Determining Success Factors, Essential Skills and Employability of Young Adults Entering

the IT Workforce

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Abstract

Traditional higher education institutions are often tasked with the challenge in preparing young minds to develop necessary skills to successful outcomes and transition into the workplace. However, the skills that students perceive they need, employers want, and academic institutions teach for are varied and unaligned with one another. The purpose of this study is to determine what skills are needed, how they connect with one another and to determine whether other educational platforms offer measurable levels of employability that differ from outside traditional brick and mortar institutions. Research conducted through semi-structured interviews with students who have experienced entry-level roles within the IT industry and employers that have experience in IT fields that have worked with youth from both non-traditional and traditional educational formats are explained throughout the study. Information collected from semi-structured interviews were further analyzed through a focus group consisting of staff that have direct experience with preparing youth for IT-related roles. Results from the semi-structured interviews from both students and employer identified 9 skills including, adaptability, asking for help, communication, initiative, receiving feedback, teamwork/collaboration, time management and a willingness to learn. Staff within the focus group further explored how these specific skills contribute to the success of the students they teach in relation to their own perceptions of higher education and other non-traditional education formats. This study was able to determine that though technical skills will vary based on the demands of the industry, there is a need to eradicate implicit biases that plague alternative forms of education in order to develop new expectations and focus on competencies that adequately addresses the needs of the current economy but also prepares individuals for future of work as an entry point into the Fourth Industrial Revolution.

Table of Contents

CHAPTER 1 INTRODUCTION

1.1 Rationale for Research

As a veteran IT professional turned teacher, having worked in various IT related industries and educational settings ranging from K-12 and higher education, my personal experiences with youth have identified varied understandings of what critical success factors and indicators of success look like within academic settings. The well-known business mantra which is often referred to by many software engineers as the, "fail fast, fail often" supposition does not tend to translate into academic settings, and has very different connotations and implications to students within the classroom and within higher education institutions than it does in the workplace.

My current professional context is as the Senior Education Manager at a Canadian non-profit charitable organization, providing opportunities to underserved youth (ages 18-29) who are often referred to our program because many of these young individuals do not have access to or have not completed higher education due to a range of socio-economic barriers. The aim of the program is to provide technical training after which individuals are placed into meaningful and sustained entry-level roles within the IT industry, essentially launching their digital careers within today's technologically abundant landscape, all at no cost to the participant.

Many of the youth that are accepted into the program have indicated a range of social barriers preventing them from attending university or college including but not limited to high tuition costs and various family obligations that have taken them away from school. This includes those individuals who have had the privilege of completing a higher education degree or diploma within either a Canadian or an international context but have

not been able to find work in their related field in which they studied. As a result, most of the participants, regardless of higher education credentials, have had to work within survival jobs such as retail and customer service roles to ensure they are keeping up with the rising costs and standards of living.

A large part of my role outside of providing direct technical instruction to youth is to develop the IT-focused curriculum, conduct skills analysis of trends and needs within the IT sector, consult with external institutions and organizations that are seeking talent to fill positions within their companies, and integrate all aspects of these into what can be considered a holistic non-traditional and alternative approach to higher education practice, different from what most other institutions offer. The program provides participants with the necessary soft skills such as networking, resume writing, interview preparation to navigate within the workplace, while balancing these soft skills with personal development skills that encourages mindfulness, coping with stress, conflict resolution, time and organizational management, and of course, technical training towards earning globally recognized certifications as a starting point within the IT industry.

Upon entry into the program, participants are reminded of expectations such that they should consider their time in the program as a workplace simulation and the experience should be treated as such, as the end goal is to ensure all individuals enrolled in the program are employment ready and are adequately prepared to initiate their career within IT. Thus, the rationale for this research is to determine whether unique approaches and the integration of new educational models such as the one explained above, and other programs outside of traditional brick and mortar higher education practices, can lead to and promote the success of an individual.

1.2 Problem Statement

The specific problem that this research study is attempting to address, and challenge, is whether formal traditional higher education institutions are sufficiently providing opportunities for youth to develop the necessary skills and achieve the general success outcomes to enter the IT workforce. Many countries have placed emphasis and the responsibility upon higher education institutions to support and influence how current and recent graduates will directly contribute to the growth and generation of the global economy (Harvey, 2000). Meanwhile, the continued increase in the availability of Massive Open Online Courses (MOOCs) and open educational resources (OER) have paved ways for anyone wanting to develop skills necessary for the future of work without paying high tuition fees or physically attending higher education institutions.

There has even been integration of available resources with flexible blended learning models that incorporate face-to-face interaction with online experiences that help reduce costs for learners and decentralize the process of obtaining higher education credentials (Becker et al., 2018). These informal online and blended learning programs have both supported and disrupted the attainment of IT-specific skills from a linear approach once provided in traditional modes of education to a continuous and dynamic process where knowledge can now be acquired from multiple sources in self-paced environments.

Although there has been an increased accessibility to education specific to IT skills, it is also important to note that according to the International Labour Organization (2014), the approximate global youth unemployment rate across all regions of the world is at 13.1% which accounts for 74.5 million people between the ages of 15-24 that do not have jobs, and this is estimated to increase. Additionally, many countries have indicated that the proportion of youth aged 15-29 who are not employed, nor in education or training (NEET),

also continues to rise (International Labour Organization, 2014). In order to counteract this global trend, just as there has been an increase of online and blended learning programs, there has also been an increased appearance of alternative vocational and rapid skills training programs specifically to provide youth with opportunities to enter the workforce and especially within the technology sector.

The proponents of such programs have argued that the amount of time and money that youth spend in a 3-4-year university or college programs can be spent upskilling and obtaining employment in a much more efficient manner, spending less time and spending less on tuition payments (Becker et al., 2018). However, we are still unable to ascertain whether these new paradigm shifts in education have been able to keep up with the employability agenda as governed by various countries, thereby facing similar economic and political pressures from government bodies that traditional higher education institutions have faced over the years.

Though vast amounts of data have been collected on the effectiveness of non-traditional and informal learning environments over the past decade, there is still more information needed to determine whether the success of students who attend these alternative higher education programs are closely correlated with better employment outcomes (Becker et al., 2018). It is even more important that higher education institutions themselves keep up with the changing landscape of learning such that youth can confirm that they feel adequately prepared to transfer knowledge from their learning experiences and apply them into the workplace in order to establish a successful career.

It is also the responsibility of various industries to begin to recognize alternative methods of education such as these rapid training programs as an equally viable source for talent as traditional schooling systems. Thus, working industries, academic institutions and

government organizations need to begin close the gaps in varied understandings of success and align themselves beyond curricular objectives such that new generations that live within a global knowledge economy should focus on that lead to positive outcomes both in academic and workplace settings.

1.3 Purpose and Aim of Research

Over the past decade, accessibility of knowledge has increased exponentially through technologies that have not only been disrupting the educational arena but have also challenged the rising costs of higher education institutions. Many students now have alternative means of upskilling and defining success for themselves through unconventional programs and various online platforms. According to my personal experience and view, learning has become flexible and adaptable to specific goals that individuals set out for themselves in diverse environments.

As discussed earlier, traditional modes of education do not necessarily lead or support individuals towards obtaining employment and experiencing career success. Yorke and Longden (2004) reason that success from an employment perspective is not only about obtaining a degree but also about having the skills necessary to solve problems in the real world, skills which higher education institutions do not necessarily teach. Due to conflicting views and perceptions of academic and career success, many students are left confused and as a result are unemployed or forced to work in roles and jobs that pay low wages and require lower skills to sustain.

Thus, the purpose of this research study is to determine connections through use of data to determine contemporary perspectives and shifts of learning theory for the 21st century. More specifically, this research will aim to determine the motivations of student

success and how this is interpreted by different stakeholders such as students, employers, and staff enrolled in or working with non-traditional education systems. And as a result, my research will specifically focus on understanding the characteristics of student success as individuals enter the IT workforce as well as identifying which academic, professional soft skills, and personal development and life skills link to measurable levels of employability from varying perspectives including those contributed by employers, educators, and students themselves.

1.4 Research Questions

The following research questions have been formulated based on the problem and purpose of the research provided above. The overarching general question that this research will attempt to answer is:

- What does student success look like, and how is it measured, from the perspectives of different stakeholders' employers, students and teachers?

Some additional more specific questions that consider both the academic and career readiness of youth within this study include:

- What does success look like to students entering and working in the IT industry?

- How do skills that determine academic success link to measurable levels of employability for these students?

1.5 Motivation for the Research

A major driver for this research is to identify gaps that many young adults are faced with when transitioning from education into employment. Gaps such as previous work

experience or even possessing credentials and related education to fulfil job requirements become even wider for those individuals that are unable to attend traditional forms of education, and as a result, are working in low paying jobs. Additionally, many of these jobs that youth are employed within such as retail, general banking and food services are at risk of becoming redundant as technology practices such as automation are being adopted and thereby replacing the need for many white-collar roles (World Economic Forum, 2018). However, at the same time as many companies begin to implement automation practices that disrupt certain industries there are also arguments made that there will be an increase in demand for jobs and roles within industries such as IT that require higher level skills (World Economic Forum, 2018). Thus, it is important that there is an even greater urgency in determining the value that many of these displaced workers can provide through incentivizing redeployment initiatives (World Economic Forum, 2018) and indicating what transferable competencies these individuals possess that were gained from working in the very industries that are at risk of being disrupted.

To develop an understanding of the shift in the labour market landscape there is a need to begin looking at non-traditional education reforms and structures that work towards understanding the needs of the displaced workers and produce methods and frameworks for helping individuals upskill, reskill, and gain new skills that will allow for a direct pipeline of talent into higher paying and higher skilled jobs within IT. Furthermore, in the process of identifying skills needed to compete and thrive within these vacant and evolving IT related roles, there is a need to eliminate, or at the very least certainly reduce, both implicit biases surrounding non-traditional education programs as well as preconceived notions around underrepresented young adults that do not necessarily have access to the same societal advantages as other groups do. Industry experts, recruitment specialists and

human resources personnel need to be informed and educated toward a deeper understanding that if they continue to uphold their current practices they are missing out on a diverse talent pool that will provide them with direct matches to produce positive outcomes within the IT workforce.

Thus, one of the major motivations for this research is to list and identify the common skills and competencies already possessed by young adults that have attended alternative education and/or workforce development programs. The hope is that the data collected from semi-structured interviews with non-traditional youth working within the entry-level roles in IT, experts working with these youth in the IT sector, and staff members providing the training to support these young individuals in being prepared to work within the IT workplace will support the development of a new codified model. This model can not only be utilized as a framework for supporting the hiring practices of non-traditional young talent but can also be referred to as a guide to inform best practices when developing a curriculum to support non-traditional education and workforce development training programs for displaced workers across varying industries.

1.6 Thesis Structure

Chapter 2 provides insight into what different literature and previous research states about varying definitions of success from the academic perspective of educators, institutions, and students themselves. Various success models outlining employability skills that have been implemented in different environments are explored within the chapter to determine whether any existing models have been effective in determining a common understanding of success relating to an individual's transition from school into work. This chapter also determines if there have been advances in assessment to measure both

academic and workplace skills and competences, and whether recent technological

advances in big data and analytics have supported and have influenced how measures of

success are determined in academic and workplace settings. The chapter concludes with

suggestions for emerging learning theories that could potentially align success factors both

in work and within education institutions while embracing the impact and implications of

technological change in today's global knowledge economy.

Chapter 3 further describes theoretical foundations introduced in Chapter 2,

specifically expanding on how aspects of constructivism and connectivism have implied the

need for a new learning paradigm that adequately addresses the success factors throughout

the learning journey of a student from within academic settings into the workplace.

Additionally, the chapter explains how the adoption of a new learning paradigm could

contest and challenge traditional models of education and includes suggestions for

implementations for the benefit or youth navigating the digital age. The chapter then

concludes with reasons behind reframing the research questions based on the theoretical

foundations explored throughout the chapter.

Chapter 4 outlines the research design, specifically the ontological and

epistemological underpinnings that led to the application of a qualitative methodology that

utilizes an interpretative phenomenological analysis (IPA). This chapter also provides insight

into the sampling of the participants involved in the study, the study design and ethical

considerations and precautions taken while conducting the research. The chapter concludes

with an explanation of the methods used and rationale behind selecting semi-structured

interviews and focus group to collect data.

Chapter 5 extends on findings from the previous chapter in detailing and exploring

how employability is perceived from multiple views of participants involved through a

discussion. Perspectives and common themes from students, employers, and staff are further discussed in attempts to answer the research questions.

Finally, Chapter 6 is specifically focused on identifying any new findings which attempt to connect information from all the previous chapters to determine limitations of the study, provide a view on my professional and personal context in relation to findings throughout the study, and future suggestions for research such as blockchain technologies and Artificial Intelligence (AI) and their impact on the future of work and education. Finally, the chapter, and consequently the thesis will conclude with a brief summary of research conducted along with any final considerations of the overall study.

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of literature offering varying definitions of success from the perspectives of academics and professionals. Academic success from a personal and professional perspective as an educator is largely based on the evaluation of student performance through culminating activities, examinations, and a collection of assessments. However, a student who attends a higher education institution may regard success as learning specific skill sets that are transferable into the workplace or achieving high grades within a program. The challenge that many young adults face is that many industry leaders hold their own metrics for success that assess levels of employability of an individual that are different from what is being taught in school (Jayasingam & Thurasamy, 2018). Furthermore, the skills that students have acquired through their educational experiences do not always translate into successful perceived outcomes for obtaining a job (Gu, Zhao, & Wu, 2018).

