and intercultural support some students need. Nevertheless, international students expect them to correct their language and intercultural lacunae and attribute to them the responsibility of helping them build professional communicative competence. As a result, students misinterpret the boundaries of a co-ordinator's role and mandate and question the quality of support provided. Staff at CDEL are experienced in helping international students improve language and cultural weaknesses that may hinder students' transition to the workplace. They rarely have discipline-specific knowledge of the engineering sector and of its expectations in terms of co-op job candidates. Because of this, international engineering students undervalue this team's potential contribution to their professional success and do not often seek help from this group. Importantly, even after benefitting from both teams' assistance, international

students may find it difficult to reconcile the support received into one positive action that generates employment.

At the root of the problem lies a lack of awareness on the part of many international students of their own agency over their learning and in identifying sources of support appropriate to their needs. Despite several reminders in the material directed at students by FEAS, international students continue to struggle with the overall concept of self-directed learning, intended as a student taking the leading role in the progress towards employment. It is here that I envision the guidance mentioned above as most effective. To that end, either communicative competence frameworks, that is the CEFR or the CLB, can provide the basis for designing a path to progress for use of this learners' group as language users (Canale, 1983a; Canale & Swain, 1980; Widdowson, 1989) in support of them taking an active role in learning (Bachman & Palmer, 1996; Nunan, 1988), if no specific guidance, rubric, or feedback is provided.

It is worth considering that the past experiences with education and learning of many international students are often highly-structured within the criteria, parameters, and boundaries of their home country curriculum. It is, therefore, to be expected that students accustomed to that type of teaching and learning would find it difficult to switch to a teaching and learning approach that put so much emphasis on their own agency and on the implicitness of situated learning. Supporting international students, then, becomes more an effort to strengthen their capacity for learning than actual instruction. Through target initiatives geared towards raising learning awareness, student support should aim at showing students where they can learn and how they can learn from each situation. In short, reflecting what engineering education researchers have advocated for years, the

goal of engineering education is to enable students to acquire relevant competence before entering professional settings (Borrego & Bernhard, 2011; Sheppard et al., 2008; Sheppard et al., 2011).

Considering that everything about engineering communication is situated (Newstetter & Svinicki, 2014; Johri et al., 2014) and that the teaching, learning, and assessment of communication is embedded in the program, enabling the student to benefit from it is a priority. A study conducted in England surveyed the best practices to teach transferrable skills, including communication, to undergraduate engineering students (Chadha & Nicholls, 2006). In concluding that different methods are more effective at different stages of the curriculum, the authors contend that the embedded strategy proved most effective in first-year courses (Chadha, 2006; Chadha & Nicholls, 2006). The two other methods evaluated entail varying degrees of integration of teaching communication with the core program disciplines. These are, according to the authors, more appropriate for students later in the program. In all three cases, but especially when the embedded method is adopted, unless there is an explicit awareness of the student of the skills development that takes place in the course, the associated teaching is less effective (Drummond, Nixon, & Wiltshire, 1998). Therefore, the key to students' progress, which escapes FEAS students, is their awareness of the process and of the goal of learning communication at different stages throughout the entire program.

Communication as embedded outcome of most courses and of the overall pedagogical practice at FEAS, for the most part, remains implicit and, as a result, its achievement is underemphasised. Students overlook the fact that, while taking a course, in addition to meeting course requirements they are also expected to develop their ability

to communicate effectively and appropriately. This mirrors the problem some students have with communication and work term placement. At FEAS, communication, intended as CEAB GA:07, is an outcome at both course and program level and course-based curriculum mapping linking attributes, outcomes and assessment has been completed (Spracklin-Reid & Fisher, 2013, 2014). Nevertheless, results from my research suggest that by looking at the continuity, consistency, and accountability of the students' communicative competence building process, areas of improvement and gaps emerge. To reach this conclusion, I relied on the multi-point and multi-source approach that guided the design of this research to identify where international students are given an opportunity to become better communicators and what are the factors contributing to them progressing or not along the continuum. Drawing from the interviews, what follows is a summary of my observations on where language ability can be and is developed at FEAS, whether in academic or workplace settings (see e.g. Brunhaver et al., 2017 in Progress; Paretti et al., 2014).

Learning to communicate effectively as engineers entails understanding the contextual, situated, nature of engineering communication (Paretti et al., 2014). For that reason, FEAS and other engineering faculties and schools increasingly adopted the strategy advocated by researchers of mirroring professional practice in their academic activities (Besterfield- Sacre et al., 2014; Borrego & Bernhard, 2011; Sheppard et al., 2008). Some researchers, however, argue that students' true awareness of the more social, interpersonal, and organizational dimension associated with being an effective engineering communicator can only be achieved after a rather extensive industry experience (Brunhaver et al., 2017 in Progress; Leydens, 2008; Paretti et al., 2014). As

Paretti et al. (2014) argue, there is an urgent need to move away from practices that presuppose students attaining awareness over time and, instead, create classrooms and assignments that "accelerate students' development" (p.615) before they enter the profession. Integrating learning environments and activities along the entire program continuum provides students with opportunities to learn about real engineering work at every stage of the undergraduate program (Sheppard et al., 2011). This is true when such environment and activities are indeed successful. Otherwise, they may be viewed primarily as a distraction from content knowledge (Brunhaver et al., 2015; Matusovich, Paretti, Motto, & Cross, 2012).

