ICT Proficiency Levels of Canadian University-Level Business School Graduates: Representations of Graduates and Employers

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Received: August 23, 2021 Accepted: October 8, 2021 Online Published: October 20, 2021

doi:10.5430/jbar.v10n2p73 URL: https://doi.org/10.5430/jbar.v10n2p73

Abstract

This study examines the perceptions of Canadian business school graduates' and employers with respect to business graduates' ICT proficiency levels. Twelve (12) business graduates from a Canadian university and six (6) local employers were interviewed on a range of topics relating to the acquisition of information and communications technology (ICT) skills and graduate competency levels. Graduates were positive in their self-appraisal of computing proficiency and expressed high levels of confidence in their ICT capabilities, while the acquisition of these skills was found to be primarily learned informally, self-taught, or learned during work terms. Generally, employers felt that the ICT competencies of business graduates the skills they need for the workplace are appropriate, but indicate that some specialized ICT skills are acquired through workplace orientation and ongoing professional learning. Graduate skill deficits were found to be more prevalent in the areas of writing and communication – including spelling, grammar, and business writing. Research findings suggest some misalignment between employer expectations and program objectives and raise questions about a potential gap in the readiness of graduates for the workplace. Although there is wide recognition that the primary aim of university business degree programs falls outside of ICT skill development, this research suggests a need for better coordination to align the needs and expectations of employers with the goals and objectives of business programs. Strategies for greater collaboration between business faculties and employers, with regard to business graduates' ICT and other key competencies are suggested.

Keywords: information and communication Technology, employers, business graduates, computing skills, proficiency

1. Introduction

After some fifty years of progressive integration, computers, and ICTs generally, are widely recognized as essential tools in virtually all facets of life. The International Telecommunication Union (ITU), the United Nations agency that oversees international communications, reports that in 2020 just over half the world's population was using the Internet and 93 percent had access to a mobile-broadband network (ITU, 2020). Given the ubiquitous nature of computer technology, there is a common perception that frequent computer usage equates to strong computer skill levels, but this assumption may misrepresent the proficiency levels of university graduates and their readiness to enter corporate work environments that typically require robust computing skill levels (McLester & McIntire, 2006).

Johnson, et al. (2006), assert that proficiency in computer applications and data management are key competencies expected of business school graduates. Employers, especially those in new start-up businesses, must be nimble in order to compete in the marketplace. Costly onboarding, including training and supervision of new employees who may have limited technical and workplace skills is cited as the main reason why employers are cautious about accepting business student placements (Sattler & Peters, 2012). According to Tinado and Do (2018, p. 9), the single greatest challenge for employers who participate in work-integrated learning opportunities such as co-operative (co-op) programs is "the amount of staff time it takes to recruit, train and supervise co-op students." This research points to a renewed and robust role for business schools in preparing graduates with strong ICT skills for a highly dynamic labour market.

As new technologies applications progress and evolve, the human resource requirements of highly competitive, technology-oriented businesses are expected to intensify the challenges of preparing business graduates to enter the job market. Tibando and Do (2018) report that the employers in their study identified a need for graduates with

specific technical requirements and highly specialized skill sets, but acknowledge that technical skill sets change rapidly, are continuously evolving, and can quickly become obsolete. These issues are more concerning for small and medium size enterprises (SMEs) that typically have less capacity to undertake workplace training, but which also account for the vast majority of jobs in the Canadian technology and business sectors (Government of Canada, 2020). Other challenges associated with matching the skill sets of business graduates with the needs of employers are more common to universities themselves. Some authors have argued that there is a cultural and contextual mind-set in universities that separates them from the labour market, and more particularly, the business sector (Siegal, et al., 2003; Wells, 2012; Wallin et al., 2013). If Canadian universities are to bridge this chasm to the benefit of business graduates and their employers, Wells (2012) stresses a need to change this perspective and embrace the concepts required to support local start-ups and SMEs.

Compounding the problem of understanding the computer skill needs of business is the difficulty in acquiring reliable data. Information on skill deficits in the business sector has been unreliable, partly due to a rapidly changing economic landscape, but also because the mechanisms in place for industry to signal their human resources requirements are inadequate (Sattler & Peters, 2012) and university-industry collaborations are weak and ineffective (Wallin et al., 2014). Tibando & Do (2018, p. 5) observe that a "clear, reliable and real-time understanding of skill demand by employers" is essential in order for education programs to be relevant.

Questions relating to the level of graduate ICT proficiency and the ways in which computer skills are acquired are, therefore, vital to both employers and business faculties. This is an important area of inquiry; however, research on the computing competencies of business graduates and the corresponding expectations of employers in the Canadian context, is very limited. The main purpose of this qualitative study was to investigate the representations of university-level business graduates with respect to their perceptions of their own computer competencies and preparedness to enter the workplace and how such competencies are acquired. In addition, we were interested in learning about employer perceptions of the ICT skill levels of business graduates, and the of role of business schools in developing these competencies. To this end, this study is guided by the following research questions:

1) How do Canadian business school graduates represent their level of ICT competency, how do they acquire these skills and how do they represent the role of business schools in developing ICT knowledge and skills?
2) How do employers represent the level of computing knowledge and skills expected of new business graduates and to what extent do recent business school graduates possess these skills?