Thus, the purpose of this chapter is to determine whether there are common characteristics of success in both academic and professional environments that provide insight in preparation for work in the IT industry. Furthermore, this chapter will analyze various concepts that have been developed to assess and measure success factors through the examination of various proposed models that are utilized to identify academic and employability outcomes. Additionally, potential implications will be discussed specifically relating to trends and technologies that attempt to define success from educational experiences into meaningful employment. The chapter will then conclude with a brief exploration for the need for a new learning paradigm in a digital age that can be utilized to identify gaps in literature.

2.2 Defining Student Success

Schwartzman (2013) argues that regrettably education has fallen victim to a global market mentality whereby knowledge acquired by students is equivalent to purchasing a product in hopes to appease a specific need. In this case, the knowledge should provide enough "buying power" to obtain a job and academic credentials that increase in market value. This implies that consumerist principles have been applied to higher education which has been referred to as the 'commodification of education'. It is argued by some academic leaders that the commodification of education does not benefit nor encourage student success but degrades intellectual rigor (Schwartzman, 2013). Additionally, it is also reasoned that the quality of teaching and learning is at risk of corruption as a direct result of the commodifying of education (Naidoo & Jamieson, 2005).

On the other hand, there are many other scholars who believe that a partnership between industry and academic institutions is necessary to provide students with localized learning opportunities that focus on essential skills required to compete in a global knowledge-based economy (James, Guile, & Unwin, 2013). A probable reason why there are opposing perspectives on the commodification of education, and specifically how to prepare students in a global knowledge-based society, is that there are varying definitions of student success and what it should look like.

To narrow down a concise perspective on what success looks like in a global knowledge-based economy, the two overarching categories that will be explored and compared are academic success and career success. To determine any similarities between these two areas, it is also necessary to identify what are the major skills needed to successful outcomes in both education and workplace settings.

2.2.1 Defining academic success.

In his book The Global Achievement Gap: Why Even Our Best Schools Don't Teach the New Survival Skills Our Children Need—and What We Can Do About It, Wagner (2010) has identified, through hundreds of interviews with leaders in the technology industry as well as educators from varying schools, the seven most sought-after skills that students should have acquired throughout their academic careers and which employers feel are necessary to succeed in the workplace. These seven skills and their accompanying descriptions as developed by Wagner's (2010) study are listed in Table 2.2.1-1 below:

Table 2.2.1-1 Wagner's 7 Survival Skills

Skill	Description
Critical thinking and problem solving	The ability to break down abstract issues into granular and concise categories to identify patterns and cultivate solutions.
Collaboration across networks and leading by influence	Understanding that solutions are developed through varying networks of people and not through individuals, whereby ideas guide direct systemic change.
Agility and adaptability	A concrete understanding that complacency is no longer a reality but rather constant change and the pace at which operations within organizations fluctuate on a daily basis are expected and can be handled professionally.
Initiative and entrepreneurship	The consistent search for the improvement of strategies through creative expression on individual basis with minimal external influence.
Effective oral and written communication	The ability to clearly and concisely convey ideas through varying mediums including but not limited to email correspondence, reports, and presentations.
Accessing and analysing information	The ability to sift through, organize, categorize, and develop meaningful connections with the vast amount of information to inform improvement of best practices within an organization.
Curiosity and imagination	The ability to ask questions that will encourage discussion and spark interest while driving a method of developing their own work space without depending on employers to provide guidance.

Aside from the list of skills listed above, a key consideration for both academic and career success is students' self-efficacy which refers to whether an individual believes he or

she can be successful in completing academic tasks as well as demonstrating potential within a specific career post-graduation (Harder, Czyzewski, & Sherwood, 2015). Bandura (1977) attributes self-efficacy to four conditions:

- Performance accomplishments – through repeated practice and continued success, there will be an increase in self-efficacy and eventually a mastery in performance while completing a specific task or job;

- Vicarious experiences - through the observation of successes of people who are surrounding you, there is a greater chance that an individual's self-efficacy will increase due to the belief that they can accomplish the task as others have done;

- Verbal persuasion – through consistent verbal assurance from an external source in the form of coaching there is the chance for obtaining increased self-efficacy resulting in the job and task that you are completing to be mastered;

- Emotional arousal - through the development of stress coping strategies to deal with taxing situations that have a negative effect on personal competency when trying to master a task or job, there can be an increase in self-efficacy and therefore increased chance for mastery.

Each of these conditions is inter-related with others to support increased self-efficacy and employability of individuals (Hazenberg, Seddon, & Denny, 2015). Employability in this context, as explained by Hazenberg, Seddon, and Denny (2015) is the heterogenous application of subject-specific skills learned in school and the personal characteristics individuals demonstrate on the job categorized within Bandura's list above. Thus, it can be argued that only relying on just one set of employability traits such as subject-specific ones can equate to being employable does not equate to being employed (Brown & Hesketh, 2004). Conversely, as Bandura (1977) indicates, those individuals that are considered to

demonstrate strong self-efficacy during their school career but do not perform well academically may also not perform well on the job.

Thus, it can be presumed that though defining success is highly subjective, one possible definition in an academic context is one's ability to demonstrate high self-efficacy while developing key competencies and skills that continue to support an individual's future career progression and personal growth.

2.2.2 Defining career success.

For the reason stated above, it is important that when determining factors that adequately measure career success there are both intrinsic and extrinsic motivations to consider. Kappelman, Jones, Johnson, McLean, and Boonme (2016) define career success as the motivation of IT professionals to move into increased levels of responsibility by showcasing performance based on skills in current roles. Judge, Cable, Boudreau and Bretz (1995) categorize such motivations into objective career success and subjective career success: individuals may measure their relative career success based on opinions of others or may also consider their own personal biases and appraisals of professional success in the workplace. Some key indicators of objective career success are generally regarded as the amount of pay one receives, positions held within the organization, types of experience, and educational qualifications while subjective career success indicators focus mainly on personal job satisfaction and career satisfaction (Judge, Cable, Boudreau, & Bretz, 1995).

A limitation to this study is that data were limited to individuals in executive positions who had opportunities to experience higher education and had already established a career path for many years and had exposure within varying industries. To determine perceptions of career success for youth and individuals entering the workplace, a separate set of indicators to measure both objective and subjective career success would

need to be formulated. Many individuals that are relatively new to or entering the IT

workplace for the first time, due to their lack of experience would judge their career success

as the ability to apply practical technical skills (such as coding, building and troubleshooting

computers, and working with databases), learned prior to entering the workforce

(Kappelman, Jones, Johnson, McLean, & Boonme, 2016). Kappelman et al. (2016) further

explain that the challenge in assessing IT-specific skills and their relation to success in the

workplace is that there are many skills that are dependent on the individual's role or tasks

assigned to be performed on the job. Such skills are relative to the organization the

individual is working in, and they are also continually changing over time. Technical skills

also become less important to an individual's career success as their paths lead them to

more senior positions, while non-technical skills and soft skills such as communication skills,

people management, and decision-making become more critical within leadership roles

(Kappelman et al. 2016).

2.3 Assessment and Measurements of Success

As can be deduced from the previous section, there are several factors to consider

from the perspective of an educational researcher when developing an assessment strategy

that adequately aligns with the objective, subjective, personal and professional definitions

of success. It is important to recognize that not only do the practical components such as

the technical and soft skills determine success of an individual with respect to their

readiness to work, but also the cognitive and social-emotional attributes that individuals

exhibit contribute to their success in the workplace (World Economic Forum, 2018). Thus, it

becomes increasingly challenging to measure all variables that support success in multiple

areas, and these should first be looked at as distinct identifiable pieces of a larger puzzle

prior to proposing any models that would adequately combine various features for a more robust holistic framework.

One theoretical framework that both aligns with the conception of innovation and considers the role of self-efficacy in students' academic success is the Adaption-Innovation (AI) Theory (Harder, Czyzewski, & Sherwood, 2015). The AI theory was originally developed as a model for arranging and categorizing the cognitive styles of individuals on a spectrum that ranged from adaptors on one end to innovators on the other end (Goldsmith & Kerr, 1991; Stum, 2009). It should be noted that neither side is seen as superior to the other but the related inventory aids in identifying the type of cognitive style an individual is more likely to apply in creative thinking and problem-solving situations (Harder, Czyzewski, & Sherwood, 2015). Individuals who attempt the questionnaire are provided with a Kirton Adaption-Innovation Inventory (KAI) score that is indicative of where they are on the continuum (Kirton, 1989; Harder, Czyzewski, & Sherwood, 2015). Some of the differentiating characteristics between the two types are that adaptors are more controlled in their approaches to problem solving while innovators are prone to working outside a set structure to solve problems (Harder, Czyzewski, & Sherwood, 2015).

Some researchers have tried to use the AI model as a guideline for individuals within an academic setting to determine the types of jobs and careers students could be matched with depending on their preferred cognitive style (Harder, Czyzewski, & Sherwood, 2015). However, the AI model has been largely used successfully as a method to examine organizational behaviour among leaders within an organization (Goldsmith & Kerr, 1991) and to determine how leaders within a workplace solve problems (Stum, 2009). Furthermore, the AI model is widely used as a framework to support organizational practices that relate to leadership and team building to inform best practices within the

workplaces when working within a group of people that demonstrate varying cognitive preferences in relation to problem-solving (Mudd, 1995).

Unfortunately, as can already be inferred, Wagner's and Kirton's models place emphasis on a variety of different factors that attribute to academic measures of success. There is also little evidence to suggest that research has been done in aggregating both academic and career success criteria which would effectively inform educators and employers of the readiness levels of students transitioning from higher education into the workplace (Wagner, 2010). However, other representations of college and career readiness models, such as Conley's college readiness framework, suggest that those individuals that are equipped with specific skill sets for academic success are also qualified to work and succeed in entry-level training programs leading to career driven opportunities (Bragg & Taylor, 2014).

Conley (2015) has identified four dimensions of readiness and academic success:

1) Key cognitive strategies: refers to the way students think about their coursework and apply problem solving to make sense of conflicting perspectives through communication;

2) Key content knowledge: refers to how students understand and perceive knowledge and measures engagement with core content;

3) Key learning skills and techniques: refers to students' self-awareness and self-efficacy in relation to collaborative team work, time management, and critical reading;

4) Key transition knowledge and skills: refers to students' ability to navigate transition into college (pg. 12).

Though the above model is comprehensive in its approach, each measurement is composed of multifaceted elements which further obscures a specific guiding idea of how to measure accurately the potential for academic success of students. Furthermore, even though this model could be adapted for use within the context of the workplace, many of the above descriptions have been accrued through studies that have been conducted through a single perspective of succeeding in academia, and as such there has been minimal input from employers in institutions outside of higher education.

From a global context, many higher education institutions claim that they have been embracing and incorporating essential employability skills for many decades (Yorke & Knight, 2004). However, government initiatives and recent interests in the employability agenda from a global standpoint have coincided with businesses stating that higher education institutions are not adequately preparing young minds for the workplace (Arora, 2015). It is this lack of understanding between all shareholders involved - government organizations, corporate sectors and academic institutions - that has caused confusion regarding the shared meaning behind employability (Holmes, 2000).

Between 2009 and 2014 that there was an increase of 71 percent of jobs presented by private companies across the Canadian labour market and employers are eager to fill roles of highly skilled professionals who demonstrate adequate technical skills and soft skills but also do not feel that recent graduates are equipped with the skills required (Desire2Learn, 2018). Thus, it is unclear whether success in school directly translates into the soft skills that are applicable in the workplace to which many organizations have previously alluded to, and whether varying countries agree with which soft skills are needed to be successful and correlate to the needs of IT industry as will be further explored in the next section.

2.3.1 Identifying indicators for measuring success in the workplace.

What makes filling the skills gap, specifically in the IT industry, so difficult is that the landscape within the technology industry often changes as a direct result of the variability of needs of organizations to keep up with future technological trends to sustain business practices at a rapid pace (Brockway & Hurley, 1998). Furthermore, external pressures from market forces and globalization trends in combination with advances in technology have caused organizations to offer less sustained employment opportunities (Joseph, Fong Boh, Ang & Slaughter, 2012). However, success within IT is possible when individuals in the workplace can learn and build systems at a rapid pace that shows commitment to the growth of the business while also incorporating service to customers providing increased quality, expertise and overall user satisfaction (Brockway & Hurley, 1998).

Additionally, researchers have stated that IT-related services are no longer considered as independent applications that support any one specific team or department but rather IT personnel are expected to continue to enhance their IT skillsets to expand their knowledge and understanding of business needs to help the organization progressively move forward in several key areas (Kappelman, Jones, Johnson, McLean, & Boonme, 2016).

Therefore, the multivariate characteristics that compose the makeup of an organizational structure have inadvertently made it more difficult to pinpoint where an individual would apply any specific IT-related skills to a specific job or task. Van Der Heijde and Van Der Heijden (2006) state that careers that require application of IT skillsets have become nebulous and "boundaryless" (p. 449) such that they require people to apply their expertise and skillsets within cross-functional and multi-disciplinary departments and teams. Traditional workplace models, largely influenced by the workplace habits of the industrial revolution of the 19th and 20th centuries, are no longer a valid baseline for determining

27

workplace success. Similarly, many education frameworks have conformed to industrial practice that comply to specific tasks and jobs (Myers & Adams-Budde, 2016). Thus, updated success measures are required that reflect perceived success of participants within their institutions as well as correlating to transferable skillsets learned in academic settings.

Though Joseph, Fong Boh, Ang and Slaughter (2012) concur with the necessity of transferability of skillsets within boundaryless IT career paths, they also further argue that individuals who progress within IT careers no longer do so in a sequential pattern as once was depicted in traditional career models. Therefore, individuals tend to define objective career success through upward physical mobility within an organization that directly correlates to an increase in salary (Joseph, Fong Boh, Ang, & Slaughter, 2012). As a result, another indicator of success that could be considered when assessing employability within a workplace is the pay increase in relation to positions that require higher skill or increased knowledge in a focus area within IT.