My study identified several barriers to successful learning of effective and appropriate communication from FEAS course embedded activities and environments. First is the lack of meaningful rubrics for both students and instructors engaged in course-related situated learning activities (Paretti, 2006). Second is the underutilization of the Portfolio to assess student progress across a range of disciplinary genres and contexts within and across initiatives (McNair, Paretti, Knott, & Wolfe, 2006; Ostheimer, 2005; Paretti, 2005). Third is the overreliance on the readiness and willingness of domestic students to assume the role of "master" envisioned by Lave and Wenger (1991) in the legitimate peripheral-to-membership participation of international students. The implications for research regarding each of the three barriers are discussed below.

Rubrics and exemplars help students internalize the qualities of good communication, promote consistency of feedback, clarify instructor's expectations by providing explicit and established criteria (Lam, 2013a, 2013b; Reddy & Andrade, 2010). However, when using rubrics with international students some considerations are worth

noting. Li and Lindsey (2015) advocate for the use of simpler language or even a simplified language in rubrics. Words such as ‘sophisticated’ or ‘articulate’ can be easily recognised as keywords but their meaning may be difficult to grasp by students with little to no experience interpreting their instructors’ directions. McRae (1996) explains that those commonly used ‘evaluative terms’ may generate vastly different representations in different readers who may hold different world-views (see also e.g. H. Li & Suen, 2013 ; Z. Li, 2015). Furthermore, research shows that there are variations between students and instructors’ readings of rubrics and this mismatch influences opinions regarding the effectiveness of the use of rubrics as assessment or instructional tool in a university program (J. Li & Lindsey, 2015). To increase consistency and effectiveness of rubrics when used by students and instructors, some scholars suggest that rubrics be student-created or, at least, co-created to be more meaningful to a diverse student population (Stevens & Levi, 2005).

Along with course rubrics, the adoption of course-based communication portfolios has become the norm at FEAS. This is in line with research in engineering education that addresses the needs for more holistic assessments of classroom assignments designed to approximate professional practice (Brunhaver et al., 2017 in Progress; Dunsmore, Turns, & Yellin, 2011; Eliot & Turns, 2011; Turns, Sattler, Eliot, Kilgore, & Mobrand, 2012; Williams, 2002). Notably, portfolios were not discussed during the interviews. I discovered their adoption from reviewing course descriptions and outlines. Informal conversations with course instructors and Teaching Assistants provided me with the additional clarifications needed. Comparing these two sources, it appears that portfolios are underutilised by students at FEAS. The reason for this may be that little attention has

been given to the possibility of a portfolio being used as teaching tool and a pedagogical approach rather than as an assessment tool (Hamp-Lyons, 2006, 2007; Hamp-Lyons & Condon, 2000) and as cross-curriculum, multimodal active instrument rather than as a course-specific repository of written assignments (Bryant & Chittum, 2013).

In the case studies conducted by Hirvela and Sweetland (2005) on the use of portfolios by L2 learners, the authors found that when portfolios are graded, students focus their efforts on completing required portfolio tasks and get a good grade instead of reflecting on their learning-in-progress. Because students are grade conscious and do not invest time in revising drafts-in-progress (Lam, 2013a, 2013b), the value of the portfolio as a formative, or progress-oriented, self-assessment tool is often greatly diminished. Lam (2014) contends that there is a crucial need to create and nurture an 'independent learning culture' wherein students are encouraged to perform self- reflection. Based on findings from my research, I argue that instilling such culture in first-year engineering students would produce significant results both in the short and in the long-term. In line with this, Boud and Falchikov (2007) contend that students need to develop the capacity to judge their own performance in relation to the context in which that performance is embedded. Educating international co-op students in the practice of continual reflection and self-evaluation may help them better capture how, when and where their language ability develops because of their engagement with different contexts, different tasks, and different people.

As a first step, it is worth considering a requirement for international students to build a personal portfolio of artifacts and experiences gained within the context of participation in practice in both academic and professional settings (see also Boud &

Falchikov, 2006; McGarthy & Kennedy, 2013). Due to its emphasis on the development of language ability and intercultural competence, this hypothetical portfolio would be most useful if intended as complementary to the course-based communication portfolios already adopted in the program, from which the student will draw exemplary artifacts. At Memorial University, students can develop a personal ePortfolio (Memorial University & Centre for Innovation in Teaching and Learning (CITL), 2017). Alternatively, students may access the free online European Language Portfolio (ELP) developed by the Council of Europe on the CEFR scale of language ability (Council of Europe, 2003, 2011a, 2017a). The ELP was designed with the aim of helping learners give shape and coherence to their experience of learning and using languages other than their first language (Council of Europe, 2017c). ELP users are motivated by recording the linguistic and cultural skills they acquire and acknowledging their efforts to extend and diversify their language skills at all levels.

Two specific characteristics of the ELP make it an excellent exemplar of personal language portfolio for FEAS international students. First, with the ELP all competence is valued, regardless of whether it was gained inside or outside of formal education. With reference to this study, examples of competence building activities may include volunteering, part-time jobs, and student clubs as well as attendance at conferences and workshops inside or outside the university. Many opportunities for non-formal and informal learning present themselves during a work term in which students' language ability is tested against a variety of audiences and contexts. Recording of these experiences trace students' path of progress strengthening their confidence as language users and as job seekers. The second critical characteristic of the ELP is the dedicated

space allotted to intercultural awareness and experience (Little & Simpson, 2003). It is designed in a way that encourages students to ponder on their intercultural encounters in the context of their residence abroad, whether in Newfoundland or elsewhere, and in their home country, perhaps during a homebound work term (Council of Europe, 2017b). Relevant to this space are international students' observations on intercultural encounters with domestic students, which follows.