2. Theoretical and Conceptual Framework

This qualitative investigation is situated within a constructionist epistemology, specifically and contextually, within the interpretive theoretical framework of phenomenology (Crotty, 1998). Phenomenological inquiry involves the study of structures of experience, or consciousness. As a theoretical orientation phenomenology conceives of knowledge as coming into being through a researcher(s) interpretation of how individuals see, comprehend and decipher experiences in their lives (Rawlings & Cowell, 2015). Data from conversations or interviews are actively constituted by the intervention of the researcher(s) with research participants and would otherwise not exist. The benefit of a phenomenological theoretical perspective is the ability to investigate and examine a problem through a participant's perspective and to acquire data on how an individual sees and comprehends the situation they are experiencing (Lester, 1999). This approach underlines the significance of deciphering participants' impression of the importance of a life event, meaning that their view is framed by their connection with the reality of their lived experiences (Lester, 1999; Crotty, 1998). Researcher interpretations of the perspectives of business graduates and employers concerning computing proficiency is central to this research. Interpretation of the self-perceptions of ICT knowledge, skills by business graduates and the computing competencies employers expect business graduates to demonstrate will enable us as researchers to evaluate the level of coherence between expectations and preparedness.

This study is further guided by a conceptual framework described by Peeters et al. (2017) as the 'employability capital matrix.' Employability capital refers to the set of personal resources—or capital—that may impact individuals' employability or position in the labour market. Peeters et al. (2017) conceptualize employability capital as similar to mobility capital (Forrier et al., 2009), but broader. Employability capital includes knowledge, skills and attitudes (KSAs) that are critical for an individual to *acquire and retain* a position in the labour market, as well as those personal characteristics (mobility capital) that enable an individual to successfully *change* jobs or otherwise achieve employment mobility. Peeters et al. (2017) also recognize that KSAs may also be augmented by social networks as a fourth category of employment capita within the matrix. In this research we conceptualize the knowledge and skills associated with ICT proficiency as fundamental to the school to work transition of business school graduates. Within the employability capital matrix, they represent two of the four categories of employability capital.

3. Literature Review

An initial search was conducted to determine the scope of the extant literature in the field and identify general themes. We reviewed research studies and other sources of information from books, journals, technical reports and other scholarly sources as well as news websites and trade journals. At the data analysis phase, we conducted a secondary search to capture any other studies that were published since the first search was undertaken. The following review is organized according to three themes: industry expectations of ICT proficiency of new graduates; graduate self-perceptions of ICT competencies, and; the role of business schools in ICT skill acquisition.

3.1 Industry Expectations of ICT Proficiency of New Graduates

Consistently, throughout the research we reviewed, there was broad agreement that facility with computers is one of the key employability competencies for graduates generally, and particularly for business and IT graduates (Jewell, et al., 2020; McLester & McIntire, 2006; Murray, et al., 2007; Schuetzler, et al., 2019; Wallace & Clariana, 2005). However, the literature also points to some ambiguity in what employers identify and expect, in terms of ICT knowledge and skills. In addition, we found evidence that business graduates lack confidence in their ICT proficiency, particularly with respect to higher-level ICT competencies.

Although numerous sources (e.g., Canadian Science Policy Conference; 2015; Farjaryoti, et al., 2020; Green, 2012; Hadziristic, 2017) have underscored that every future career – even non-ICT positions – will require robust digital literacy skills, the question of whether there is a requisite or standard set of ICT competencies that should be common to business graduates has not been widely investigated in the research literature. The identification of a common skill set would help inform school-to-work transition policies and practices in the field of business education, but most of what we know about ICT competencies is more generic and poorly defined. The Conference Board of Canada publishes a set of general employability skills under the headings, *fundamental skills*, *personal management skills* and *teamwork skills.* Among the general skills stipulated by the Conference Board there are references to sharing information using a range of ICTs (e.g., voice, e-mail, computers) and 'locat[ing], gather[ing], and organi[ing] information using appropriate technology and information systems.' Beyond these lower level, generic skills there is no reference to specific of higher-level ICT competencies and no analysis by occupational area.

According to Hadziristic (2017, p. 12), the dominant question emerging from her review of the literature on digital literacy in Canada is not whether prospective employees can access the internet, but "whether they can adequately use and understand the changing digital technologies that increasingly define the workplace." Farjaryoti, et al's (2020) systematic literature review of employability skills stated that employers expect their employees to acquire the necessary skills and knowledge to produce results and to maintain and improve performance. Farjaryoti and his colleagues examined 66 journal and conference proceedings articles and found that the most common employability skills cited by employers are *problem solving skill, team work, communication* and the *use of technology*. They speculate that the labour market of the future will be dominated by soft skills and technological skills, but were unable to be more specific on the substance of these technological skills concluding that "most researchers only give some simple pure expressions and general comments." (Farjaryoti, et al., 2020, p. 602).

Other articles were similarly generic in identifying the employability skills needed by corporations and SMEs. Jayaram et al. (2014) identify three key forms of employability skills: cognitive, non-cognitive, and technical. They confirm the importance of cognitive and technical skills in the workplace, but note that non-cognitive skills such as flexibility, and the ability to communicate and problem solve may be equally or even more important. Other systematic reviews of IT focused employability skills (e.g., Misra & Khurana, 2017) confirm the importance of cognitive (e.g., higher order thinking and problem solving) and non-cognitive skills (e.g., interpersonal relations, team work, character and self-management) skills, but rank technical skills (e.g., reading, writing, speaking, numeracy and technological skills) higher in their skills categorization.

In terms of employer's perceptions of graduate ICT competencies, with the exception of graduates in the applied technology fields, the level of computing skills of university graduates is often seen as inadequate (Schuetzler, et al., 2019). Reasons for the lower-than-expected competency levels are speculative. Gibbs, et al, (2011a), note that there is little compulsion for students to take ICT courses offered in high school because they are generally classified as electives. Jewell, et al., (2020), working in the Australian context examined how academic IT skills converted into the business setting by conducting interviews with employers and recent graduates working. They studied a range of information technology skills typically taught in preparing business students for the work environment. Their research recognizes that there are explicit IT tools, systems and procedures that can inform practical curriculum innovations to help business graduates prepared for world of work. The authors confirm that IT literacy is seen by employers as one of the most significant graduate characteristics. They assert that IT skills are fundamental for

employees in data-rich business settings, and choosing, orchestrating and utilizing that information gives graduates a competitive advantage. Employers prefer workers who are computer literate because they are perceived to be more productive and efficient at work than those who are not (Gupta, 2006).