2.3.2 Measurements of employability.

In the previous section, it has been determined that individuals and organizations perceive their own potential measures of success based on both subjective (emotional agility) and objective (physical mobility) characteristics such that hard skills such as the application of technical skills are fluid across various career paths (Joseph, Fong Boh, Ang & Slaughter, 2012). Additionally, there is a clear indication that upward mobility within an organization or lateral movements within or outside the IT workplace across different organizations (Joseph, Fong Boh, Ang, & Slaughter, 2012) becomes progressively easier if specific technical knowledge is applied to roles resulting in an increase in wage and salary expectations. This section will focus on identifying soft skills that are considered integral to

increased employability and workplace performance within the IT industry (Verma & Bedi, 2008).

As determined earlier, it has been acknowledged that at various stages of an individual's IT career, there is a decreasing emphasis on technical skills and knowledge, while simultaneously there is also an increased importance and application of soft skills within the workplace to maintain growth and success. According to Verma and Bedi (2008), soft skills "pertain to the skills required by any individual related to the various aspects of his personality like communication skills, time management, self-esteem, team work, leadership, cross cultural sensitivity, and the like" (p. 15). In one study, researchers interviewed varying individuals at various levels of their IT career including Chief Information Officers (CIOs), IT Middle Management, and New IT Hires: interviewees were reported to value several types of soft skills to perform successfully in their roles (Kappelman, Jones, Johnson, McLean, & Boonme, 2016).

However, the authors also found that there was an overlap of skills in individual accounts as well as perceptions of aspects of each other's roles that most people found valuable regardless of the type of position they were currently in. These skills included collaboration with others, problem solving and oral communication. Interestingly, both IT Middle Managers and New IT Hires agreed that technical knowledge was significant followed closely by problem-solving, whereas CIOs did not place any importance at all on the technical knowledge needed for these individuals to be successful in their jobs (Kappelman, Jones, Johnson, McLean, & Boonme, 2016).

In another study, researchers classified what employability skills recent graduates should be focusing on and improving specifically in areas related to communication, collaboration with others, and problem-solving within the workplace (Abas & Imam, 2016).

The authors also add that adaptability and ongoing learning are also competencies that are valued assets that integrate well across all employability contexts (Abas & Imam, 2016). In other words, by continuously and rapidly learning on the job, other competencies and employability skills such as those mentioned above will improve individual performance and as a result produce a positive impact within the workplace.

2.4 Proposed Models of Academic and Career Success for Positive Employability Outcomes

Considering the varying definitions of success in academic and workplace settings, there is no surprise that the term employability also has multiple meanings and implications dependent on the context and environment within which the term is applied. As a result, Yorke and Knight (2004) have devised a framework known as the USEM model, which is an acronym for understanding, skills, efficacy, and metacognition which attempts to identify alternative methods of defining employability and to categorize specific employability skills that can be integrated into the higher education curriculum. The USEM model proposes that there are four essential interconnected domains that link skills sought by employers and those learned within an individual's academic experience:

- Understanding, of concepts and content;

- Skills, practical application of content in specific contexts;

- Efficacy beliefs, in self and personal attributes to make sustainable changes;

- Metacognition, ability to regulate and reflect on one's learning (Yorke & Knight, 2004).

Though the USEM model is indicative of a research-based approach to understanding the complexities of employability in an academic setting, there has been little evidence that this

model is responsive to student needs such that they understand what areas they should focus on to succeed in a workplace as they transition from higher education contexts (Dacre Pool & Sewell, 2007). Furthermore, such a model is only effective if individuals are fortunate enough to experience higher education practices that are invested in personal and professional growth beyond course specific and content driven subject matter.

A proposed model that precedes the apparent weakness of the USEM is the DOTS career model originally developed by Law and Watts (2003). DOTS is an acronym for, decision learning, opportunity awareness, transition learning, and self-awareness which is also categorized into four distinct areas for consideration regarding employability. These four areas are:

- Decision learning, helping students understand the various methods and strategies involved in making decisions in both deliberate and inadvertent circumstances;

- Opportunity awareness, providing students with the knowledge of the working environment they are about to enter and potential opportunities that may lie within it;

- Transition learning, helping students recognize and cope with differences in academic and work settings;

- Self-awareness, aiding students in identifying strengths and weaknesses that define the unique characteristics of an individual.

The simplicity behind the DOTS career model, as it was developed primarily to assist careers education counsellors and incidentally at school level rather than higher education in their work (McCash, 2006), still presents as being inclusive of student needs and engagement, but like the USEM model has also been open to criticism. McCash (2006) proposes that individuals transitioning from higher education into workplace settings have preconceived

notions of career expectations and individual experiences that the DOTS model does not adequately address. For example, many career educators that implement the DOTS education model tend to match students with their occupational interests and search for career opportunities that align with an individual's personal identity, and this often results in a skewed definition of subjective success for the student (McCash, 2006). Thus, McCash (2006) states that it is important that students should be exposed to various career options through focused changes in curriculum that include career exploration and vocational training, but students should also learn to use tools to become advocates for their own career progression through academic experiences instead of waiting for these changes to happen on their own. Thus, if the DOTS model is purposefully used as guidance towards a focused career path such as placement within the IT industry, it is possible that such idealistic viewpoints on success could be directed into a more manageable objective framework within the curriculum for educators to address.

The third model for employability which includes both the carefully considered criteria of the USEM model and the simplistic aspects of the DOTS career model, which both employers and higher education institutions could utilize, is known as the CareerEDGE model (Dacre Pool & Sewell, 2007). This model is made up of five aspects known collectively as the key to employability:

- Career Development Learning: Understanding the market and global economy to determine which careers and jobs are suited to personalities and interests;
- Experience – Work and Life: Individuals that have previous work experience and have balanced their study time with personal lives have a greater employability and readiness factor than those individuals that have not subjected themselves to these experiences;

- Degree, Subject Knowledge, Understanding and Skills: Obtaining a degree or certification showing that students can articulate the knowledge they have gained throughout their academic career is of importance to employers but on its own does not hold sufficient merit;

- Generic Skills: Attributes from numeracy to adaptability to time management are all essential skills: this model has categorized core, key, and transferable skills under an umbrella of generic skills as varying employers' value specific skills over others depending on the job and career students set out to pursue;

- Emotional Intelligence: Personal qualities and attributes related to self-regulation, processing skills, and self-awareness are directly correlated to academic success as well as success in the workplace (Dacre Pool & Sewell, 2007).

Of the three models, the CareerEDGE model's classification of emotional intelligence, rather than the under-articulated term 'efficacy' in the USEM model and an oversimplified version of 'self-awareness' as seen in the DOTS model, is much more nuanced. According to numerous studies, individuals who demonstrate high emotional intelligence also show self-efficacy, and furthermore individuals that have demonstrated higher emotional intelligence have also shown increased academic performance, then those individuals that only show high self-efficacy and low emotional intelligence (Gharetepeh, Safari, Pashaei, Razaei, & Kajbaf, 2015). Therefore, according to the CareerEDGE model, emotional intelligence is seen as more than just being self-aware of personal strengths and limitations but also a bridge to learning in both academic and workplace settings. Whereas other models have placed greater importance on understanding of how to navigate and communicate verbal and nonverbal interactions through human experience to ensure that individuals are primed to

work with a mindset that is in tune with traversing cross-cultural competencies as presented within a global knowledge-based economy (Dacre Pool & Sewell, 2007).

2.5 Using Analytics and Data to Measure Success in Academic and Workplace Settings

By combining several of the models and potential measures of academic and career success articulated above, there is a possibility to design a newer concise model that will identify student achievement in both academic and professional settings, that is not only specific but has a clearly defined set of standards that fulfil the needs of students and institutions in academia and the workforce. Thus, one attempt at validating the needs of both students and employers, while attempting to identify measurable levels of success that translate forma academic settings into the workplace is the implementation of educational data mining (EDM).

EDM is an interdisciplinary approach to conducting research through varying data points taken from a diverse range of educational contexts (Suhirman, Zain, & Herawan, 2014). Thus, Suhirman, Zain, and Herawan (2014) state that EDM is largely dependent on a process whereby large sets of raw data from educational systems can be moulded into useful digestible pieces of information that relay recognizable patterns and insights into student learning behaviours. The authors also suggest that EDM is useful in developing curriculum focus, as well as enhance academic research areas for improving teaching and learning practices. However, data mining also proves to be a challenge as current data sets have neither been aligned nor standardized to provide detailed insight on the complexity of learners' interaction with content and how they are assessed on their learning (Conley, 2015).

Nonetheless, this has also prompted the formalization of a process for measuring and tracking student data throughout higher education and then continuing into their careers in the workplace (Khousa & Atif, 2015). As a result, employers have become increasingly interested in utilizing data from higher education institutions to identify the next 'top talent'. Khousa and Atif (2015) further indicate that with current analytics software, which are a suite of applications embedded within web-based courses are being utilized to monitor student progress and engagement with material, proposed methods to determine and predict career success and readiness are plausible. However, again specific measurable traits must be agreed upon between all stakeholders including students, educators, and employers prior to implementing technology frameworks.

Moreover, based on the literature presented above, my understanding is that there should also be a conscious effort from all stakeholders to support students to realize cognitive capacity and potential beyond academic settings. Additionally, for such efforts to transfer into the workplace, intervention and involvement of employers directly in academic institutions and classrooms would be required. Thus, though not much research has been conducted around analytics and predictive analysis with respect to career readiness and employability within education settings, it is conceivable given the correct parameters and the cooperation between various stakeholders.

The varying career models provided in the previous section would act as useful starting points for identifying indicators for only either career or academic success, however, would also need to be integrated within technological frameworks as implementing either individually would not suffice as a valid measure of employability on their own. Thus, the next section of the literature review will explore some of the emerging technologies that are claimed to have tracked student performance and success within

academic settings as well as those tools that have also been developed to analyze data in relation to employment performance within the workplace.

2.5.1 Big data and learning analytics.

Traditionally, educational institutions collect and maintain data to track student records relating to demographics and performance criteria of an individual such as their grades and attendance (Fritz, 2011). This type of data is grouped into one of two categories known as static data whereby information about students are stored on local databases and can be controlled within an academic institution (Vatsala, Jadhav, & Sathyaraj, 2017). However, as more and more institutions have implemented the use of social media and online learning platforms including learning management systems (LMS) over the years, various data sets that are grouped into a second category known as fluid data whereby additional information regarding student performance is stored in databases outside of the direct control of institutions (Vatsala, Jadhav, & Sathyaraj, 2017). The vast amount of data, both static and fluid data, are collectively referred to as big data (Chaurasia & Rosin, 2017) which has begun to generate value within institutions specific to student success.

In educational contexts, this includes data that supports in identifying at-risk learners as well as providing potential intervention methods by analyzing information posted within online forums (Siemens & Long, 2011). Vendors that implement LMS platforms have also realized the potential value in analyzing data and have recognized the increasingly important role that institutions can play in supporting with student success and have begun implementing packages within LMS platforms called learning analytics (Wilson, Watson, Thompson, Drew, & Doyle, 2017). Though learning analytics has varying definitions within educational contexts (Viberg, Hatakka, Bälter, & Mavroudi, 2018), the overall application for learning analytics tools are used to provide understanding of learning behaviour for the

benefit of learners in varying settings including within formal, informal, and blended learning environments (Maseleno, Sabani, Huda, Ahmad, Jasmi, & Basiron, 2018).

Some specific implementations of learning analytics tools within education institutions have also attempted to identify best practices for supporting students in acquiring skills, increasing engagement with content, as well as measuring interactions with peers and educators through social networking platforms (Wilson, Watson, Thompson, Drew, & Doyle, 2017). Ultimately, learning analytics and similar tools can also be used to track and identify professional competencies that students are expected to learn while enrolled in courses in preparation for prospective decisions they will be faced with making in professional workplace settings (Khousa & Atif, 2014).

Chaurasia and Rosin (2017) claim that the impact of big data on education has caused a shift in learning, teaching, and what is expected of new graduates entering the workforce. If used effectively such data can offer a competitive advantage to students and provide insight to employers of top talent. As a result, technologies that have the capability to amass substantial amounts of data from within these online platforms into readable and identifiable patterns have narrowed the gap from the time individuals have completed course work and the time it takes to sustain meaningful employment. However, the types of data must be detailed enough so that not only is information intelligible at the institutional level, but that information is made available to external stakeholders and community members whereby data is presented in a form that allows it to be further analyzed in a more automatic, reliable and systematized manner (Pistilli, Willis, & Campbell, 2014).

Additionally, it is also important to note that this concept of sharing information and data between multiple key participants in both academic and workplace settings has been a cause for concern for students regarding ethical practices and use of data along with

obtaining informed consent and maintaining privacy of individuals (Viberg, Hatakka, Bälter, & Mavroudi, 2018). Though there is a clear advantage for individuals to allow institutions to collect their personal data for educators to optimize their learning experiences, and perhaps to connect individuals to opportunities internally within the organization, there are still ethical challenges that need to be worked out prior to passing along individual information to external stakeholders (Siemens & Long, 2011; Vatsala, Jadhav, & Sathyaraj, 2017). However, these developments also do not seem to be advantageous to individuals that have not attended traditional modes of education but have still acquired skills and knowledge to meet job requirements.

2.5.2 Personalized learning environments and adaptive learning.

One likely solution to ensuring privacy and control of data among individuals has been suggested through the implementation of personal learning environments (PLEs). PLEs focus on the individual needs of a student through intervention and adaptation of the curriculum as identified by instructors and educators (Lynch, 2017). Furthermore, personalized learning environments utilize technology such as LMS to not only provide insight into instructional practices for teachers but also allows for tailored instruction to refer to learner preferences of individual students through the consideration of student abilities, interests, and motivations to learn (Maseleno, et al., 2018). Many personalized learning environments consist of a technology-based tools and online learning activities that extend, supplement, and combine in-class instruction (Svenningsen, Bottomley, & Pear, 2018).