While domestic students were not formally investigated as part of this study, in closing this section I briefly address their role in the development of international students' language ability and intercultural competence. Findings from this study raised questions about the readiness and willingness of domestic students to assume the role of 'master' or 'expert' (Lave & Wenger, 1991) during collaborative classroom activities and assignments. A growing number of domestic students exhibit significant weaknesses in communication. This should raise doubts and concerns surrounding the effectiveness of their role in helping international students improve language ability. Moreover, domestic students are described as 'indifferent' towards the diverse presence on campus. This makes a case for the need to address the issue of diversity not only among faculty or university staff, as suggested by results obtained by Philpott et al. (2014), but also among domestic students since my findings corroborate the growing research in this vein (Alazzi & Chiodo, 2006; Barratt & Huba, 1994; DeCapua & Arbor, 2004; Gebhard, 2012; Green & Dixon, 2008; Lee et al., 2005).

When educating future professional engineers, the value in developing an individual's ability to effectively interact with others from diverse language and cultural backgrounds cannot be overstated (International Engineering Alliance, 2013b; NAE,

2004, 2005). This is intended as the "ability to communicate effectively and appropriately in intercultural situations" (Deardorff, 2006, pp. 247-248) and comprises both effective and appropriate behaviour and communication (Spitzberg, 1989; Spitzberg & Changnon, 2009). Collaborative classroom activities designed with the premise of situated learning (Green & Dixon, 2008; Lave & Wenger, 1991) to mirror professional practice are shaped significantly by the constraints and affordances of learners' social practices (Greeno, 2006; Johri et al., 2014). Helping all students navigate those learning contexts and appreciate good practices would have profound implications for the pedagogical success of those activities. Most importantly, it would contribute to placing the student on a path to professional success.

6.3 Implications for policy

In this section, I discuss the key policy implication generated by this study that may be relevant for FEAS and Memorial University for improving international students' outlook on the professional component of the program. I acknowledge that the policymaking process is seldom simple since, in most cases, potential conflicting influences, as well as possible financial and legal constraints, often determine the course. Nevertheless, considering this study's findings and taking into account the implications for practice just discussed, I argue that FEAS might consider a review of its current admission requirements for international student by evaluating two possible courses of action. First, FEAS may raise the minimum scores in the standardised admission tests (e.g. TOEFL, IELTS, CAEL) for the English Language Proficiency requirements (Memorial University - Office of the Registrar, 2016). The second option is, perhaps, less feasible than the first, because it is significantly more demanding. It requires the design

and administration of a program-specific pre-admission language test. Next, I summarise the strengths and weaknesses of each option.

A potential misalignment between the language ability expected of international students at the time of admission and the ability needed to complete a program is debated in the engineering education literature (Fox, 2009; Kokhan, 2013; Vinz, 2013), with some researchers questioning whether the minimum score, the threshold, acceptable for admission should be raised for international applicants entering all undergraduate programs (Bridgeman, Powers, Stone, & Mollaun, 2012; Malone, 2010; O'Loughlin, 2013). Case in point, examples of re-evaluation of admission requirements are beginning to emerge in Canada. The University of Calgary has already set its overall threshold score for admission to its undergraduate programs slightly above national averages, with those required for admission to Nursing and Education, for example, being considerably higher than those required by other faculties (University of Calgary Admissions Requirements, 2013). This suggests an apparent need to screen applicants differently for degree programs with a professional, career-ready outlook. FEAS does not enforce program-specific scores policies adopted elsewhere in Canada. Furthermore, comparatively speaking, Memorial University admission scores are notably lower than the Canadian averages, and significantly lower, for example, than those set for admission to the co-op only Bachelor of Engineering at the University of Waterloo (2016-2017).

Unarguably, increasing language requirements would represent a first step towards enrolling first-year engineering students who are overall better prepared to enter the program. However, poor language ability is rather negligible in the academic component of the program but significant in the co-op one. Raising standardised test scores would

likely prove insufficient in appropriately screening applicants for the latter. Considering examples of post-admission assessment discussed before, a case can be made for a pre-admission language assessment tailored to the co-op program. There are several advantages on international recruitment of enlisting such a qualifying assessment (Fox, 2009). It would reduce the risk of admitting first-year students with inadequate language ability. By making the language demands of the program explicit, through such test, it would increase awareness among otherwise qualified applicants of the need to develop work term specific language ability to succeed in the program. This would also translate in the students' expectations of success being more realistic and attainable upon enrollment (see e.g. Stappenbelt, 2006; Stappenbelt & Barrett-Lennard, 2007, 2008). However, the potential drawbacks resulting from this test development and delivery are also significant, particularly with respect to the allocation of resources needed to conduct the necessary research underlying test development. I discuss this study's implications for research next.

6.4 Suggestions for future research

In the previous sections I presented the main implications for practice and for policy generated by this study. Those implications are important because they point to the additional research that still needs to be conducted as part of the efforts to improve engineering education practice at FEAS. Other Canadian or foreign engineering faculties and schools that offer co-op designation and host international students may draw on my suggestions below to build their own research projects. In my research, I thought important to include three main groups of actors and stakeholders, namely students, educators, and industry, from whom I intended to capture each perspective. I

acknowledge that, although distinct, each group contributes in its own way to the success of the students and of the program, and each benefits in different ways. Future researchers interested in pursuing studies on work term language ability and intercultural competence in the context of engineering co-op programs may find focussing on one more compelling than another. Below, I provide only the main directions for future research, leaving to interested researchers the choice of on which group and what perspective to concentrate their efforts.