Wallace and Clariana (2005) charge that business students lack the essential computer knowledge, skills, and capacities to find employment after their college degree programs and argue that first year business students need to build capacity in ICT concepts and programming applications and do so incrementally. Similarly, Johnson, et al., (2006) argue that business students should pay more attention to IT competencies and situate themselves so that they can demonstrate improved comprehension of IT concepts as they advance through each phase of their business programs. Other research has suggested that new entrants to the job market may be skilled in the practical use of some common software applications but employers are often dissatisfied with their technical abilities, including the level of IT skills (McLester & McIntire, 2006).

3.2 Graduate Self-Perceptions of ICT Competencies

In general, the research we reviewed is fairly consistent – to acquire and retain a position in a professional work environment, university graduates, especially business school graduates, are expected to be knowledgeable and fluent in the use of ICT applications. While some ICT skills can be gained through incidental learning (Mitra 2000, 2003; Mitra and Rana 2001; Mitra et al. 2005; Mitra, 2017), growing up as a digital native does not guarantee that students develop the requisite computing skills for entry to the world of work, by the time they graduate. Several studies that have investigated self-perceptions of ICT knowledge and skills, and efficacy in using computing applications, point to KSA deficits and misalignment with employer expectations (e.g., Ballantine, et al. 2007; Gibbs et al., 2011a; Gibbs et al., 2011b; Hakkarainen et al., 2000; Rainsbury et al., 2002.

Rainsbury, et al. (2002) examined student rankings for a range of employability skills and found that business school graduates ranked 'hard skills' (e.g. writing, math, reading and the ability to use software programs) as more important than soft skills, such as listening, social interchange and getting along with others, while computer literacy was determined to be the most important skill for the workforce. Gibbs and her colleagues, working in the New Zealand context, investigated the potential gap between business graduates' self-perceptions of computing proficiency and employer expectations, based on the ICT requirements for advertised jobs (e.g., Gibbs et al., 2011a; Gibbs et al., 2011b). They reported that typically, people tend to overestimate computer competency levels in relation to their actual skill levels and the computing expectations of employers. Many students start their university degrees with a high level of confidence in their computer skills, but often need detailed instructions in order to complete required tasks (Gibbs, et al., 2011).

Kaminski, et al. (2009) reported findings from a large-scale survey of first year students' familiarity with IT and followed up four years later, in their graduating year. They estimated students' self-perceptions of their capability in fundamental information technology knowledge and skills, (for example, word-processing and using presentation software) as well as in more complex proficiencies, such as using digital audio applications. Student perceptions of their abilities in presentation software and use of Internet browsers were highly rated, with a corresponding rise in estimated ability over the period, but both groups perceived themselves to be less proficient in database applications, web animations, programming, desktop publishing, and digital video and audio, and these perceptions of competencies in these particular ICTs decreased further over the period. In another study, Gibbs and McKinnon (2009) asked student participants to describe their level of computer skill proficiency and found stark differences in the scope of responses and considerable variation in the range of meaning attributed to the same descriptors, as participants who described their skill level as basic or intermediate used similar language to those who perceived their skills to be advanced.

One of the contradictions identified by Gibbs and McKinnon (2009) is the assertion that even as computer literacy is among the top skill sets required in today's workforce, employers are not always clear in describing the computing skills they require in new hires. Typically, employers tend to use broad terms to describe the computer skill requirements of positions in business and industry, rather than honing in on specific, identifiable ICT skills (Gibbs, et al., 2011b; Gibbs & McKinnon, 2009). Gibbs and McKinnon (2009) investigated position descriptions in job advertisements and discovered that such descriptions do not clearly depict the expectation of the employers in terms of the specific skills sets for the business graduates they are seeking to employ. In general, job advertisements use general terms such as 'must be computer literate', 'advanced computer literacy required,'[…] 'strong MS Office skills,' […] 'highly developed computer skills,' and, 'exceptional and efficient computer skills' (Gibbs et al., 2011). Moreover, in the advertisements studied, there was evidence of a wide disparity in computing requirements, for example, ICT requirements for similar positions were found to have used different terminology in terms of the

expected level of computing skills (Gibbs, 2009).

In another study, Murray, et al. (2007) investigated US manufacturing companies where specific productivity software skills were required for all levels of employees. They found that employers expected more from business graduates in terms of the ICT knowledge and experience associated with end-user computing, however, in their recruitment, these businesses were not clear in describing the actual ICT skills that were being sought. This kind of ambiguity serves neither the applicant nor the enterprise seeking a new employee. Phelps, et al. (2005) contend that many graduates and prospective employees are not confident in their computing abilities. Unless employers are reasonably clear in terms of the level and categories of ICT skills required in the workplace, business students and faculties of business are left to make predictions and best guesses about emerging computing competencies, which in a dynamic labour market, might well take them down the wrong paths.

3.3 Role of Business Schools in ICT Skill Acquisition

The extent to which the ICT skill development should rest with business schools is the subject of some debate in the literature, especially given that the digital workplace requires different skill sets from business graduates than in the past (McCoy, 2001). Business schools have been criticized on the grounds that they do not prepare students well enough for a competitive job market (Pfeffer & Fong, 2002; Sadri, 2002). For example, Feast (2003) argues that post-secondary institutions must understand their role in developing graduates' IT skills, and recognize that they cannot simply rely on the skills they bring from secondary school or hope that students will somehow develop these skills by the end of their university education.