One example of this integration of PLEs within LMS architecture to develop a personalized learning experience for its students attending the university is an application created by researchers at the University of Technology Malaysia and Malaysian Ministry of

Education called iMLearning (Chee, Yahaya, & Ibrahim, 2018). Chee, Yahaya, and Ibrahim (2018) recognized the increased usage of mobile technologies such as smartphones and tablets within the student population and designed iMLearning as a Formulated Ideal Personalised Social Collaborative Mobile Learning Environment (FIPSCOMOLE) platform for formalized and social learning. The authors have indicated that the iMLearning platform was utilized as a portal that was already integrated into pre-existing LMS architecture that also included additional web applications such as Social Networking Sites (SNS), and media such as audio and video dispersed throughout the internet to comply with varying learning needs of individuals.

Thus, personalized learning tools and technologies have allowed this process to serve a much larger number of students through automated practices thereby creating individualized adaptive learning experiences based on students' understanding of and connection with the content. By setting up these types of environments, it is the students themselves who take ownership of their learning and data. Due to its portability – such that individuals can take their information with them rather than relaying on commercial or institutional centralized control of data, such information can be transferred to other systems at the discretion of the individual thereby alleviating some issues surrounding privacy and control of learning experiences (Lynch, 2017). Furthermore, if portability is enhanced, then it helps to level the competition for those individuals learning in non-traditional settings. In other words, learning has become accessible to the point that applications like iMLearning described above provides opportunities for learners to control the pace at which they learn in a much more engaging fashion and that is more convenient through mobile platforms that are more cost efficient and overall easier to maintain (Chee, Yahaya, & Ibrahim, 2018).

On the other side of the spectrum, adaptive systems such as Intelligent Tutoring

Systems (ITS) which simulate an environment for students to learn in a one-to-one

interaction without having a human teacher present have been studied for many decades,

are now better able to integrate advances in technology and social platforms to provide

learners with more adequate support in learning (Luckin, Holmes, Griffiths, & Forcier, 2016).

At the same time, ITS can support educators in identifying how to progress in the

implementation of teaching strategies to improve student experiences (Wilson & Scott,

2017). There are also some initiatives that suggest that adaptive learning technologies can

even be taken one step further, such that both learning management systems and social

media sites can tap into all this information pertaining to learner preferences. Learning

environments such as Moodle and even enterprise environments such as Blackboard, as

well as social media sites such as Facebook, Twitter, and Instagram have all increased their

ability to collect fragmented information across multiple platforms which could potentially

provide even greater insight into learner preferences and how content can be modified and

adapted to meet learner needs both within a classroom and in their personal lives (Kay,

2008; Hopkins et al., 2018).

2.5.3 Business intelligence, performance management and people analytics.

The conceptualization of data collected from multiple sources across large

interconnected networks has provided individuals with opportunities to enhance learning

autonomy and gain control over their learning experiences through personalized learning

environments (Kay, 2008). At the same time, it has also given rise to alternative methods to

improve business practices through recommender systems which match users with items

and services based on their specific preferences (Portugal, Alencar, & Cowan, 2018). Some

examples are Uber, Yelp, and Netflix which rate user experiences during a commute or

having a meal at a restaurant and even making suggestions on what movie to watch based on personal interests and previous patterns of viewing content. With respect to the interconnections between education and the workplace, companies such as LinkedIn which were originally used as a job search site have also utilized recommender system algorithms (Portugal, Alencar, & Cowan, 2018) that have attempted to support the transition of qualified graduates and candidates and match them with potential career opportunities, integrating the use of academic records not only to inform recruiters of qualified candidates for a role, but also to inform schools and the individuals enrolled in academic institutions which courses to take to enhance skillsets and knowledge pertaining to a particular field of study (Baneres & Conesa, 2017).

The core idea and use of business intelligence technologies is grounded in the mass collection and aggregation of data from varying platforms which has proven to drive business needs forward. It comes as no surprise that companies like Amazon, Facebook and Google have based their entire company models on collecting datasets and then utilizing such information to make decisions that aim to increase sales but also to enhance experiences for users by pointing customers directly to products and services that suit their niche (Lynch, 2017). Business Intelligent Systems work in a similar fashion to PLEs such that data collected from various sources is then translated into useful and meaningful information that, together with additional analytical tools and the support of human analysis, is then converted into knowledge that can suggest decisions to be made for progression of business practices and what customers can buy next (Portugal, Alencar, & Cowan, 2018). Business intelligent systems have also paved the way for the implementation of other services such as people analytics, whereby industry leaders are investing in better platforms to recognize patterns in data to understand employee performance and

behaviour and provide measurable feedback to increase return on investment (Isson & Harriott, 2016).

However, both people and learning analytics are still in the infancy stages whereby much of the data that is collected from such systems is made up of mostly unstructured raw data which requires further human intervention and analysis to be useful for students and educators in academic institutions and stakeholders within the workplace (Negash, 2004; Sivarajah, Kamal, Irani, & Weerakkody, 2017). Sivarajah, Kamal, Irani, & Weerakkody, (2017) state that there are many other drawbacks and challenges that come along with the implementation of technologies supporting big data and analytics that are sorted into three distinct categories which include data challenges, process challenges, and management challenges. The authors define each of these categories in relation to challenges of implementing big data as follows:

- Data challenges relate to the characteristics of the data itself (e.g. data volume, variety, velocity, veracity, volatility, quality, discovery and dogmatism).

- Process challenges are related to series of how techniques: how to capture data, how to integrate data, how to transform data, how to select the right model for analysis and how to provide the results;

- Management challenges cover for example privacy, security, governance and ethical aspects. (p. 265)

Therefore, though big data and analytics can prove to be useful in determining academic success of an individual, appropriate measures should also be made when considering the type of data collected, how data will be processed, and whether there are adequately trained individuals in dealing with the data such that potential breaches in information do not happen.

2.6 The Need for a New Learning Paradigm that Drives Success

The complex network and interconnectedness between academic, technical, professional and life skills and related attributes have been emphasized throughout this chapter. The skills and attributes students should learn associated with their transition into the workplace from academic settings are becoming easier to track due partially to the unstructured and formless nature of data that is collected (Negash, 2004; Sivarajah, Kamal, Irani, & Weerakkody, 2017) but also to the constantly changing field of IT (Joseph, Fong Boh, Ang, & Slaughter, 2012; Kappelman, Jones, Johnson, McLean, & Boonme, 2016), as well as the changing landscape in which individuals learn. Though technology such as learning analytics and business intelligent systems in online settings have helped in making sense of data, there is still a need to align and integrate varying disciplines (Van Der Heijde & Van Der Heijden, 2006) to keep up with the exponential rate of changing environments as dictated by technology trends and motivations of the individuals themselves. Matus and Talburt (2015) claim that students are left confused about what to focus on and are either unemployed, underemployed, or underperforming within school and the workplace and are making decisions based on their self-assessment of skills and related experiences rather than through directed guidance provided by academic institutions and educators.

Though learning concepts and employability models discussed within this chapter have attempted to address and narrow the gaps of confusion and develop a clearer understanding of success which bridges academia and the workplace, there is a need for a new learning paradigm within a digital age that is inclusive of a mixture of aspects presented in these models to support academic, professional, and personal growth within an individual. Within this melting-pot of concepts and ideas surrounding success in academic and career settings is a common grounding that learning is understood as a continuous

multifaceted process. Siemens (2005) and Myers and Adams-Budde (2016) state that learning no longer follows a linear path, nor does learning happen in one way or within a single framework taught by any individual institution who is considered the gatekeeper of all knowledge in an area of expertise.

As the IT industry continues to embrace decision making based on big data and technologies from numerous social platforms that help support judgements to improve business practice, educational institutions should also understand that external sources such as social media and competing online education formats have already organically provided students with personalized and informal learning experiences beyond traditional settings (Kay, 2008). The preconfigured syllabus and structured methodologies of brick and mortar classrooms that do not integrate or resist the importance of these external experiences of a learner's journey will lose validity in today's global knowledge race (Myers & Adams-Budde, 2016).

From this new perspective, and from what has been gathered from the literature above, there is an inferred accusation that many educational institutions have been focusing on the *what* to learn, and not on the *how* to learn or specifically *how* and *where* to find information (Siemens, 2005). As technologies are getting better at not only disseminating knowledge but also aggregating useful data for identifying what, where, and why students should learn in order to work toward earning credentials in a specified industry such as IT, the educator's role should resemble a conduit for supporting student learning (James, Guile & Unwin, 2013; Pistilli, Willis, & Campbell, 2014).

To fully comprehend this conceptual framework as a basis for the focus on how students learn, how educators teach, where information is accessed, and what employability skills organizations are looking for within a digital age, the following chapter

will explore both traditional perspectives using learning theories such as constructivism and more modern theories such as connectivism as a basis for determining links between learning and indicators of success. These theories presented will help provide a basis for understanding how individuals and organizations navigate within a socially constructed world where data is informing decision-making and encouraging personalized learning experiences outside of traditional formats into digital learning spaces and how this can translate into successful employment outcomes for young adults entering the IT industry.

CHAPTER 3 THEORETICAL FOUNDATIONS

3.1 Introduction

In this chapter, one of the traditional learning theories known as constructivism and a more contemporary theory known as connectivism will be explored to determine the need for a new learning paradigm that provides insight into the success of an individual's learning journey and how these experiences transition from academic settings into the workplace. Considerations surrounding limitations and criticisms of both constructivism and connectivism will be clarified. Justifications and rationalizations of why a planning practice in accordance with these theories should be considered to prepare young minds for the shift in the 21st century global knowledge landscape caused by rapid adoption and disruption of technologies within digital and blended environments will also be further discussed. Lastly, the chapter will conclude with a more in-depth look at the research questions that were presented in Chapter 1, that combines perspectives through both a constructivist and connectivist lens which will further support the direction of the research that is presented in more detail within later chapters of the paper.

3.2 The Constructivist Paradigm

At the turn of the 20th century, Piaget (1953) conceptualized the notion that knowledge is not transmitted between individuals but rather constructed or discovered by the individual through the contexts of their core experiences. An example of this can be seen through traditional lecture formats when a teacher is speaking to a group of learners, and each student may have not heard or processed the message differently from everyone else. As a result, individuals develop their own meaning based on what they already know and experiences they've already had, thereby developing a whole new view of the world

around them (Von Glasersfeld, 1998). Thus, the teacher's role from a constructivist perspective evolves from being the sole proprietary knower to be a guide, coach, or facilitator for the student, and supporting learners through active inquiry of the topics presented. This allows individuals to construct their own understanding of themes that have been formed from the topics and concepts through self-discovery (Kerka, 1997).

One of the major implications of learning through a constructivist lens is that learners are consistently making sense of the information presented to them in their individual contexts so that they move from a state of lower level of thinking to higher levels of thinking (Amineh & Asl, 2015).

However, the above only describes one of two different views of learning from a constructivist perspective. This first view is known as individual constructivism as presented by Jean Piaget, which aptly explains the individual's journey in learning through varying stages also known as cognitive development theory. The second interpretation of constructivism is known as socio-cultural constructivism generally attributed by Lev Vygotsky's contributions to the fields of language and communication theory mediated through the social contexts related to society (Kanselaar, 2002).

With respect to the former view, Piaget placed a large emphasis on constructivism as a process of learning from the internal or intrinsic interpretations of experiences of an individual. There are varying stages of discovery where learners are exposed to ideas that they either subconsciously accept or reject (Amineh & Asl, 2015). Piaget's explanation of constructivism states that there are three distinct processes which support the development of an individual's learning which are assimilation, accommodation, and equilibration together known as a subset of Piaget's genetic epistemology (Pritchard & Woollard, 2010).

- Assimilation is the process of new understandings of knowledge that are integrated into existing models of reality or pre-existing mental structures of an individual.

- Accommodation is the process which follows by which new knowledge conflicts with existing mental structures which are altered and modified to fit a newly defined model of reality.

- Equilibration is when there are no longer contradictions or conflicts between existing and new knowledge that have been gained throughout the process for the individual (Pritchard, 2009).

Though this process adequately explains how an individual learns at different stages of their intellectual development (Amineh & Asl, 2015), it often misconstrues Piaget's genetic epistemology as being much too linear and simplified (Pritchard & Woollard, 2010).

3.3 The Social Constructivist Paradigm

Like individual constructivism, social constructivism as explained by Lev Vygotsky still considers the individual as an active learner that constructs their knowledge based on experiences (Pritchard, 2009). However, unlike individual constructivism, Vygotsky explains that learning is also mediated by an individual's surrounding environment, community, and cultural context (Kanselaar, 2002). Vygotsky has indicated that there is a direct relation and integration between an individual's intellectual and social development (Liu & Matthews, 2005). Social constructivism has roots in three main assumptions surrounding reality, knowledge, and learning (Kim, 2001).

The first assumption is unlike individual constructivism that reality cannot exist ahead of the construction of properties about the world that surrounds an individual but

rather reality is developed within groups of people that discover and construct realities through social and human activity together (Kukla, 2000). The second assumption indicates that knowledge is a product of human interactions between individuals, and is socially and culturally constructed (Kim, 2001; Amineh & Asl, 2015). Lastly, the third assumption is that learning is a process that occurs as individuals interact with each other through social activities that encourage collaboration and communal efforts (Amineh & Asl, 2015).

As can be seen, Vygotsky places great emphasis on the social interactions between people as a pertinent process directly connected to the success of an individual's intellectual growth (Pritchard & Woollard, 2010). Additionally, Vygotsky attributes success of an individual based on their cognitive growth through the fostering of social interactions as being within the zone of proximal development (ZPD) (Pritchard, 2009). The ZPD is defined as the distance between the [child's] actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers (Vygotsky, 1978, pg. 131).