The engineering undergraduate co-op program is a promising site for research because it provides a platform in which students' acquisition of relevant professional communication can be studied in an almost perfectly synchronous manner as it develops in school and on the job (Division of Cooperative Education, 2015). The body of literature examined for this research is substantial. This is primarily because existing studies on professional engineering communication most often emphasise academic rather than professional contexts. As a result, the development of this competence is examined either as the end result of engineering education or as a consequence of post-graduation professional practice, with the student's graduation as the pivotal turning point where misalignments become unmistakeably evident. Important studies are being conducted on the need to bridge the gap between engineering education and practice. Among the many, exemplar is the work conducted by the team of Sheri Sheppard at Stanford University (Atman et al., 2010; Brunhaver et al., 2017 in Progress; Brunhaver et al., 2010 ; Brunhaver et al., 2015; Sheppard et al., 2008; Sheppard et al., 2011).

The team's most recent project (2017 in Progress) investigates where engineers develop the professional communication they need most to perform their job effectively.

Input from participants' own personal experience in transitioning from engineering students to working professional engineers informed the results. The team identified gaps and deficiencies left unaddressed by the education system that, as new graduates working in the industry, participants must subsequently correct. Accordingly, the authors, in line with other studies, support the integration of opportunities for formal and informal learning in the engineering academic curriculum through targeted communication courses, course-embedded teaching, teamwork, collaborative learning, and interaction with professionals. The value of providing students with direct professional experience by facilitating access to internships (Callanan, 2004), co-op assignments or direct involvement in professional societies is also highlighted. Because of the way FEAS undergraduate program is structured, it is possible to research what international (and domestic) students learn before graduating as well as where that learning takes place, whether in school or on the co-op job, informally or in the context of formal educational initiatives.

Alternating academic terms and work terms would grant researchers the opportunity to study learning in school and learning on the job neither as events occurring successively, yet described retrospectively, nor as parallel paths to graduation but rather as a single uninterrupted cycle of learning in which competence is developed in academic and professional setting. This is my vision for future research in the development of relevant professional communicative competence in engineering co-op programs. It is an approach in which competence can be studied in progress, as it builds with each work term and each step forward in the academic program. Work term placements are therefore studied as testing grounds where student's competence is evaluated as much as learning

grounds where the student can grow as effective communicator. Approached in this manner, research may lead to a timely identification of systemic gaps in students' preparation and help uncover instances of non-learning as they occur in either setting. In other words, this rather capillary investigation of academic and professional learning environments has the potential to reveal those factors that act as barriers and as facilitators to students developing language ability and intercultural competence at set points along the program continuum.

My research suggests that both contextual and individual barriers and facilitators exist. Examples of contextual factors include the intercultural sensitivity and openness of a student's peers (e.g. Anna), the willingness to accommodate students and the encouragement of work term supervisors (e.g. Supervisor 1 & 2). As findings show, the role and type of job assigned to the student by the hiring company may be a factor in the student's ability to develop professional communicative competence while on a work term (e.g. David versus Charlie). In the workplace, my findings confirm, a student's language ability plays a pivotal role in the creation of opportunities for social interaction (Anant, 2010; Chamberlin-Quinlisk, 2010; Holmes, 2000b), and in the execution of daily professional exchanges (Holmes & Riddiford, 2011). Indeed, as seen in the accounts of co-op students' supervisors, everyday conversations, small talk, humour can have a big impact on how someone is perceived by colleagues (Holmes, 2005; Holmes & Marra, 2002). It may have a significant effect on the integration and socialisation processes of that student, impacting not only her learning potential but the overall quality of the co-op experience for both the individual and the company.

Among individual factors, researchers may consider broadening current research on international students' self-segregation on campus for the investigation of this phenomenon in the co-op workplace. As Chen argues (2008), lack of mastery of the English language compromises individual's desire and intention to communicate, likely interfering with learning various aspects of life in the host country, including access to essential employment information. Existing research contends that an international student may subjectively choose whether and to what extent to embrace the culture of the host country (Anant, 2010; Chamberlin-Quinlisk, 2010; Molinsky, 2010, 2013; Vinay, 2009). Further studies on the effects on work term success of a student's decision not to "engage in behaviour that violates or conflicts with his or her personal values and beliefs" (Molinsky, 2010, p. 728) are enlightening. As Molinsky (2010) observes, such willingness varies depending on the situation and the purpose of the interaction. Therefore, he contends, research that focuses on the process of acculturation would be better served by the adoption of a situational approach rather than the widely adopted U-curve (Lysgaard, 1955) or the Berry's dual identification models (Berry, 2003). Accordingly, the situational approach may help identify the specific situations in which "one thrives versus those in which one struggles" (Molinsky, 2010, p.726).

It is argued that international students master specific situations they regularly "encounter in their daily life at work, at school or in social settings, differently in different moments and at different times in their life" (Molinsky, 2010, p. 728). The myriad unique situations a FEAS co-op international student encounters while in the program warrants the adoption of a situational approach. Research designed around Molinsky's approach (2007, 2010, 2012) may reveal important clues about how

international students adapt to unfamiliar academic and professional settings and how they respond to communication and intercultural challenges within each context. In situated learning, novices progressively develop competence in communicating within the context of a particular community by interacting with more experienced members of that community (Johri et al., 2014; Lave & Wenger, 1991). Accordingly, I see further research in this vein investigating the types of audiences with which FEAS international students interact and improve through socialisation (Schieffelin & Ochs, 1986). In engineering communication research, and in practice at FEAS, interaction with domestic coursemates or co-workers bears most of the responsibility for developing language ability in international students. Who else contributes to students becoming good communicators is worthy of investigation.