Because the ICT landscape is continually shifting, Hulick and Valentine (2008) conclude that university entrants do not have adequate computer knowledge and skills. Rae (2005) studied findings from the Media Technologies: Access and Use Survey and found that the majority of first year university students, who completed the survey did not acquire their ICT skills in an academic or focused educational context. They were either self-taught, learned through special training courses relating to their employment, or taught by family or friends. He speculates that computer skills acquired through these means may require supplemental tutoring or coursework to augment their ICT skills for 'academic' purposes. Wallace and Clariana (2005) report that some post-secondary institutions require incoming students to demonstrate a specific level of ICT competency as a condition of admission, while some even offer introductory computer courses to help students in meeting this prerequisite. Moreover, as computer applications evolve, computing education is shifting from information-based learning to competency-based learning. Impagliazzo (2019, p. 4) argues that knowledge is no longer a primary attribute for the business labour market: "[p]rofessional technical skills as well as human dispositional attributes are becoming increasingly important." There is a new recognition of a growing need for college and university computing graduates to emerge with "meaningful level[s] of competence in the computing fields" Impagliazzo (2019) defines competency as the integration of skill, disposition and knowledge.

Lisá, et al. (2019) reiterate that in determining appropriate graduate employability skills, one must consider those proficiencies that employers think are most significant for the workplace, while Hossain, et al. (2020) found that both soft skills (communication skills) and technical skills (computer and business skills) are positively related to business graduates' employability, which is consistent with prior studies. If business education programs are to respond to the requirements of the market, the needs of corporate workplaces should exert a greater influence on their content and structure (Feast, 2003).

Current ICT applications also present opportunities for business schools to more readily infuse technology into courses and lectures and to deliver curriculum using some of these technologies. The importance of doing so has become even more evident in the recent past, as the COVID 19 pandemic has forced universities to modify modes of program delivery. A 2018 PricewaterhouseCoopers (PwC) report studied the nexus between business and higher education found that there exists a concerning gap between the perceptions of business school instructors and employers in terms of the level of student preparedness for a highly competitive job market. The report predicted a steady rise in IT-related jobs than would outpace qualified-candidates that by 2020, 77% of all employment would depend on graduates who could mobilize their education to find innovate solutions to business problems.

Social networking platforms have earned an undeniable place as a cooperative learning tool in education and mobile devices have become a widely used potential learning devices for education (Baran, 2014; Galway, Maddigan & Stordy, 2020). Benson and Fililppaios (2015) investigated more than 600 business and college graduates from the Association of MBA (AMBA) accredited UK colleges, and found that two factors – connection to work environments and age of business students –

play a significant role in utilization of social networks for professional purposes, information, and career management. The research showed that younger students particularly, tend to be versatile in the application of social networking; they more readily recognize business opportunities, while older graduates are less confident in this arena. This is an important distinction, since graduate students may already be mid-profession and the gap between them and the younger graduates could be bridged through program adjustments to continuous and advanced professional learning (Benson & Fililppaios, 2015).

4. Research Design

The research design involved two participant groups: 12 business school graduates from an Atlantic Canadian university and 6 employers (a total of 18 participants). Using a convenience sampling technique (Creswell, 2012; Merriam 2009), we began the recruitment process by requesting assistance from an Atlantic Canadian business school in circulating recruitment information to its recent graduates and identifying known regional employers. The communication materials identified the purpose of the study, and included an invitation to participate (recruitment letter) and an informed consent form. Interested graduates were invited to contact the researchers to arrange to participate in the study, or to otherwise ask any questions they may have had. From a list of employers provided by the business school, we then purposefully selected businesses known to have previously hired business graduates. HR professionals from the employer pool were contacted directly by e-mail. This process was continued until a quota of 12 graduates and six (6) employers was reached. At the time of data collection, the graduate participant's work experience ranged from 0 to 4 years. Ten (10) had earned a Bachelor's degree and the remaining two were Master's level graduates. The graduate participants were all located in the Atlantic provinces, except one participant, who moved to Ontario, after an initial period working in one of the Atlantic provinces. The employers were all, based in the Atlantic region; and were situated in the fields of technology, oil and gas, finance, software, sales, marketing and education.

Following procedures described by Bok van Kammen and Stouthamer-Loeber (1998), Mangione (1998), Marshall and Rossman (1989), and Maxwell (1998), the method of data collection involved in-depth, open-ended interviews, which give participants the ability to be expressive and provide enough data for the researcher to generate thick descriptions of these same phenomena. All, except three telephone interviews, were face-to-face, private interviews, approximately 30 minutes in length, and all were recorded and transcribed. Interviews with graduates covered a range of topics relating to the acquisition of information and communications technology (ICT) skills, self-perceptions of computer competency levels, readiness for employment and the match of graduate ICT skills with employer expectations. Similarly, for employers the interviews addressed issues relating to strengths, weaknesses and gaps in ICT skills and dispositions, desired ICT competencies, satisfaction with business degree hires, and post-employment training.

The analysis of interview data was modeled after the principles and strategies for interview data described by Creswell (1998) and Quinn Patton (1987). First, there was a general review of the printed transcripts of each of the interviews and the combined interview data was grouped according to question. The transcripts were then analyzed for a cursory identification of themes, findings and relationships among the data, during which notes are recorded in the margins. After Quinn Patton (1987), a more robust content analysis was then conducted whereby we re-examined and coded the data from the interview transcripts, purposefully thinking about the data sets, and identifying coherent and important examples, themes and patterns in the data. These ideas and relationships were further developed in the form of longer notes and memos that were sorted into categories and themes, forming the preliminary findings. As the organization of findings and themes matured, the third step of the process involved selecting samples of text from the interviews that were illustrative and confirmatory of the finding or theme. In cases where the same idea was expressed repeatedly, participant representations were summarized and paraphrased or used as exemplars of areas where we found consensus among the participants. The final data reduction step involved creating displays of information using diagrams showing interconnections among ideas and findings while identifying broader themes running through the data. Finally, the interview transcriptions were reread carefully to validate or discard these preliminary findings. Following from Silverman's (2001) discussion on avoiding anecdotalist, the data were searched for negative exemplars in the data that could be argued to falsify or refute the findings and the categories, themes and findings were revised accordingly.