Thus, learning best occurs through social intervention and facilitation of others that have an understanding and capabilities of specific subjects to support the individual's intellectual growth toward higher levels of cognitive transformational shifts (Pardjono, 2016).

A frequent criticism and limitation of Vygotsky's approach to learning and models of intellectual growth is that there has been little empirical evidence that social interactions between people differ from individual constructivist perspectives of learning and cognitive development (Liu & Matthews, 2005). Additionally, like criticisms of Piaget's individual constructivism, learning from an individual perspective seems to occur in a linear fashion,

49

though Vygotsky has stated that individuals move through the varying levels of ZPD, the dependency on external guidance of more capable individuals, until point at which the individual themselves becomes the "more knowledgeable other" (Pritchard, 2009, pg. 15).

Due to this, though active learning is still evident, individuals are situated in and restrained by their context and limited based on the accessibility to subject matter experts that can help guide their learning and cognitive growth. This linear learning model no longer applies to the ubiquitous nature of information to which technology has widened access within the 21st century. Therefore, what both Piaget and Vygotsky have provided is a basis and framework with which to further extend concepts of learning and explore the effects of new mediums and ideas that support this notion such as from a connectivist perspective (Kivunja, 2014).

3.4 The Connectivist Paradigm

As determined earlier, from both the perspectives of Piaget and Vygotsky, learning from a constructivist perspective assumes that knowledge is constructed through experiences and social interactions and then resides within the individual mind. Furthermore, as a result of these encounters with experiences and creation of new realities, there is an increased cognitive growth and development exhibiting and increase and understanding of the world through newly constructed perspectives. Connectivism, on the other hand, a framework introduced by George Siemens, argues that not only does knowledge reside within the individual mind but that knowledge can also exist across a myriad of complex distributed networks on two distinct levels:

1. Internal neural networks – the physical transfer and distribution of knowledge within the brain but not limited to any one specific location;

2. External networks – each node (external to our brain) including people and other content sources within a network represents an aspect of what is learned through connections that are formed between the nodes and an individual (Siemens, 2006).

Thus, connectivism implies that learning is a process that is holistic, ubiquitous, and non-linear. It accepts technology as a driving force to developing new learning and thinking and perceives learning as a networked phenomenon influenced by technology and socialization (Siemens, 2006; Goldie, 2016). Siemens (2005) further argues that there are several implications to consider that challenge previous learning theories that do not sufficiently address the impact of technology on modern learning practices. Based on Siemens' reasons, there are a set of principles that summarize the constantly shifting and rapidly altering foundations of learning which are:

- Learning and knowledge rests in diversity of opinions.

- Learning is a process of connecting specialized nodes or information sources.

- Learning may reside in non-human appliances.

- Capacity to know more is more critical than what is currently known.

- Nurturing and maintaining connections is needed to facilitate continual learning.

- Ability to see connections between fields, ideas, and concepts is a core skill.

- Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.

- Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision (Siemens, 2005).

From the educator's perspective, the above principles may seem to say that individuals are responsible for constructing their own learning, which lies somewhere in between the autonomous nature of individual constructivism and the emphasis on social interactions as provided by social constructivist frameworks. This is because connectivism is not meant to discard any of the older theories but rather build on them (Kop & Hill, 2008).

In contrast, Siemens (2005) indicates that one noticeable difference between constructivism and connectivism as identified through the principles is that the latter acknowledges that the tools by which individuals learn are consistently in a state of change, such that how people learn is largely based on the tools in which to acquire knowledge through varying technological mediums.

There are many criticisms of connectivism, a major one being that connectivism restates and validates what constructivist theories have already effectively tackled with respect to learning and knowledge (Verhagen, 2006). Though the impact of technology has warranted the need for a new paradigm addressing the changing landscape within which individuals learn, connectivism supports a new emergence in pedagogical practice rather than being a learning theory in its own right (Kop & Hill, 2008). However, regardless of the implications and status among educational theorists within the academic sphere, connectivism (along with constructivism) provides valuable insight into how to conceptualize new models of learning that support real world contexts outside of the classroom such as within the workplace.

3.5 Applications of Constructivism and Connectivism in the Workplace

In Chapter 2, I acknowledged that there are clear gaps in literature between understanding the impacts of technology trends with respect to informing decisions through

data and analytics to develop insights on success factors of an individual within academic and workplace settings. Figure 3.5-1 below showcases the interconnecting domains as knowledge being constructed from external influences that move an individual toward successful employment outcomes.
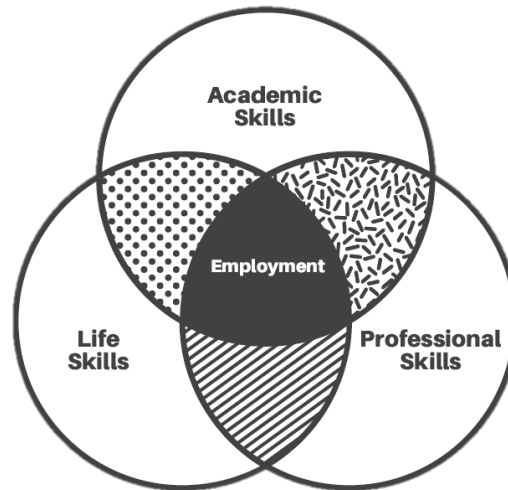
Figure 3.5-1 Interconnected domains of knowledge in relation to employment

The diagram, like the literature, represents what an individual has learned or needs to learn to obtain employment. However, there are no indications of how the learning itself occurs or more detail on where knowledge is collected to inform objective and subjective success. The diagram is also a representation of an individual developing varying skillsets to succeed with employment placed at the core of the model. However, Siemens (2006) asserts that engaged learners do not exclusively learn for purposes of increased chances of obtaining employment but rather do so to make sense of their environment and grow personally in order to contribute and positively impact the world. Therefore, the core of the model could shift or transform into other subjective qualities of success according to what any individual deems as valuable and important to them yet keeping the outer domains intact.

53

Fullan (2001) claims that many educators are fixated on the single purpose of education which is to develop each student graduating from higher education into a valued citizen in the 21st century global knowledge economy. Despite this, Trilling and Fadel (2009) argue that many students attending and graduating from these higher education institutions are lacking the necessary skills due to the integration of technologies causing a pedagogical shift in how individuals communicate, collaborate, and learn. Thus, from a social constructivist perspective, individuals must be trained to be able to engage with people within their work environment. Moreover, they should not only be adequate at developing relationships with people around them but must also be able to construct meaning from their personal histories as a part of developing workplace relationships (Loftus & Higgs, 2010).

Loftus and Higgs (2010) state that an implication of embracing this perspective is that learning within the workplace becomes reliant on social interactions alone, and there is a risk that individuals are left to construct meanings on their own without intervention or guidance on how to interpret these interactions. Thus, in addition to providing healthy social environments, workplace settings should also encourage active and routine support aimed at moving learners to higher levels of complexity encouraging problem-solving (Kerka, 1997). This view is akin to moving to higher levels of thinking as demonstrated earlier in Vygotsky's ZPD framework.

From a connectivist perspective, not only is the social and active seeking of knowledge from a personal stance important, but the additional opportunities for individuals to learn through technologically interconnected and collaborative environments is also a vital aspect of success for any professional. Thus, a new workplace learning

paradigm should consider how traditional paradigms will include the need to be technologically proficient within 21st century contexts (Kivunja, 2014).

3.6 Reframing Research Questions

Based on my own experiences with learning and teaching, I have found that I have defaulted to constructivist ideals and frameworks. However, as I continue to learn and improve both my personal and professional practice, I am noting the inclusion of connectivist principles that are becoming more in tune with my understanding and how I value knowledge. My perspectives on reality, knowledge and learning have changed and continue to evolve daily due to the consumption of content through various technology mediums. Thus, to be successful in one's learning journey from academic settings to the workplace, and in other contexts, I've learned that it is the responsibility of the learner to be in control of what they need to know rather than what they already know.

Siemens (2005) states that it is the 'pipe', or in other words the medium through which content flows, that is much more important than the content itself. Therefore, the networked potential of varying nodes through various mediums is what allows us to connect knowledge to gain a better understanding of the world around us. As a result, this changing knowledge landscape has also prompted me to restate the research questions to adequately include both the constructivist and connectivist perspectives that have been presented throughout the chapter.

The original research questions that were stated in Chapter 1 were:

- What does success look like to students entering and working in the IT industry?

- How do skills that determine academic success link to measurable levels of employability for these students?

The reframed questions that include more specific details comprising of my understandings and inclusion of theoretical foundations are:

- How is student success perceived by varying stakeholders towards individuals entering the IT industry?

- How do skills that determine academic success connect to measurable levels of employability for these students?

As can be seen, the subtle changes in the first question, from "what" to "how" with the added mention of "stakeholders" allows for a greater variation of understanding from different perspectives rather than only the student perspective as stated in the original question. Additionally, the word "perceived" in this question affirms the constructivist notion that various individuals construct their own understandings of knowledge based on the personal experiences they have endured. The second question comprises of a deliberate change from "link" to "connect" to explore various internal and external networks that hints at a more connectivist perspective rather than a constructivist one.

CHAPTER 4 RESEARCH DESIGN

4.1 Introduction

This chapter will explain the ontological and epistemological basis for my research. Additionally, this section will examine my rationale for implementing a qualitative methodology, specifically, an interpretative phenomenological analysis, to support and identify major patterns and themes that have emerged throughout the study. This portion of the paper will also provide insight into how and why certain methods were applied to collect insights of participants in the study and explanations of ethical considerations that were considered. Finally, this will conclude with a detailed look at the process and analysis of how data has been collected based on the methods described throughout the chapter.

4.2 Ontological and Epistemological Perspectives

According to Crotty (1998), "ontology is the study of being. It is concerned with 'what is', with the nature of existence, with the structure of reality as such" (p. 10). Therefore, the methodological stance in which my research has been conducted is aligned with an ontological belief that there are multiple versions of realities and that success is subjective and shaped by the experiences and the context of participants involved in the study. Guba and Lincoln (1994) further assert that from a relativist perspective that truth does not exist without meaning. Thus, as this research is investigating perceptions of success within academic and workplace settings, depending on how varying individuals define success and what skills or competences have attributed to their success, there will be different truths and variations of truths to be explored further in detail. Creswell (2007) states that to conduct qualitative research that has a sound ontological basis, it is important that the subjective experience as explained through the words of participants must be as

used as evidence to differentiate one understanding of a specific event from how others have experienced a similar event or lived experience. Thus, the underpinning framework of this study and my understanding as a researcher is that the nature of reality is subjective in nature and the intention is to validate these varying views from multiple perspectives. It is also understood that from a constructivist perspective that these views may change as individuals obtain more knowledge and begin to challenge their presumptions of the world and realities around them to develop newer constructs (Guba & Lincoln, 1994).

Hence, as determined from my ontological position, my epistemological stance is then defined by how multiple realities are interpreted (Crotty, 1998), and unlike quantitative studies, qualitative studies require that researchers are directly in contact with participants of the study. As a result, my epistemological position is aligned with what Guba and Lincoln define as "subjectivist assumptions that sees knowledge as created in interaction among investigator and respondents" (p. 111). Therefore, given the nature and disposition of my current role as a lead instructor providing training to youth and professional context as the Senior Education Manger in relation to the participants involved, a qualitative approach to this study seemed not only suitable but also aligned with my appreciation for theoretical perspectives linking both Vygotsky's (1978) social constructivist paradigm and Siemens (2005) principles of connectivism as discussed in Chapter 3.

4.3 Methodology

Qualitative studies are ideal for generating and developing new theories that emerge from data collected from individuals through narratives, interviews, and discussion. This specific qualitative methodological approach is further described as an inductive logical

methodology while its complement, deductive logic, is generally reserved for supporting quantitative research (Creswell, 2007). However, Guba and Lincoln (1994) state from a constructivist paradigm and worldview, inductive reasoning when paired with the idea of making meaning from shared experiences of participants within the study provides focused insight into how people perceive the world around them. Thus, this study immerses itself in developing evidence and theories that define how knowledge and data is understood from a qualitative perspective and an interpretive framework whereby context holds the greatest emphasis with respect to defining and developing a consensus regarding qualitative data.

4.3.1 Phenomenology.

Though I have adopted a qualitative approach to attempt to answer my research questions and provide insight into the meaning behind the narrative data collected from the participants of the study, the specific qualitative methodological approach that I have embraced within this study is an interpretative phenomenological analysis (IPA). The emphasis on implementing an IPA is directly correlated to the idea of hermeneutic phenomenology such that IPA is focused on understanding how an individual interprets or seeks meaning from an experience, and hermeneutics further develops how the researcher then interprets the meaning of the lived experience of these individuals (Smith & Osborn, 2004).

In the case of this research study, the interpretative analysis is to understand the subjective experiences of individuals and their insights into how the connections between academic and career success inform and drive personal definitions of success. The challenge then is to decrease the amount of personal bias and look at what is valued from the

narrative accounts by most of the participants and defer my own description and perception of success.

An additional rationale for adopting this specific methodological qualitative approach to research as opposed to other forms is that IPA has been considered to have inherent commonalities with the sense-making properties of connectivism as experienced in external artefacts and experiences through social contexts as explored in Chapter 3. There are overlapping concepts between social constructivist perspectives, connectivism ideals and integrative methods of interpretative phenomenological analysis.

4.4 Sampling and Design

4.4.1 Participant information.

Participants of the study included individuals selected from three distinct but interrelated categories: students, employers and staff. All participants have a common connection to participating within a non-profit job and IT skills program based in Canada. The IT skills program offers intensive technical, professional, and personal development training to underserved young adults between the ages of 18 to 29 who have faced varying social and systemic barriers preventing them from obtaining higher education or sustained employment. The program is conducted at no-cost to the participants. The goal of the program is to adequately prepare young adults with in-demand skills sought by top employers within the IT industry and serve as a pipeline to connect employers with young adults that have successfully completed the program. The resulting outcome is that young adults jumpstart their career within meaningful employment opportunities in IT-related jobs and employers obtain talented and eager employees that are prepared and ready to work.