Future research aimed at improving our knowledge of how international co-op students become socially competent language users must consider existing resources and opportunities within their academic and professional communities. Especially since the communicative practices that novices learn through situated learning and which allow them to move move from peripheral to full participation in the community (Lave & Wenger, 1991), are "culturally appropriate" (Schieffelin & Ochs, 1986, p. 166). Molinsky's studies are centred on international students developing culturally appropriate communicative practices associated with formal, non-formal, and informal day-to-day life events and activities. Clearly, this unilateral view is important in research that focuses on the "experience of international student in dealing with authentic communication" (see e.g. CCLB, 2015c, p. 15). However, language socialization must be considered as a bilateral interaction whereby "all parties are agents in the formation of competence"

(Schieffelin & Ochs, 1986, p. 6). Hence, while international learners should strive to avoid "becom[ing] fluent fools", as Bennett observed (2008, p. 17), further research should investigate how their interlocutors on campus and on the job respond to them as culturally diverse students (Engle & Engle, 2004; Freed, 1998; Llanes & Muñoz, 2009; Rees & Klapper, 2007; Williams, 2005).

Intercultural misunderstandings are often interpreted as failure of communicative competence and are used to reinforce negative stereotyping while justifying social exclusion (Martín Rojo, 2010). Further study is needed to shed light on the often-hidden dynamics that drive one cohort to exclude the other on campus (Otten, 2003; Sheridan, 2011; Spencer-Oatey & Dauber, 2015; Swaminathan & Alfred, 2001). Furthermore, as Barak (2017) points out in her research on diversity management "one of the most significant problems in the workplace is exclusion" (p.5). That comprises both social exclusion and the implicit or explicit exclusion of individuals or groups "from job opportunities, information networks, team memberships, and decision-making process" (p.5). Research into whether this workplace problem is mirrored in academia could yield compelling results should findings show that some international students are excluded from important sources of relevant knowledge and information while in school. It has the potential to generate valuable input for the design and implementation of ad hoc diversity training programs, as several participants in my research called for improvements to the current practices for the gathering and distribution of information relevant to work terms among all students.

In 2015 Memorial University published its "Strategic Internationalization Plan 2020 (SIP)" (Memorial University & Office of the Vice-President (Research), 2015) to

complement the already mentioned "Internationalization White Paper" (Knutson et al., 2014) and the report on international students by Philpott et al. (2014). The SIP links intercultural competence and internationalisation at Memorial. No longer a prerogative of entrant international students, intercultural competence is now to be regarded as an explicit outcome of postsecondary education (see e.g. Deardorff, 2004; Deardorff & Jones, 2012). All students, faculty members and personnel need to be educated as "global citizens" as argued by Deardorff, de Wit, and Heyl (2012, p. 458) and again in Memorial SIP (p.3). From this perspective, the SIP highlights seven themes for strengthening Memorial's internationalization efforts and sets the "stage for a wide range of ambitious international and intercultural initiatives" (p.3). Within the SIP's themes, novel approaches can be tested and empirical research on international students achieving effectiveness and appropriacy in communication can be co-located. Namely, Memorial's commitment to internationalisation provides a platform for researching diversity beyond simple demographic composition of nationality, race or gender (Hunt, Layton, & Prince, 2015).

Coexistence does not automatically lead to intercultural contacts (Otten, 2003; Spencer-Oatey & Dauber, 2015). Further study is needed into the intercultural interactions among students of different languages, races, ethnicities, or genders, with the premise that if students do not actually interact with one another and avoid working together, the benefits of diversity may be lost (see e.g. Engle & Engle, 2004; Freed, 1998; Llanes & Muñoz, 2009; Rees & Klapper, 2007; Williams, 2005). Accordingly, at FEAS, patterns of intercultural interactions should be studied at both individual and team levels, where participation to a team's activities and decision-making processes may be curtailed.

A case in point, Anna's experience at FEAS provides just one example for future diversity studies investigating the grounds for speculation about nationality, race, language ability, and, indeed, gender bias affecting interactions. According to Hunt et al. (2015), diversity "is best achieved through dedicated programmes that focus on specific goals" and through differentiated "initiatives by diversity group" (p.14). Increasing our knowledge and understanding of patterns of interaction between international students and domestic peers, faculty members, and personnel may inform the design and implementation of SIP initiatives (p.3) by potentially revealing overt and covert intercultural issues at FEAS and Memorial.

Regarding intercultural competence in educational contexts, one area that researchers describe as still problematic and underdeveloped is assessment of progress (Crichton & Scarino, 2011; Liddicoat et al., 2003). This is, in part, due to questions concerning the effectiveness and reliability of existing instruments compared to those available for assessing language ability (Byram, 1997). Widely adopted approaches that use tests of target culture (multiple-choice or cloze), for example, are considered inadequate for the task. Developed on the premise of the traditional knowledge-transfer approach, these tests ultimately over-simplify and misrepresent the learner's ability in order to ensure objectivity in measurement (Byram, 1997; Byram & Risager, 1999; Sercu, 2001, 2004; Sercu & Bandura, 2005). Moreover, if one agrees that knowledge and understanding are only two components of intercultural competence, assessment using these methods is incomplete (Byram et al., 2002). Notwithstanding 'subjectivity' and reliability concerns (Byram et al., 2002), portfolios and other similar forms of assessment of learner's intercultural experience and awareness are preferable (for adaptable templates

see Council of Europe, 2003, 2011b). Considering the singularity of the case studied here, further research into ways to best operationalise intercultural competence at FEAS is warranted and needed.