The research protocol for both studies was approved in advance by a university interdisciplinary committee on ethics in human research and followed the principles outlined in the Tri-Council Policy Statement II on Ethical Conduct for Research involving Humans (TCPS2).

4.1 Limitations

The study brought some limitations in terms of length of work, number of participants, budget and the involvement of technology as research was conducted during a Master's program at a University. The original concept was to test participants in real times in terms of their computing skills but it appeared cumbersome and the study turned qualitative relying on verbal interviews through open ended questionnaires. This study was conducted as a sample study to represent in north America, the phenomenon of difference in expectations between business graduates and the employers in terms of computing skills. This investigation is primarily dependent on naturalistic and interpretive methodologies that acknowledge personal involvement of the researchers and anticipate subjectivity (Cohen, Manion & Morrison, 2011). The data are limited to the perceptions of the experiences of twelve business graduates and six employers (whose experiences are likely to be specific to a particular geographic context) and their ability to assess computing skills. As Creswell (2013, p. 206) notes, "[i]n qualitative inquiry, the intent is not to generalize to a population, but to develop an in-depth exploration of a central phenomenon." The methodology adopted for this study investigates the essence of a problem from the participants own point of view and the world they are interpreting; as such, these findings are not considered to be generalizable to other contexts and any utilization of these findings outside of the parameters of the study, should be taken with caution. Secondly, some of our interview questions involved self-assessments and while self-assessment is useful in working with attitudinal data (Karsent & Roth, 1998), its accuracy in providing information on knowledge and competence is subject to leniency bias (see Boud & Falchikov, 1989). Finally, despite our best efforts to bracket our biases and assumptions, it is possible that our own backgrounds and experiences may place limitations on our analysis.

5. Research Findings

The findings are similar to Gibbs et al (2011) who found that business graduates' self-perceptions are high, as compared to computing skills level expected by employers. But in this study employers seem quite satisfied with computing skills of business graduates and they seem bit concerned about recent graduates' other business skills. The findings are organized into three principal categories, which reflect the data gathered research questions guiding the study.

5.1 Graduates' Perceptions of their Computer Proficiency and Expectations for the Labor Market.

Majority of the participants highlighted the importance of learning technology and computing skills. It was general agreement that it is difficult to compete in professional life without adequate computing skills. As one participant noted, **"***I believe it's essential; I believe it's one of the most important skills that graduates [must] command before getting into the industry.***"** Another graduate noted, "[W]ell from my own experience, I feel that having some computer literacy is always helpful to be successful in any occupation.**"** Majority of the business graduate participants were confident in terms of their perceptions of their own computer proficiency and considered their computing skills strong. One graduate said, **"***I feel pretty confident with my computing skills", while another described their level of skill development as, "fairly well***".** Generally, business graduates represented their level of confidence in their computing skills preparation as high. The variations in confidence levels were attributed to factors such as prior work experience and personal interest in computer applications. When business graduates were asked to talk about the quality of computing skills, their perceptions about the quality of what was learned during their degree program varied considerably.

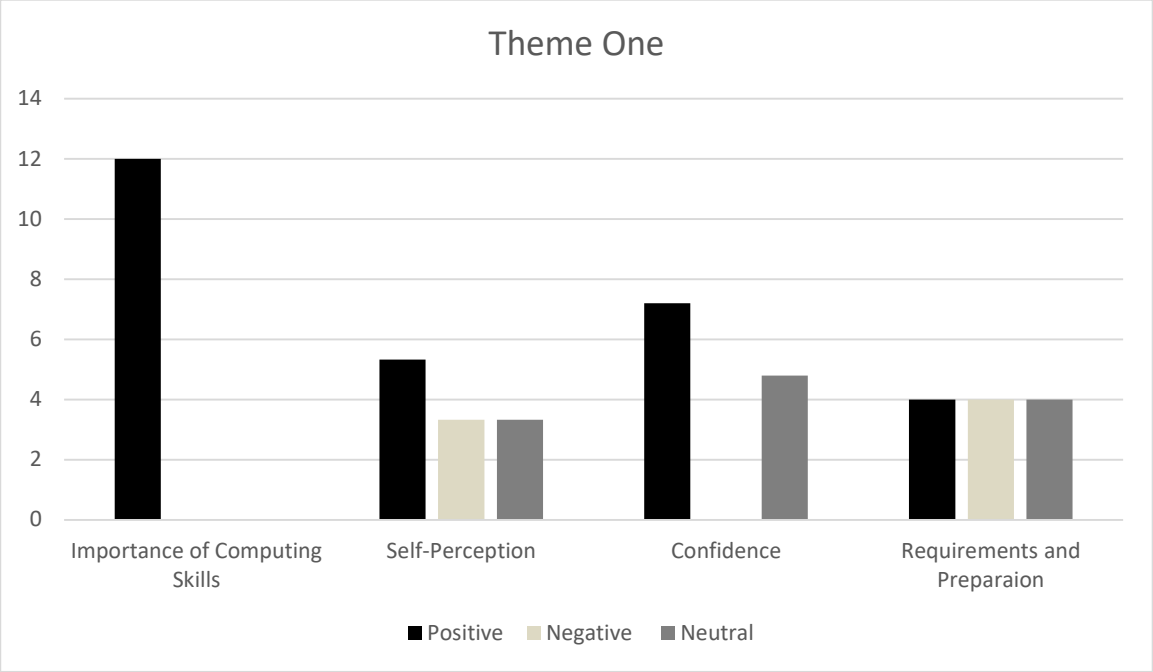

Figure 1.