My role within the organization as the Senior Education Manager is two-fold. Firstly, as an educator my responsibilities to deliver technical training and coaching to students ensuring they earn globally recognized certifications and are prepared to present themselves in professional settings. Secondly, I am also responsible for consulting with industry partners and subject matter experts to identify gaps and employment needs within the IT and digital skills marketplace. Based on findings, I then recommend, suggest, and create engaging training material for review by internal management and external partners whereby solutions are then integrated back into the program and shared with staff to deliver material to better support students enrolled in the program. Thus, by conducting research for this thesis, it is my hope that my findings will further help and support the overall growth of the organization and will benefit students, employers, and staff alike.

With respect to selecting candidates to become involved with the research, though dozens of students and employers were contacted, a total of 19 participants were involved in the study comprising of 8 students, 6 employers and 5 staff, however each group of participants were selected based on different inclusion criteria as listed below.

For students they had to:

- Have successfully completed and graduated from the non-profit job skills and IT training program;

- Have been working for at least the past 6 months within the IT industry at the time the study was conducted;

- Have not completed a higher education degree/diploma or they may have completed a degree/diploma unrelated to IT prior to successfully completing the non-profit job skills and IT training program;

- Be between the ages of 18 to 29 at the time of completion of the training program.

For employers they had to:

- Have demonstrated direct management or involvement with students from the non-profit job skills and IT training program within at least the past 6 months at the time the study was conducted.

For staff they had to:

- Have been employed within the non-profit job skills and IT training program and have worked directly with youth that had completed and graduated from the program;

- Be currently working in a department for which I am not responsible in terms of direct inline management of any of the staff.

Furthermore, the total number of participants that were selected were based on both practicality and at the point of saturation. Prior to beginning my research, a predetermined number of 8 students and employers was originally selected based on my current accessibility to reaching participants within a respective timeframe. However, as I have indicated above, though I was able to interview 8 students, I was only able to reach 6 employers, and though it is not possible to determine the point at which data is saturated within a qualitative study using semi-structured interviews (Bernard, 2012), I was able to determine when information was being repeated by individuals. One strategy as suggested by Guest, Bunce, and Johnson (2006) that I had implemented at the time of analysis was ensuring the questions that I posed during the interview (see Appendix D and E) were structured in the same manner for all participants. By doing this it allowed me to determine whether repeated answers and patterns were evolving in a straightforward and logical

manner, at which point I was able to determine that information was indeed saturated, and I could then confidently move to the next phase of my research. As for the number of program staff that I was able to successfully recruit and interview, these were the number of individuals that I was able to gather based on the indicators as determined above at the time the research was being conducted.

4.5 Rationale and Challenges of Qualitative Research Methods

4.5.1 Importance of narrative analysis and inquiry in qualitative research.

As determined from my understanding of the epistemological foundations of research, narrative analysis and inquiry offers an opportunity for researchers to determine what aspects of stories expressed by participants are representative of common themes or practices that a majority have experienced as well as to explore what differences in opinions and perceptions of a topic can be identified. Additionally, narrative research can be used to investigate and delve into both the internal conceptual understandings of each individual participant as well as the external influences on individuals based on social behaviour and conditions with which they are faced (Squire, Andrews, & Tamboukou, 2008).

It is also argued that narrative inquiry also provides opportunities for researchers to engage in reflexive practices thereby enriching the ethical validity and accuracy within the realm of social research by shedding new light on a researcher's self-awareness and views that may have otherwise gone unnoticed prior to conducting their research (Bishop & Shepherd, 2011). Thus, the increased ethical reflexivity and interpretation of shared experiences along with the sustained nature of narrative self-interpretation allows for narrative research to unveil a meaningful continuum of rich experiences to be further analyzed (Meretoja, 2014). As a result, the increased reflexive nature of narrative analysis

also increases opportunities to include honest representations and inclusions of personal narratives that shape the interpretations of qualitative data presented by the researcher themselves (Bishop & Shepherd, 2011). Therefore, narrative research is a complex web comprising of dialogical narratives stitched together with cultural experiences interpreted both by individuals and by retrospective insights provided by the researcher, which in and of themselves can further be analyzed by others as a narrative account of a purpose or theme (Meretoja, 2014).

A few of the challenges with classifying narrative inquiry with this specific reflexive and ever evolving nature and discourse is that anything and everything can be categorized as a narrative (Elliot, 2005). For this reason, it is important to acknowledge and recognize that, though it may not be possible to completely remove a researchers' intersubjectivity with the shared experiences of participants, there is an even greater need to include personal transparent accounts of lived experiences throughout the duration of the study. This tactic ensures that there is a clear indication of what portions of understanding and knowledge have been reconstructed because of continuous reflexive practice by the researcher themselves (Bishop & Shepherd, 2011). Thus, by selecting an array of employers, students, and staff to interview within in this study, I was able to determine what supports and challenges my personal perspectives and perceptions of success, and through interpretive analysis it became possible to construct new experiences that shape new meaning on how the world is viewed.

4.5.2 Importance of focus groups in qualitative research.

In general, some advantages of collecting sample data through focus groups are such that if conducted correctly they can support other conventional data techniques such as

literature reviews and interviews (Kitzinger, 1995). A major reason for utilizing focus groups

in this study, was to further analyze data collected through narrative accounts of students

and employers from semi-structured interviews. Additionally, as all participants within the

focus groups have similar experiences concerning relationships with students and employers

within the same institution, focus groups can provide insight into the common values and

norms that are exhibited within the organization (Kitzinger, 1995).

One disadvantage of focus groups is that the commonalities between members in

the workplace can also prove to be uncomfortable for those who wish to express

perspectives on details that have become cultural norms within the organization that they

perhaps personally disagree with. There is a tendency for a group of individuals to agree

with one another to conform to norms rather than develop original ideas without feeling

excluded or ostracized from the rest of the group (Dimitroff, Schmidt, & Bond, 2005).

However, this can be circumvented provided the facilitator/researcher ensures that the

setting and structure of the meeting encourages open discussion without judgement.

Moreover, though focus groups are ideal for accessing group norms, this method can

also be utilized to challenge norms and elicit changes or improvements to be made within

organizational structures (Bloor, Frankland, Thomas, & Robson, 2001). Further benefits for

using focus groups are also used to determine and analyze both patterns between

participants interviewed, in this case between students and employers, but also what

conflicting information has attributed to phenomena related to success factors (Harrell &

Bradley, 2009). Thus, another purpose for implementing this approach to qualitative

research is to tease out inconsistencies or challenges and provide deliberate awareness of

processes and policies that can spark proposals for institutional change within the organization.

4.6 Methods.

To align with an interpretive phenomenological approach to my research, there were a series of steps involved to collect an adequate amount of qualitative data to attempt to answer the research questions. The first step in my research was to conduct and transcribe information from semi-structured interviews addressing questions specific to the experiences of students and employers with respect to their perceptions and interpretations of academic and career success in the field of IT. A series of questions were prepared in advance to guide the interview and discussion; however, these were only used as a basis for initiating discussion. Furthermore, the questions for both students (see Appendix D) and employers (see Appendix E) remained relatively the same but varied slightly based on the responses and context provided by each participant to further explore and probe ideas presented.

Each interview lasted for approximately 30 minutes per participant. As stated earlier, interviews took place in-person, over the phone, or online using Google Hangouts or Skype, whichever method the participant preferred and felt comfortable and precautions were made to ensure privacy. During the interview, I transcribed all dialogue by typing responses into a word processing software such as Microsoft Word and used the questions that I had prepared to guide the discussion. Once interviews were completed, I removed any identifying information such as names, company names and any other identifying

information. I then stored transcripts on a secure password protected hard drive and cloud that is kept in a locked cabinet in which only I have access to.

As data was collected from participants through semi-structured interviews, the second step of my research was to codify narrative content to determine any common themes between participants. To support this process, I utilized a software called NVivo© which supported in organizing and analyzing all the qualitative data into categories based on common responses (see Appendix I and Appendix J). Utilizing this process, I was also able to further anonymize data to minimize as much of my personal bias as possible. NVivo© was also used to speed up the process of coding information manually from transcripts. The software allowed me to insert all qualitative data, find common themes based on questions posed, use word queries and create nodes that are based on common themes identified throughout the interviews. If this was done manually the process would have taken a lot more effort and time, and I would not have been able to compare data from different interviews in the same manner as the software allowed.

Once common themes and codification of data was completed using NVivo©, I was able to develop a brief survey ranking sheet (see Appendix F) based on findings from the semi-structured interviews. Details outlining how the specific categories that were selected to be placed within the survey ranking sheet will be further discussed in Chapter 5. However, the survey ranking sheet was used as a priming activity within the focus group with staff to spark discussion based on findings from previous interviews with students and employers. Additionally, a list of questions (see Appendix G) to lead a discussion were also prepared in advance to further support and guide the focus group toward the investigation

of specific themes derived from the semi-structured interviews for both students and employers.

The focus group was comprised of 5 staff from varying departments within the non-profit IT skills and job training program. All staff were contacted via email and were provided information about my research, like the employers and students, they were also provided with the Participant Information Sheet and Consent Form (see Appendix C). Once forms were returned signed and initialled, forms were converted to a PDF, password protected and stored on a secure external hard drive and placed in a filing cabinet that only I have access to. I then provided a few dates and times via email that would work for everyone to meet, though it took a few days to arrange a time that suited everyone's schedule. The day of the focus group discussion took place in a secure room behind closed doors in which only staff and I had access to. The duration of the focus group lasted for approximately an hour. All information was transcribed and typed using Microsoft Word and categorized into columns for each participant in a tracking sheet (see Appendix H). Once the focus group discussion was completed all identifiable information from the tracking sheet was removed and then information was reparsed through NVivo© (see Appendix K) for further analysis in similar fashion to what was done with semi-structured interview as explained earlier.

My reasons for utilizing semi-structured interviews with employers and students, and then focus groups for staff were intentional. Firstly, this specific research design was chosen because of the practicality and accessibility of contacting participants. Throughout the data collection phase of my research, it was challenging to get a hold of employers and students one-on-one than it was to get a hold of staff as stated earlier in the chapter. This

was mainly because both employer and student groups were working full-time it was much easier to arrange times after work hours to setup a meeting. Though a few participants, 1 student and 1 employer were able to meet for an in-person interview, majority of the employers and staff were available for a phone call or through online video chat rather than meeting face-to-face, thus if I had to arrange focus group discussions among these two groups, the data collection would undoubtedly be delayed due to anticipated scheduling conflicts between participants. Secondly, I felt that arranging individual interviews would provide candid reactions to questions without participants feeling judged by other opinions, and I felt it would also increase the level of privacy and trust between myself and those being interviewed. Additionally, I also considered the competing views of companies represented by employers, as many of the employers and students involved in the study may know each other professionally, as the IT community in my context is very small, I did not want there to be any conflicts of interest between companies and individuals which would have perhaps skewed the type of data I had originally collected.

As for the focus group discussion, from a professional perspective and as an individual who works on the front-line with students, I wanted to determine how other members within the organization perceive the work we do based on information provided by the student populations we serve and the employers that we partner with. The hopes for this research other than finding answers to the research questions was also in hopes to spark interest internally within the organization to continue to develop and improve the quality of programming within the organization that supports the company's mission and vision while continuing to make strides in social impact.

4.7 Data Collection and Initial Analysis of Findings

As stated earlier in the chapter, most of the information collected for this research study consists of narrative data taken from semi-structured interviews and a focus group discussion. The following section will explain my initial phases and process of collecting, parsing, categorizing and codifying.

4.7.1 Coding and categorizing semi-structured interview data.

Once semi-structured interviews were conducted and all participants (i.e. employers and students) that had submitted their Participant Consent Forms and had been scheduled to take part in the interviews, any transcribed information that was typed during the interview was initially codified manually. Prior to conducting interviews, information was organized within categories based on predefined questions (see Appendix D and E) that were prepared in advance. The order of predefined questions that I asked participants helped me with organizing data during the interview and develop additional probing questions based on the participant responses. From the questions, I was also able to identify major themes and subthemes that were discovered from responses, and from this point I was also able to determine whether I had enough data to move onto the next phase of research or whether I would need to conduct more interviews.

It was apparent from the initial findings and analysis, that there were many themes and responses that I had felt begun to repeat themselves and as a result data had become saturated. Though in hindsight more aggregate data specifically from employers would have been ideal, the practical implications of the research and my subjective understanding of determining specifics to answer the research questions was enough to move forward with the study. Essentially, it was at this point I realized that there was no need to conduct additional interviews but rather there was a higher priority and need to further analyze and

makes sense of the information already collected. It was also at this point of the research when I realized I would need to conduct additional research for the purposes of implementing a digital tool such as NVivo© that could support me with coding and categorizing my data in a much more efficient way (see Appendix I and Appendix J).

The NVivo© software not only seemed to match my needs, it was relatively easy to learn in a short period of time, and it was financially feasible to purchase a subscription for the duration of the study. Lastly, and most importantly, NVivo© also provided me with a practical way to prepare for the next phase in my research which was the focus group discussion (see Appendix K), thereby speeding up the data collection process of my study.

Prior to the implementation of NVivo©, I initially spent time coding data manually by printing out transcribed interviews and then placing numbers next to each line of text that demonstrated potential related themes that were organized by prepared questions. Each number was related to a concept or theme, while any additional probing questions that were prompted during different interviews were categorized as subthemes with a different code or indicator. During this manual process, I quickly realized that if I was going to prepare for the focus group, I could translate my manual coding into NVivo© to better inform how focus groups would be led.