For example, research on FEAS would require moving beyond the idea of assessing progress in intercultural competence within the traditional context of formal ESL/language education. Thus, allowing for the removal of the idea of one teacher put in charge of teaching and assessing intercultural competence. Another question for investigation is who, then, establishes what can be considered interculturally appropriate and effective behaviour that FEAS international students should learn and exert? Establishing generalised criteria of appropriacy is problematic if one considers that many judge FEAS international students' intercultural behaviour in different contexts, scenarios, and situations. To answer the question, future research could be directed at identifying and defining a range of intercultural expectations within the boundaries of co-op relevant academic and professional settings. The output of such research could map scenario alternatives where intercultural competence is essential for the successful outcome of high stakes interaction. Based on this study, two clear examples come to mind, namely the collaborative course-based activities and work term recruitment. In delineating such a study, researchers could identify a relatively manageable space on which to develop and implement targeted initiatives and more easily monitor consequent intercultural progress, alongside language ability.

Researchers explored the development of descriptors-based scales of intercultural competence to complement those which exist for CEFR language ability (Bruen et al., 2010; Bruen & Sudhershan, 2009; Little & Simpson, 2003). Their work rests on the

argument by Byram (1997, 2002), that components of intercultural competence (knowledge, skills, and attitudes) can too be expressed in Can Do descriptors (see Byram et al., 2002, p. 31 for examples). As Byram observes (2002, 1997), intercultural competence models (e.g. Berry, 1970, 2003; Lysgaard, 1955) are designed to illustrate progress in acculturation but fall short in the "scalar" representation of learner's progress available for language ability (6-point scale in CEFR, 12- point scale in CLB). A viable solution could be to limit the development of descriptors to establish a threshold (i.e. pass/ fail) at or above which a learner can be considered interculturally competent (Byram, 1997; Sercu, 2004). These threshold Can Do descriptors would necessarily be highly context-specific to reflect varying emphasis on certain components as dictated by the circumstances in question (Byram, 1997). The program at FEAS provides interested researchers with an ideal platform to develop such threshold descriptors for assessment. However, I argue, alternative approaches and solutions should also be considered.

Findings suggest that FEAS does not appear to attribute a high degree of importance to producing evidence of students' learning of intercultural competence. This is despite several interviewees' comments on the critical need of entrant foreign students to develop this competence immediately after, if not before, enrolling in the program. Whether formal teaching and assessment for all students should be implemented has some investigative value given the intercultural initiatives promoted by Memorial SIP (2015). Research in this vein could seek to elicit all FEAS students' opinion on how intercultural competence should be approached in educational contexts by presenting two possible courses (Yershova et al., 2000). According to Yershova et al. (2000), the problem oriented approach, or "fix-the-problem approach" (p.43) is perhaps the most traditional

and still widely adopted. The second is the approach that conceptualises the acquisition of intercultural competence as a developmental process of "learning and personal growth" (p.43). Analysed comparatively, results yielded by each student cohort may ultimately reveal important clues on how students position themselves towards intercultural communication and as interlocutors in intercultural interactions.

Yershova et al. (2000) explain that the first approach finds its rationale in the very practical concerns associated with the need to help international learners adjust to the unfamiliar cultural environments of the host country, institution, and workplace. This approach views "cultural differences as impeding or detrimental to effective intercultural performance" (p.44). It may be argued that this approach supports the development of intercultural descriptors for teaching and assessment purposes mentioned above (see e.g. Murphy-Lejeune, 2007). Central to this approach is "adjusting certain attitudes and modifying certain behaviours" (p.45). Based on my findings, if one considers how co-op coordinators manage the intercultural difficulties of foreign students in view of work term recruitment, this is the approach that seems to prevail at FEAS. Conversely, the developmental perspective views becoming interculturally competent as a process of change and transformation (see e.g. Bennett, 1993 Developmental Model of Cultural Sensitivity) supported by continuous increase in cultural (self-)awareness, "reflection and analysis" (Yershova et al., 2000, p.45). By its nature, this approach defies rigorous assessment that presupposes progress in discrete steps. Instead, progress can be observed in the individual's deepening of understanding of intercultural phenomena by personal experience (Molinsky, 2007, 2010; Molinsky, Krabbenhoft, Ambady, & Choi, 2005; Ting-Toomey, 1999).

Strengths and weaknesses for either approach can be debated in future research. Nevertheless, in this dissertation I seek improvements to current FEAS pedagogical strategies that harmonise with its established tenets and pedagogical paradigm. Accordingly, I argue that the perspective of the developmental approach is most consistent with the notion of educating maturing prospective engineers and the premise on which that rests. With ethical considerations beyond the scope of this dissertation, in line with Sercu (2004), I contend that the practice of assessing students' intercultural competence risks fostering a culture of juxtaposition between desirable and undesirable attitudes, behaviours, and, potentially, personality traits. As a result, international students may perceive that they are penalised for not fitting an ideal. Instead, future research at FEAS may be directed at piloting the adoption of the Autobiography of Intercultural Encounters (Council of Europe, 2003, 2011b, 2009, 2014a) – the component of the European portfolio that specifically addresses intercultural competence. The Autobiography could be piloted as a tool for the faculty and the student to monitor the student's development of intercultural competence in the context of situated learning as it takes place within the program classroom activities as well as during co-op recruitment competitions and in the workplace during work term placements.

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Appendix A

(CEFR) Global scale - Table 1 (CEFR 3.3): Common Reference levels

For some purposes it is appropriate to summarise the set of proposed Common Reference Levels in a table (Council of Europe, n.d.). Below is a simple 'global' representation of CEFR Levels intended to make it easier to communicate the system to non-specialist users and provide teachers and curriculum planners with orientation points.