5.2 Graduates' Acquisition of Computer Skills and the Role of the Business School in Technology Skill Development

It was found in the data that virtually, all of the participants relied on independent learning to acquire at least some of their technology skills. Independent learning was revealed to be a significant aspect of graduate proficiency. Many participants credited their work experiences for forcing them to advance in computing skills, since before completing work placements, they had not participated in any formal computer training. Business school is a place to learn business studies and these days business without technology is hard to think of, so the contribution of business schools is important. This was a consistent theme throughout this research. Research is the alignment between formal learning in university and the occupational requirements of the workplace. As technology develops and computer applications get very specific, and considering the fast pace at which such programs are developed and enter into the marketplace, it is difficult to imagine how four- to five-year degree programs could reasonably keep up and incorporate each new business application product into their curricula. Some graduate participants suggested that professors could do more to improve the learning of computing skills. Understanding expectations from employers is very important for business graduates and it comes with having a certain level of computing competency. Some general perceptions of graduates' participants pointed out that certain program streams require both strong computing skills and well-developed soft skills. One participant summarized their experience as follows: "I did not enter university with a lot of computing skills, and I did not actually come out with a lot either, therefore, it was something that definitely was not taught. There were not."

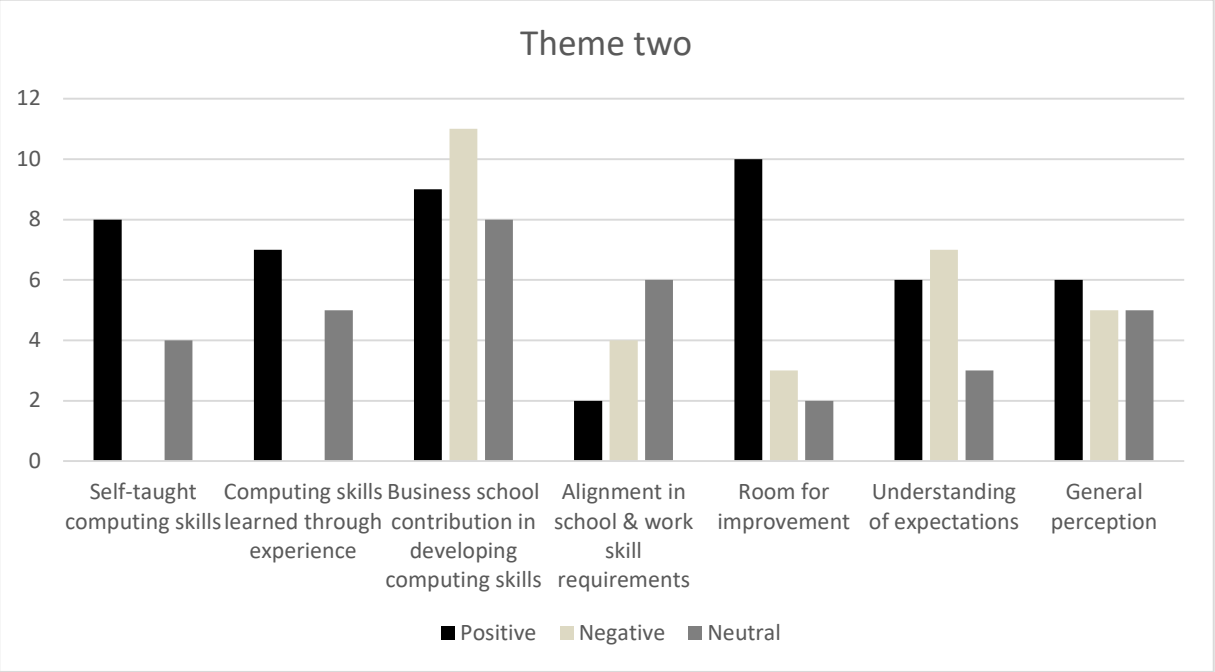

Figure 2.

5.3 Employers' Expectations and Perceptions of the Computer Proficiency of Business Graduates

According to the employers I interviewed, most of the job advertisements for which business graduates apply, ask for generic computer skill requirements. Employers revealed that unless they are seeking specialists in computer science, business writing or software development, position requirements are not very specific. As expected, there was variation in the level of hiring by different employers. Some regularly recruited from the business school and in one case an employer participant said that they had hired around fifty university business graduates in the last five years. There are certain computing skill requirements required by employers and they tend to vary from industry to industry, as mentioned by some of the employers. Generally, the kinds of industries that hire business graduates look for knowledge of basic standard business applications, like the ability to use communication applications and search engines, as well as spreadsheet, presentation and word processing software. Although there was general consensus that business graduates are well positioned in terms of technological knowledge and skills and adapted well to new environments, employers from different sectors mentioned certain skill gaps. There was general agreement among the employers interviewed that the computing skills of business graduates are satisfactory to strong, depending on the particular types of applications. Based on the employer interview data, I could find no prominent weaknesses in terms of computing skills of business graduates. The only issue I heard regarding computer readiness relates to advanced use of MS Excel, such as the creation of pivot tables and formula creation. There were concerns, however, with language, writing, and attention to detail. As noted, most employers mentioned good satisfaction with computing skills of business graduates, as they are quick in adapting and navigating organizational software and systems. Almost all employers said they provide some sort of training and orientation to newly hired employees. Another employer talked about the process of initial training once a candidate is successful in the interview process (in some instances, a multi-phase process). "There is job-shadowing for a minimum period of two weeks with an experienced employee. If a new employee is unfamiliar with the computer systems, they get peer mentoring. This might mean multiple contacts within the organization, for example, if somebody in marketing is a business graduate with strong spreadsheet competencies, the company will send the new employee to that individual or MS Excel training. Similarly, the new employee may learn another application from a different individual**".**