4.7.2 Coding and categorizing data collected from the focus group.

From initial findings in the first phase of data collection through semi-structured interviews, I was able to pull specific findings in relation to success in academic and workplace settings. There were 9 major soft skills that I had categorized based on qualitative analysis and literature. From these soft skills, I was able to create a survey ranking tool (see Appendix F) that was presented to the participants. Focus group participants were asked to fill in their personal ranking of each soft skill they deemed to be the most important to least

important. As responses were taken up, the participants were then asked to explain their reasoning behind their top 3 choices, which was compared to the top 3 choices of students and employers that was later revealed to the group. As the discussion continued, data was further explored through predefined questions (see Appendix G) along with additional probing questions based on individual and group responses. Upon the completion of the focus group discussion, all qualitative information was further parsed, and additional themes and categories were identified using NVivo© (see Appendix I, Appendix J, and Appendix K) to be explored in more detail and used for further analysis.

With respect to the survey data, in order to determine the most common and highest ranked soft skill as determined by staff, data was entered in a Microsoft Excel spreadsheet. Once data was entered, a frequency analysis was conducted to identify the total frequency and ranking of the soft skills as indicated by the staff within the focus group.

4.7.3 Research Chronology.

The timeline and process of data collection began with emailing potential students and employers with the Participant Information Sheet and Consent Forms (see Appendix A Appendix B). During this process, I would wait up to 48 hours before sending a follow-up email if I did not hear back from a potential candidate. If there was any potential participant that didn't respond after this time I would move on in the interest of time. I ensured I set up interviews with students first. The validation of documentation, scheduling, and interview process for students took a month to complete.

After completing interviews with students, I then began the same process for employers which took two months to complete due to complications surrounding scheduling and gaining consent from individuals. As data was collected from employers, I

began manually codifying and analyzing information from these results as well. During this time I then realized that this process could be made easier by adopting a piece of software to do some of the coding work and thus it took another few weeks to research, purchase and implement the use of NVivo© to organize and automate some of the qualitative information before I decided to conduct focus groups with staff. It then took another month to analyze and learn how to use the NVivo© software effectively, and to import information from both student (see Appendix I) and employer (see Appendix J) perspectives, and then analyze this information in order to formulate questions for staff in the focus groups (see Appendix G).

With respect to staff participants, though it only took a few days to gain consent from staff members to sign the Participant Information Sheet and Consent Forms (see Appendix C), it took about another three weeks to reserve a common time and agreed upon private meeting spot for staff to attend outside of work hours where everyone would be able to attend. Thus, after original data was collected from students and employers and then analyzed it was about another month before I could conduct the focus group itself. However, after completing the focus group session, I was quickly able to import information into NVivo© for further analysis (see Appendix K) due to my increased familiarity with the software. Overall, the entire process for conducting semi-structured interviews, ongoing data analysis, and focus group discussion took approximately six months to organize, manage, process and collect data for the purpose of this research study.

4.8 Ethical Considerations

Though I did not anticipate any ethical issues during the research, I ensured that all participants involved, prior to agreeing to take part in the study, were informed of the

purpose of the study through a Participant Information Sheet and Consent Form (see Appendix A and Appendix B). Within the form it states that all data gathered would be anonymized, pseudonyms would be used to replace names and organizations, and all confidentiality would remain such that no participants, companies or organizations that they are involved with during the study would be identifiable. Furthermore, I assured participants that I had received authorization from my place of work to contact participants that are familiar with my professional context and relation to the organization.

The additional ethical considerations during the study concern my personal and professional involvement as the Senior Education Manager within the non-profit IT and job skills training program. These were significant when selecting staff to participate within the study. Precautions were made to ensure that none of the members of the organization involved directly reported to me to avoid influence and bias as stated in the Participant Information Sheet and Consent Form (see Appendix C). Furthermore, my role as a manager also did not hold any influence on process changes or personnel decisions within the organization which I believe also supported staff in being open and honest during the discussion.

All participants were individually recruited through email using a personal message explaining my research and both the Participant Information Sheet and Consent forms were attached for their review and reference. Prior to interviewing any participants, I had made sure that all forms returned to me via email were signed and initialed. After receiving the signed forms, they were converted to non-editable PDF's individually password protected and stored on a secure password protected hard drive that is locked in a filing cabinet which only I have access to. I then emailed each participant to suggest times and dates to meet

with each individual either over the phone, in-person, or over video chat using Google, Skype or other platforms as preferred by the participant. For interviews and focus group discussions done in person, they were conducted in non-disclosed locations which only I and the person being interviewed had access to. For interviews done over the phone or over video chat, I ensured that I was in a secure area, and was assured by participants that they were also in a secure area before beginning the interview. All interviews both individual and in focus groups were transcribed and typed using a word processing software such as Microsoft Word. Lastly, to organize the interview schedule, I kept record of any times and dates that I was meeting individuals on a Google spreadsheet, and once interviews were completed for all participants, I permanently deleted the Google Sheet I used to further ensure privacy and confidentiality.

In addition to the methods and precautions stated above, in order to mitigate any factors or possibility of bias within the study and particularly during the semi-structured interviews, I ensured that during one-on-one semi-structured interviews I was sure to listen without responding to answers with any of my opinions on the subject but rather asking participants to expand on a particularly interesting point that they made whether it was for or against my personal views. Additionally, I made sure to employ this same technique during the focus group discussion such that there were times I would have to catch myself as a moderator from agreeing or disagreeing with a particular viewpoint of one of the participants in both my tone and body language. Lastly, I believe the questions that I developed (see Appendix D, Appendix E, and Appendix G) not only helped in supporting the flow of the interviews and focus group discussion but were also designed to be open-ended and asked in a neutral fashion so as not to impart any personal bias on a particular topic or subject.

4.9 Summary

This chapter demonstrated the implementation, importance, and rationalization of qualitative approaches to research through specific ontological, epistemological, and phenomenological frameworks. From these frameworks, ethical considerations were examined as well as why which specific and data collection methods such as semi-structured interviews and the implementation of focus groups were utilized throughout the study. Details on the types of participants were also looked at which provided additional context to the rationale of why specific methodologies were utilized over others. In the next chapter, there will be a detailed examination of the types of conclusions that are to be made through this qualitative approach and methods used. Additionally, a deeper look at what the data has revealed about the perceptions of success factors from varying perspectives of the participants involved in the study.

CHAPTER 5 DISCUSSION OF FINDINGS

5.1 Introduction

This chapter will be focused mainly on the perceptions of success as defined by varying stakeholders including students, employers, and staff. Information presented in this chapter will be based on common experiences and themes provided by each group that has been interviewed and will be organized in the same fashion. This chapter will also try to link prior research from literature as determined in Chapter 2, as well as loop back to Chapter 3 in order to establish commonalities between the findings and theoretical foundations from social constructivist and connectivist perspectives discussed earlier. Finally, through the integration of the multiple perspectives and insights explored throughout the chapter, an attempt will be made at answering the proposed research questions presented in earlier chapters.

5.2 Student Perspectives on Success

5.2.1 Student profiles.

From the eight graduates of the program who were interviewed, everyone had demonstrated that they had a diverse range of responsibilities, technical aptitude and skill, as well as varied job descriptions. Each student had demonstrated that the tasks that they were all responsible for were also varied based on their positions in order to sustain their employment status within entry-level IT jobs at their respective companies. Though some students indicated that their job title, for example, Quality Assurance Analyst, may have been the same for a few of the students, the responsibilities varied greatly based on the organization and departments in which they were placed. Thus, there were no two

participants that had any exact matches when describing the roles and responsibilities that they were hired for.

Similarly, the type of companies that students had worked within also ranged in different areas of focus which included consulting firms, IT managed services, financial institutions and digital media related organizations. Each organization where students were employed also varied in size from small, medium, and even large corporate Fortune 500 companies. Though a few of the students that were interviewed worked within the same organization, participants worked in unrelated departments, with differing responsibilities, and within separate locations and branches from each other.

Due to the variation in job descriptions provided, it was also interesting to see that the applied technical skill and knowledge that each student had to demonstrate also varied. For example, three out of the eight individuals indicated that they needed to know how to use Structured Query Language (SQL) to work with databases: however, each student was utilizing this skill for very specific purposes related to unique circumstances and at different capacities based on the scope of the projects they were working on at the time the study was conducted. Thus, the level and depth of knowledge needed for each technical skill to complete tasks on the job also differed among participants.

As stated in Chapter 4, the only initial commonality between these individuals was the specified indicators as described within the participant information list as eligibility requirements for participating in the study. However, other commonalities began to appear when further analyzing qualitative data collected indicating the soft skills needed to perform well on the job. Although similar phrases were used to describe soft skills the precise interpretation and salience of skills varied dependent on an individual's context.

Table 5.2.1-1 List of top soft skills perceived by students to be important to be successful in entry-level roles and work related to IT.

Skills	Number of Students that Indicated Importance of Each Skill	Descriptions of Skills Provided by Students
Communication	6	"Communication is needed to read people and find ways to get results" (S1) "Active listening and compassion is needed to relate to others" (S2) "Communicating effectively both oral and written is needed daily to engage with customers in addition to actively listening to support the needs of the end user" (S4) "Communication is needed to present new ideas in solving specific issues in software when creating test cases and relaying information between teams" (S5) "Communication is needed to pitch and describe the look and feel of products and services to my manager" (S6) "Communication is 50/50, written and oral to interact with customers and gain a sense of understanding of what they are experiencing" (S8)
Willingness to Learn	6	"There is a lot of emphasis on learning as part of knowledge transfer in my role" (S1) "You need to be a quick learner, be resourceful and research to keep up with all the different programs needed to do my job right, while being okay at not being an expert" (S2) "It's important to show interest and keep learning, and learn new skills while you go" (S3) "You have to want and be willing to learn new things" (S4) "You have to learn skills that apply to your project but other skills that help others in other areas" (S5) "I have learned to demonstrate that I am eager and have the willingness to learn" (S7)
Teamwork/ Collaboration	4	"The ability to collaborate and work with others is important because you often want things to work one way but that doesn't mean everyone would agree with what you are presenting" (S2)

		"It's important to collaborate as my job deals with migrating services from various vendors and business users – we must work together to get things done" (S4) "To be a leader you need to understand how to work within groups and realize some people are drivers while others aren't as assertive" (S5) "You have to be able to be a team-player and work collaboratively" (S7)
Asking for Help	3	"Asking for help is the only way to learn more about how to do your job correctly" (S1) "To show interest in a project you need to ask for help" (S3) "Asking for help is important in supporting what I do in my role" (S7)
Adaptability	3	"Essential roles that I have learned within my job is to be flexible and likeable" (S1) "I have become comfortable with ambiguity in my role that shows that I'm adaptable" (S2) "I've learned to be open-minded and adapt to different situations as needed" (S7)
Problem Solving	3	"Catching dormant bugs in code requires creative ways of solving problems" (S5) "Problem solving is important in ways to implement things that haven't been done before – being innovative and creative in my approach" (S6) "Problem solving is necessary when troubleshooting common user issues and you need to think outside the box if a new problem arises that you haven't seen before" (S8)
Initiative	2	"Taking initiative while learning on the go and asking others for support in understanding how to gain technical knowledge to support my role" (S1) "It's important not to be lazy and take initiative for your work" (S3)
Receiving Feedback	1	"It is important to hear opinions of others to get and receive feedback which shows I understand how to be a team player" (S2)
Time Management	1	"Time management is important in my role as I am required to meet tight deadlines each week" (S3)

Table 5.2.1-1 demonstrates which soft skills are understood by students as necessary to adopt in order to be successful in the workplace. The table summarizes the nine skills most often referred to by students as being necessary to succeed in the workplace as conducted through an analysis from data collected through interviews. The number in the second column represents the number of students of the total eight interviewed that identified one of the nine skills as being perceived as the most important to them to succeed in the workplace. Finally, in the last column are direct quotes from students that were interviewed to demonstrate their personal definitions of each of the specific skills they had identified. Each quote in the last column is cited using pseudonyms S1 through S8 each representing one of the eight students interviewed within the study.

Table 5.2.1-2 below provides a common definition for each of the nine skills based on findings and descriptions provided by participants of the study. Definitions were developed based on responses provided by student participants.

Table 5.2.1-2 List and definition of top soft skills perceived by students to be important to be successful in entry-level roles and work related to IT.

Skill	Definition of Skills
Adaptability	The ability to acclimatize to uncertain conditions and work within ambiguous circumstances without reacting negatively.
Asking for Help	The ability to advocate the need for support when faced with challenges.
Communication	The ability to interact orally, in written format, and through active listening to relay and consume information to or from another person in a clear and concise manner.
Initiative	The ability to take on new roles and opportunities without the need to be prompted or provided guidance from external sources.
Problem Solving	The ability to provide solutions to challenges and scenarios that require deeper reflective thought than most other situations.
Receiving Feedback	The ability to take constructive guidance and implement recommendations provided by external sources.
Teamwork/Collaboration	The ability to share ideas between a group of individuals to develop solutions in order to overcome challenges.
Time Management	The ability to handle several competing priorities within specific set periods and intervals of time.
Willingness to Learn	The ability to process and develop knowledge from multiple resources and mediums that support progression in both personal and professional contexts.

From a social constructivist perspective, it comes as no surprise that communication, having a willingness to learn, and teamwork/collaboration are the most frequently mentioned soft skills among student participants. These findings establish a direct connection with Vygotsky's socio-cultural theory (Kanselaar, 2002). A key component for student success within the workplace is the social interaction between a mentor or more capable peers as discussed in Chapter 3. Thus, as can be seen in the descriptions provided by the majority of the students, there is a clear overlap between the first three skills listed, and it can be inferred that the majority of their learning is developed through social interactions with other people such as managers, team members, internal enterprise users

such as business units and vendors, and external customers students are responsible for supporting.