PROFICIENT USER	C2	Can understand with ease virtually everything heard or read. Can summarise information from different spoken and written sources, reconstructing arguments and accounts in a coherent presentation. Can express him/herself spontaneously, very fluently and precisely, differentiating finer shades of meaning even in more complex situations.
	C1	Can understand a wide range of demanding, longer texts, and recognise implicit meaning. Can express him/herself fluently and spontaneously without much obvious searching for expressions. Can use language flexibly and effectively for social, academic and professional purposes. Can produce clear, well-structured, detailed text on complex subjects, showing controlled use of organisational patterns, connectors and cohesive devices.
INDEPENDENT USER	B2	Can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisation. Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options.
	B1	Can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. Can deal with most situations likely to arise whilst travelling in an area where the language is spoken. Can produce simple connected text on topics which are familiar or of personal interest. Can describe experiences and events, dreams, hopes & ambitions and briefly give reasons and explanations for opinions and plans.
BASIC USER	A2	Can understand sentences and frequently used expressions related to areas of most immediate relevance (e.g. very basic personal and family information, shopping, local geography, employment). Can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters. Can describe in simple terms aspects of his/her background, immediate environment and matters in areas of immediate need.
	A1	Can understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type. Can introduce him/herself and others and can ask and answer questions about personal details such as where he/she lives, people he/she knows and things he/she has. Can interact in a simple way provided the other person talks slowly and clearly and is prepared to help.

Appendix B

Letter of ethical clearance

Below is the letter granting the study full ethics clearance issued by Memorial University Interdisciplinary Committee on Ethics in Human Research (ICEHR).

MEMORIAL UNIVERSITY

Interdisciplinary Committee on Ethics in Human Research (ICEHR)

Office of Research - IIC2010C
St. John's, NL Canada A1C 5S7
Tel: 709 864-2561 Fax: 709 864-4612
www.mun.ca/research

ICEHR Number:	**20150116-IO**
Approval Period:	August 29, 2014 – August 31, 2015
Funding Source:	N/A
Responsible Faculty:	Dr. Xuemei Li Faculty of Education
Title of Project:	*Toward Enhancing Intercultural Communicative Competence for International Engineering Students*

August 29, 2014

Ms. Christina Fabretto
Interdisciplinary Ph.D. Program
School of Graduate Studies
Memorial University of Newfoundland

Dear Ms. Fabretto:

Thank you for your email correspondence of August 7 and 28, 2014 addressing the issues raised by the Interdisciplinary Committee on Ethics in Human Research (ICEHR) concerning the above-named research project.

The ICEHR has re-examined the proposal with the justifications and revisions submitted, and is appreciative of the thoroughness and clarity with which you have responded to the concerns raised by the Committee. In accordance with the *Tri-Council Policy Statement on Ethical Conduct for Research Involving Humans (TCPS2)*, the project has been granted *full ethics clearance* to August 31, 2015.

If you need to make changes during the course of the project, which may raise ethical concerns, please forward an amendment request form with a description of these changes to icehr@mun.ca for the Committee's consideration.

The *TCPS2* requires that you submit an annual update form to the ICEHR before August 31, 2015. If you plan to continue the project, you need to request renewal of your ethics clearance, and include a brief summary on the progress of your research. When the project no longer requires contact with human participants, is completed and/or terminated, you need to provide the annual update form with a final brief summary, and your file will be closed.

The annual update form and amendment request form are on the ICEHR website at http://www.mun.ca/research/ethics/humans/icehr/applications/.

We wish you success with your research.

Yours sincerely,

Gail Wideman

Gail Wideman, Ph.D.
Vice-Chair, Interdisciplinary Committee on Ethics in Human Research

GW/th

copy: Supervisor – Dr. Xuemei Li, Faculty of Education

Appendix C

Recruitment email message

Below is the text of the recruitment email sent out to solicit participation of international engineering students to the study as approved by Memorial Ethics Committee ICEHR.

Hello,

Do you find that international students like you face particular challenges when competing for work term jobs? Do you agree that English competence and intercultural skills affect the success of international engineering students in co-op work recruitment? But do you know how, why or how much?

I am an Italian Interdisciplinary Ph.D. student at Memorial and I am conducting a research among international Engineering students (undergraduate) like you at Memorial. I am an international student as well and I research the gap between what recruiters and employers expect of international co-op students and what students can offer in term of English language and intercultural competence. I am particularly interested in knowing your point of view on this issue.

If you want to help me in this research, please contact me at my email below and allow me to interview you. I designed the interview to allow you to share only the information you are comfortable sharing, and I will guarantee in writing that your identity and privacy will be protected at every stage of the research. Your participation will have no effect on any other services to you, and your supervisors, professors, directors, coordinators, advisors etc. will not have knowledge of your participation in this research. So, email me at fabretto@mun.ca.

I look forward to meeting you and thank you very much for your help.

Cristina Fabretto

Interdisciplinary Ph.D. student (Education, Linguistics, Intercultural Communication)
Memorial University of Newfoundland - St. John's Campus Email: fabretto@mun.ca

Appendix D

Informed consent

Below is the text of the Informed Consent that each participant to this study signed prior to commencing the interview.

DATE

Informed Consent Form

Title:	Toward Enhancing Intercultural Communicative Competence for International Engineering Students (working title).
Researcher:	Ms. Cristina Fabretto, Interdisciplinary Ph.D. student, School of Graduate Studies- Memorial University of Newfoundland. Email: fabretto@mun.ca.
Supervisor:	Dr. Xuemei Li, Assistant Professor, Faculty of Education. Phone: 709-864 6224; email: xuemei.li@mun.ca.

You are invited to take part in a research project entitled "Toward Enhancing Intercultural Communicative Competence for International Engineering Students (working title)".