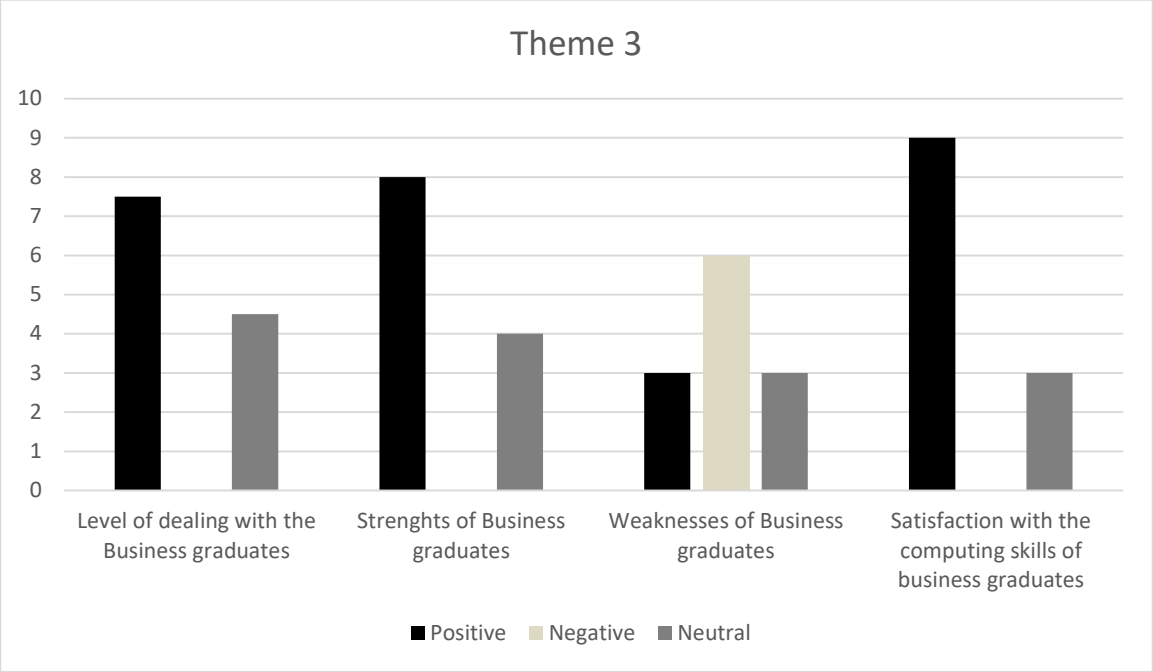

Figure 3.

6. Discussion

As technology is progressing, evolving, and ever innovating in the 21st century, there are challenges in preparing graduates to meet future technology oriented, competitive job markets. Change is happening around us all; we see change in the way we work communicate and consume. The pace of change has never been this fast and yet it will probably never be this slow again. The computing background of students entering business education programs differs significantly, as K-12 schools in different geographic regions follow different curricula. Therefore, business schools need to assess these skills at the point of entry so that knowledge and skill deficits of incoming students can be addressed, for their program of study.

Generally, the participants were positive in their appraisal of the value of computing skills in general, while recognizing the benefits of a strong background in ICTs as a means of securing a position in the job market in Newfoundland and Labrador. The importance of computing skills was emphasized by all participants, especially given the necessity to be conversant with ICTs in order to be successful in virtually all industrial sectors. When participants were asked about performing in a job requiring computing competencies, self-perception about their own computing skills was positive and their confidence levels were high. However, when it came to formal instruction in computing applications through the business school, the consensus view was that most of the ICT skills graduates had acquired were either learned informally, self-taught, learned during work terms or, in certain instances (e.g. advanced MS Excel or MS Access) learned "just-in-time," in order to complete specific course assignments. The findings show that while business graduates may not fully understand the market requirements in terms of computing skills, and even though some position descriptions may be vague, their general perception of their own preparedness for the workplace is that they are confident job seekers. One possible reason for this might be that graduates' computer proficiencies have not been independently assessed; therefore, they have inflated self-perceptions of their skill levels, which have been informed by personal impressions or other forms of unreliable evidence.

So, the graduates were positive in their appraisal of the value of computing skills in general, citing self-learning and practice along with formalized learning sessions as valuable in developing employability and career building attributes. Self-perception and confidence levels about computing skills were high, however, the acquisition of such skills was found to be primarily learned informally (e.g., through peer-instruction), self-taught, or learned during work terms. Thus, there appears to be some misalignment between workplace computer skill requirements, and program objectives. Some of the graduates who took part in this research had little or no formal computing training

and most participants had no more than a vague awareness of the scope and breadth of computing skills needed in a professional work environment.

There was no strong consensus of opinion in terms of the contribution of their degree programs to the acquisition of ICT skills; participants expressed both positive and negative perceptions of their formal university experience. A number of the business graduates who were interviewed observed some misalignment between the kinds of computer skills required in workplaces and the scope and depth of ICTs learned in their degree programs, prompting some participants to express the view that students would benefit from a stronger practical foundation in business computer applications. A small minority of participants felt that instructors in the business school were insufficiently prepared to teach complementary ICT skills. The findings also raise questions about the level of coordination between business schools and industry actors, in terms of understanding both the expectations of employers and the limitations of degree programs. Greater collaboration could help to bridge the gap between business graduates' self-perception, expectations of employers, and the capacity of business schools to be assist in standardizing and assessing fundamental computer competencies of their graduates.