This form is part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. It also describes your right to withdraw from the study at any time. In order to decide whether you wish to participate in this research study, you should understand enough about its risks and benefits to be able to make an informed decision. This is the informed consent process. Take time to read this carefully and to understand the information given to you. Please contact me, the researcher, Ms Cristina Fabretto, if you have any questions about the study or for more information not included here before you consent.

It is entirely up to you to decide whether to take part in this research. If you choose not to take part in this research or if you decide to withdraw from the research once it has started, there will be no negative consequences for you, now or in the future.

I am an Italian-Canadian Interdisciplinary Ph.D. Candidate at Memorial University. As part of my Doctoral thesis, I am conducting research under the supervision of Dr. Xuemei Li, Dr. Anne Thareau and Dr. Gerard van Herk. I am inviting you to participate in my study the purpose of which is to identify and establish the threshold at or above which international engineering students can be considered both linguistically and interculturally competent to succeed in a work-term selection. The threshold will result from the alignment of two sets of performance descriptors: The Foreign Language "Can Do" descriptors that are widely used worldwide, and the intercultural "Can Do" performance descriptors, that have not been found in current literature and will be developed as a result of this study. This interview seeks the industry perspective on the language and intercultural performance asked of international engineering students as work term candidates. This perspective, along with the others that I will collect during this research will comprise the "Can Do" descriptors mentioned above.

The interview should last less than 1 hour (from start to finish). With your permission, the interview will be audio- recorded to allow me to review it afterwards. If, at any time during the interview, you should change your mind or feel uncomfortable, you will be free to stop the interview and withdraw from the study. There will be absolutely no consequences for you if you decide to withdraw. In case of withdrawal all data regarding your participation to this research will be immediately destroyed. Your confidentiality will be still protected as if you had completed the study. I can assure you that during and after the study your identity will be kept confidential and every reasonable effort will be made to ensure your anonymity. I will assign a code to your interview transcripts to protect your identity. The

data I will collect, including the emails you and I will exchange, will be stored in a locked filing cabinet in my personal office at home.

I cannot foresee any potential physical, emotional, or financial risk you or your company would incur by participating in this study. On the other hand, your opinion is important and will be valued. Your contribution will enable to shed light on job training and the facilitation of workplace communication. Academic research will greatly benefit from your input, especially research on education and training in English as a Second Language and intercultural competence, which is extensive and growing. This research is expected to bring to the attention of the scholarly community potential alternative cost and time- effective solutions to current approaches.

I will be reporting the results of my research findings in research reports, scholarly journal articles, books, conference presentations, and workshops. Results may also be shared with Memorial University. In these writings, I will summarize the results and, with your permission, I might choose to insert some quotations. Even such quotations will be anonymous and will not contain any reference to the speaker/ participant to avoid any possible identification with the participant. All identifying information will be removed from the collected materials and all materials will be stored securely in a locked filing cabinet in a secure location. As required by Memorial University policy on Integrity in Scholarly Research data will be kept for a minimum of five years.

Your signature on this form means that:

- You have read the information about the research.
- You have been able to ask questions about this study.
- You are satisfied with the answers to all your questions.
- You understand what the study is about and what you will be doing.
- You understand that you are free to withdraw from the study at any time, without having to give a reason, and that doing so will not affect you now or in the future.
- If you sign this form, you do not give up your legal rights and do not release the researchers from their professional responsibilities.

Your privacy and confidentiality of the data collected during this research will be maintained throughout the duration of this study, including in the article that will be written on the results. That means that your identity will be kept confidential at all times: I will assign a code to your interview transcripts to protect your identity. I will make every reasonable effort to assure that your anonymity will be kept and that you will not be identified in any reports and publications without your explicit permission.

All electronic documents will be password protected and stored in a memory stick which will be locked in the same filing cabinet where all documents will be stored. As per Memorial University Policy on Integrity in Scholarly Research documents and data pertaining to every research must be kept for a minimum of five (5) years. Therefore, after five years from the completion of this study, all related documents and electronic memories will be physically destroyed.

You are welcome to ask questions at any time during your participation in this research. If you would like more information about this study, please contact: Cristina Fabretto, fabretto@mun.ca

The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in Human Research and found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about the research (such as the way you have been treated or your rights as a

participant), you may contact the Chairperson of the ICEHR at icehr@mun.ca or by telephone at 709-864-2861.

Consent:
Your signature on this form means that:

- You have read the information about the research.
- You have been able to ask questions about this study.
- You are satisfied with the answers to all your questions.
- You understand what the study is about and what you will be doing.
- You understand that you are free to withdraw from the study at any time, without having to give a reason, and that doing so will not affect you now or in the future.
- You understand that any data collected from you up to the point of your withdrawal will be immediately destroyed.

If you sign this form, you do not give up your legal rights and do not release the researchers from their professional responsibilities.

Your signature:
I have read and understood what this study is about and appreciate the risks and benefits. I have had adequate time to think about this and had the opportunity to ask questions and my questions have been answered.

☐ I agree to participate in the research project understanding the risks and contributions of my participation, that my participation is voluntary, and that I may end my participation at any time.
☐ I agree to be audio-recorded during the interview.
☐ I agree to the use of quotations without my name to be identified in any publications resulting from this study.

A copy of this Informed Consent Form has been given to me for my records.

Signature of participant _____ Date _____

Researcher's Signature:
I have explained this study to the best of my ability. I invited questions and gave answers. I believe that the participant fully understands what is involved in being in the study, any potential risks of the study and that he or she has freely chosen to be in the study.

Signature of Principal Investigator _____ Date _____