The employers interviewed, said that the graduates have more strengths than weaknesses, which is a positive finding, but the weaknesses pointed out by employers cannot be ignored. Interestingly, most employers were satisfied with the level of computing skills at the time of hiring, but that is also dependent on the type of industry, and we know from the data that many graduates have to play catch up in terms of familiarizing themselves with some computer-based business systems. Generally, the employers interviewed represented their experiences with business graduates as positive; they were generally confident that university graduates would meet their expectations in terms of computing skills. They believe that, even if there was no formal training, appropriate computing skills would nevertheless be acquired through the students' need to acquire such skills to complete their coursework. That said, the data show deficits in language (grammar and spelling), writing (especially proposal and business writing) and certain more advanced or industry-specific computer applications. There may be opportunities to redress these issues at the curricular level, such as allocating learning opportunities for industry-specific applications, assessing language and writing skills, and creating interventions for students who have skill deficits in these areas, and following-up with graduates after completion of business programs to improve instructional planning in the development of ancillary forms of professional learning.

That said, some business degree streams may include more robust formal computing elements in their courses, for example, accounting majors may well develop better computing skills than marketing graduates. In addition, the data suggest that there are other factors that influence business students' computing aptitude like experience, learning attitude, level of commitment, and the extent to which graduates have taken advantage of co-curricular training or professional development. Neither do business programs attempt to simulate specific workplaces. The data show that when it comes to acquiring computer-oriented knowledge and skills, courses in the business school would likely not be a substitute for workplace training.

First, continuous follow-up with employers and constructive feedback from students are recommended to establish an information base to guide the design of computer learning initiatives, to strengthen the effectiveness of the computing skills learning in courses and to motivate students and keep them engaged well beyond the actual course session. Second, business programs should be attuned to both standard and emerging industry-specific software applications and hardware. Third, consideration could be given to hiring instructors who have worked in the industry, so that they can deliver practical knowledge to students, especially in terms of information technology. Fourth, employers in specialized fields like finance and accounting, supply chain management, and risk management should coordinate and collaborate with the business school in terms of the computer skills required in the industry. Finally, the Business School at Memorial University should consider ways and means of assessing the English language and literacy proficiency of students, early in their program, and direct students who present with written communication deficits to courses and other learning opportunities, that may help develop their abilities in this area.

In terms of their perceptions of how well the computing skill expectations are communicated to potential employees, employers were of the view that business graduates understand well the computing skills requirements for a specific job. And, even if business graduates may not already know specific computer programs, employers feel they are capable of navigating the new programs because they feel university graduates (and especially digital natives) adapt well to new technologies. In terms of job advertisements, most employers were of the view that most computing skill requirements are usually fairly generic and unless the job is in a specialized field, business graduates should have no problem understanding them. Moreover, most employers mentioned that they would provide some training and orientation to newly hired.

The study could be extended to examine the perceptions and experiences about professional computing skills learning with a larger sample of graduates and employers in different Canadian contexts. Further studies on perceptions of school administrators, and industry recruiters (employers) would also add more insight into this research topic. Research is needed that examines ways that business schools could recognize prior learning in the area of computer competencies through some form of recognizable certification or credentialing. This is a potential area for research, especially considering findings from this study that the ICT skills among graduates show considerable variation. The need for further investigation of skill deficits in English language and literacy among business graduates, especially with respect to business writing. Finally, more research is necessary to study and help establish effective preparation, training, and intervention strategies for business school students with respect to ever-evolving technological changes and new business applications.

Technology is ever evolving, so the industry's demand for different computer hardware and software applications also changes. Notwithstanding the finding that the employers in this study seem to embrace an organizational learning orientation, employers also have a significant role to play in shaping the education delivered to students, and their needs should be taken into account when designing courses and programs. This cannot be achieved unless employers are regularly and actively engaged in the instructional planning process. Such involvement has the potential to increase the relevance and effectiveness of business programs and provide better job prospects for business graduates. Employers can meaningfully contribute to the planning of formal computing skills learning in several ways: through reviewing professional course plans, proposing ICT topics to university faculty and administrators, and assisting in developing professional learning banks that list optional training available to students. These and other avenues for consultation and collaboration can help improve professional learning in business-related technologies.

7. Summary

These findings aside, employers expressed the view that they perceive a reasonably appropriate balance between the computer proficiency of business graduates and the skills they need for the workplace. Employers are satisfied with the level of computer skills they are seeing in graduates and accept that they will need to bear some responsibility for filling in the gaps. The data relating to skill deficits suggest that they are more prevalent in the areas of writing and communication – including grammar and spelling, and business writing such as preparing written proposals.

In terms of the role of the business school, these findings raise questions about a potential gap or a weakness in the current approach to university education for business students. Although there is wide recognition that the primary aim of university business degree programs falls outside of technical training, there is clearly room for a more standardized approach to the teaching and assessment of computer skills. Moreover, there is a demonstrated deficit in certain language and literacy skills among some students. The findings suggest the need for better coordination between business schools and industry employers to better align the needs and expectations of employers with the goals and objectives of business programs. Greater collaboration could help to bridge the gap between business graduates' competencies, employer expectations and the ability of business schools to standardize and assess computer skills and language proficiencies of their graduates.

Research has demonstrated that how the youth at business schools engage in learning computing skills affects their chances of getting a professional job. The present study explores business school graduates' and employers' views about their experiences with computing skills. The findings of this study quite similar to Gibbs et al (2011) who found that business graduates' self-perceptions are high, as compared to computing skills level expected by employers. The findings also show high levels of confidence among graduates regarding their computer proficiency levels. While employers were generally satisfied with the ICT readiness of graduates, they identified deficiencies in certain soft skills as well as issues with communications, including language, grammar, and business writing.

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