One statement that stood out from the rest is when one of the student participants specified that you must "[be] okay at not being an expert in order to learn different programs, resourceful and research to learn quickly" (S2). This statement demonstrates that not only does this individual rely on others as being subject matter experts and can ask for help when needed but also seeks support through other means which constructs an ideal way to get better at their job through the willingness to learn by communicating and collaborating with others.

However, though social constructivism provides and explanation for the importance of varying interactions to learning in the workplace, the second part of learning is actualized when individuals are provided with feedback about their progress and they can then apply what they have learned within their respective environments. Formal feedback provides scaffolding opportunities for student participants to grow skillsets to be implemented within their everyday work (Kramer-Simpson, 2018). When students were asked how they knew they were successful on the job, one student stated that "feedback is constant" (S1), while two other students stated that aside from semi-annual reviews that they "engage and ask for feedback" (S4) from their managers and supervisors, and "ask for feedback and reach out to leadership" (S7).

Overall, data collected through interviews shows that all eight students stated that they receive some form of consistent and constant feedback whether from customers, team members and/or managers. Feedback that was distributed to participants was based on both quantitative measures and qualitative anecdotal evidence delivered to them through

online portals, "monthly meetings" (S1), team meetings, interactions with team members in "daily huddles" (S3), formal performance reviews, one-on-one meetings with various leaders within the organization, customer surveys, and daily reports. Additionally, one students stated they "ask for feedback all the time" (S2), and that despite all the varied forms of feedback that they receive, six of eight students indicated they still asked for additional feedback from their managers out of their own interests to gauge a sense of how they are meeting or exceeding expectations of the department as well as meeting their personal goals.

What is interesting is that these narratives on feedback are in direct contradiction to the list of soft skills indicated in the table above that are needed in order to be successful in the workplace. As can be seen only one individual of the eight had indicated receiving feedback as an important skill to acquire when reflecting on skills that support individual success. However, asking for feedback rather than receiving feedback can be potentially placed under the umbrella of both the communication and asking for help, and thereby still considered a valuable skill to maintain.

Additionally, when student participants were asked how they knew they were doing well on the job and how they measured their own success, there were clear themes that emerged. As stated in Chapter 2, career success is categorized into two main subclasses – objective and subjective success. When asked whether salary is an important factor as an indication of personal success, five students stated:

"Being a part of a team or project is more important than salary" (S1),

"Salary is not important, quality is, regardless of the amount of tasks you have" (S3),

"Salary is not important but good work is valued, and salary increases as a result" (S4),

"Quality of a product is more important than salary" (S5),

"What you are doing is more important than money, enjoying what you are doing and who you are working with" (S7), and

"Salary is not as important as supporting someone and making someone's life easier" (S8).

Thereby it can be inferred that salary is not as important as working with others, delivering a product or service that provides value to the customer or supports their own personal subjective growth within their career.

Two other students stated that objective and subjective success is equally important to them. One student stated that there is "equal importance, salary is important to sustain myself, but [you] have to also enjoy the work you're doing…if money is high but you don't like what you do, it's not worth it" (S6). Therefore, being rewarded based on progression in a fiscal form also increases feelings of accomplishment and individual success.

Another student indicated that salary and the type of work they produce are equally important to success as perceived by others outside of themselves by stating, "I'm in the early [stages] of my career, I have a lot to learn, fulfillment in the job requires a lot of emotional labour, and salary is important but so is having meaning at work by directly helping someone and contributing to society…it's not about the final output but the environment and support that contributes to success" (S2). Thus, it can be implied that this individual understands that salary is an indicator of success but subjectively they will have a greater chance success of contributing to their community through supports they are receiving on the job such as increase in pay but also emotional support they receive on the job.

5.2.2 Student perceptions of academic success and life-long learning.

Overall, what can be summarized thus far is that most of my respondents who have experience within entry-level IT positions indicated that personal and subjective experiences are more valued in their opinion than objective measures of success such as salary. In this section, other objective measures such as academic success will be explored to determine whether they have any correlation with career success factors identified above.

In reference to Table 5.2.1-1, willingness to learn was as equally as important as communication skills to most of the student participants. From the individuals interviewed, seven students of eight had indicated that they did not have a higher education degree, while the other individual stated that though they had completed a higher education degree it was unrelated to IT. Of the seven without higher education degrees, four had experienced higher education in fields unrelated to IT but were unable to complete degrees due to varying circumstances, while three of the seven had completed high school without any subsequent higher education experiences. Thus, when students were asked whether they saw a direct correlation between having a higher education degree and the increased chance of obtaining successful employment opportunities the results varied.

The first theme that was identified was in relation to the importance of higher education with respect to their current employment experiences. There was a clear split between participants which established two streams of thought and thereby placed them into two distinct groups. Those identified to be placed within the first group felt that overall, higher education degrees are not important with respect to growth or to determine success. This was apparent when some students stated "higher education wouldn't be helpful on the day to day but if you don't have it you get paid less" (S1), "higher education in my role is not

important but it is important in other positions" (S5), "higher education is not relevant to the work I do" (S6), "I haven't noticed a stigma between varying levels of education at my workplace" (S8).

In contrast those categorized into the second group felt that higher education was important to growth within their respective industries stating "95% of the time there is a stigma of those that have a degree vs. those that don't" (S2), "higher education would support my role as there is some value among peers" (S4), "there is judgement from employers not having higher education" (S7). However, like the first group, the second group also felt that not having higher education did align with their personal definitions of success. This was apparent when some of the students from both groups stated, "experience and working well with others on the job is more valuable…[though] there is credibility to higher education but it's a nice to have" (S4) and "experience outweighs credentials, depending on what type of environment you are in" (S8).

As can be seen some of the participants in the first group expressed the belief that, depending on the roles (such as leadership roles) and areas they would like to move in, they would be at a better competitive advantage if they had both experience and credentials to showcase their commitment to learning and thereby to supporting the organization in which they were employed.

Furthermore, students in the first group had also indicated that they had been informally learning a wide array of technical skills since graduating from the program, and that they were either self-taught or had adopted these skills through learning on the job. They believed that these skills would be valuable with respect to success outcomes within their roles and toward long-term career growth.

Thus, overall, higher education is seen to this group as valuable while at the same time not necessary but also important if they are wanting to progressively move up the corporate ladder within their industry.

The perspective from the second group of participants with regards to higher education was that having a higher education degree would support their role as well as being valued among peers and the organization where they are employed. Additionally, participants stated that depending on which roles they would like to pursue in the future, such as senior management, there is credibility in demonstrating that one had earned a degree. Within the second group, two of the three participants believed that having a higher education degree supports success in their employment.

They also stated that having a degree helps get through recruitment and HR process. These departments according to the students in this group act like gatekeepers to potential opportunities. In other words, if these individuals were to be let go of their jobs, they would have to justify the experiences they had gained but would still need to pass through the application process both within their place of work and within other companies. This is understandable, as many candidates applying for work are not only screened for skills that match a job description but also are likely to be selected based on the credentials they possess.

Both groups indicated the necessity to upskill themselves, whether it would be through traditional higher education or non-traditional training programs, to develop portfolios or to earn online degrees or further technical certifications specific to their interests and current jobs. Thus, the second theme that emerged within the interviews is the value of differing credentialing systems from the perspective of the organizations they

work in. In this case there were three specific findings that were evident based on their different values and conceptions of traditional versus non-traditional education and programs.

The first finding was made up of individuals who favoured non-traditional education and preferred alternative methods of learning over traditional higher education systems. The second finding indicated that there are individuals that thought traditional education systems would hold more value than non-traditional education, and the third finding consisted of individuals that had a neutral stance and could see benefits and drawbacks for pursuing each form of education.

Within the first finding, there were four participants who felt non-traditional training programs have supported them in obtaining employment. All four individuals indicated that though they could see that there is a societal value in pursuing higher education they were using online courses to supplement their learning and enhance skillsets specific to their roles. This was apparent in comments like, "online courses and specialized certifications are a great way to polish your skills" (S4) and "[non-traditional] training programs provide better opportunity to build technical skill and other skills such as business communication and presentations" (S8). All four individuals also thought that non-traditional formats offered them a much more focused approach to developing both technical and soft skills that have supported and continue to support them in their personal growth and navigation within the workplace, "you wouldn't get the same experiences in [traditional] schooling, there is more collaboration and focus in non-traditional programs" (S7).

There was one participant however who signified that higher education is an important facet of moving forward within the workplace stating they "would have a good

chance of getting jobs moving forward if [they] presented a degree but with a good portfolio" (S2). This individual also expressed the view that "the type of [university] also matters, such as IVY league" (S2) explaining that a branded school known for prestige within an area of focus is also a factor in obtaining successful employment opportunities. However, this individual also stated that though you can prove your skill base within the organization, "the door is not always open" (S2) especially if the people that you are competing with have credentials from the schools mentioned above, and "if you make it to the interview, depending on the person who is interviewing you, you may make the cut" (S2).

Overall, the biggest critique from this individual was that there is a stigma within the organization that comes along with not having a higher education degree, and if you have a degree the type matters. However, internally when working on the job this is not the case, and there is still a place for employees to provide their best work and be considered a part of the team regardless of their current academic background.

The final group consisted of three participants. This group had a neutral stance on education and felt that all forms of program whether non-traditional, online or traditional brick and mortar higher education are all valuable. Of the three participants, two of them stated that they would like to pursue higher education in fields outside of the IT industry after a few years in their career journey. But they also indicated that they would also like to continue to pursue further certifications to keep up with technical demands as they enjoy working within the IT industry.

All three individuals also stated that though there is a value in pursuing further education in non-traditional settings such as online learning, there is a missing component that they all experienced in comparison with non-traditional programs that are conducted in

face-to-face environments. This is the emphasis on soft skills such as business communication, working within teams, and learning how to learn. This group also indicated that though higher education will help those who wish to pursue expertise in specific domains that require specialized skillsets, such as social workers, teachers and doctors, other higher education programs lack the curriculum for improving soft skills that are applicable to the workplace. Interestingly, this group consisted of the most varied combination of academic experiences among participants which included a high school-only graduate, an individual with partial higher education experience, and an individual who had completed a higher education degree in a field that was unrelated to IT.

5.2.3 Student definitions of success.

As determined from the previous sections, the common themes that indicate student success within the workplace have been largely based on subjective experiences of the participants. In this section, there will be an attempt at determining whether there is a common understanding or definition of success from participants involved in the study.

Some common key concepts that were described by students that related to their personal definition of success included money, learning, career growth and avoiding stagnation. In relation to the first theme with respect to money, some responses from student participants included "[earn] enough money to feel secure" (S2), "doing something that brings value to the company, and earning money" (S4) and "enjoying what you are doing but making money to cover your living" (S8). Overall, all eight student participants stated that though financial gains for work are important, it does not define their personal measures of success.

Furthermore, when students were asked to identify individuals whom they perceived as successful, the outcomes were more aligned with subjective aspects of success and in contradiction with what they personally deemed as being objectively successful. Of the attributes they listed, there was no mention of the amount of money someone obtained but rather statements such as "someone who is a [manager] that has emotional intelligence…and leads by example" (S2), "knowledgeable in all different subject areas and not just IT" (S4), "someone who is genuine, honest and looks out for others" (S5), "someone who [cares] about and is passionate about what they do" (S6), "[someone] who engages with people…and pushes people to success…who started from the front-line and worked [their] way up" (S7) and "people who enjoy their work and like to help people…[and] being confident in knowing what they are doing [by] reassuring clients that they can get the job done" (S8).

From these responses, then, it is important that leaders within an organization have skills that indicate self-awareness and self-efficacy which seem to align to Bandura's (1977) attributes based on the four conditions as explained in Chapter 2. As can be seen each response has demonstrated that leaders should possess at least one of the four attributes related to self-efficacy such as performance accomplishments, vicarious experiences, verbal persuasion, and/or emotional arousal.

In relation to the second theme surrounding learning, many of the participants indicated that if they were constantly learning so that they were not stuck, this would support them in their feeling of growing both personally and professionally, and therefore of remaining in a state of upward flow with regards to their subjective success. A few of the participants also stated that overcoming challenges and solving problems showcased that

they were successful. It seems that through these responses there were intrinsic motivational factors for wanting to continue to work and thrive in their respective jobs. However, many of the students also indicated that they would account achievable outcomes such as promotions or increased responsibility as an independent measure of success. From these responses we see that there is another overlap between objective and subjective notions of success.

Overall, based on identified themes throughout the student interviews, there is a clear indication that obtaining knowledge and learning to grow as subjective aspects of success are perceived to support objective successes such as increased salaries and promotions or increased responsibilities within their jobs. However, it is also clear that society often stigmatizes a lack of credentials or has an influence on the measure of quality and the type of skills that are important to learn to be successful on the job.

From a connectivist perspective, the implementation of varying social and learning technology platforms has flooded the gate with respect to learning new skillsets. Thus, it is no longer important where you learn but rather that you are learning in a continuous and dynamic manner and applying what you have learned to the circumstances that you are facing. If students are indicating that it is important to learn to stay relevant and grow within their careers, it is vital that employers also see that in a connectivist society workplace learning can be managed. According to Siemens (2005) organizations have the capacity and ability to foster and nurture a flow of knowledge that not only fulfils the learning motivations of its employers but also encourages rapid implementations based on learning opportunities to produce increased outcomes for the benefit of the organization itself.

Additionally, it could be deduced that those organizations that encourage and adopt continuous learning strategies for life-long learning through systems of networks and place less emphasis on credentialism or qualifications would then in theory be able to spend more time focusing on the development of personal and professional skills for their students in varying forms of education and even in-house training for their employees. However, whether this is feasible or whether employers and staff agree with the students' perceptions will be discussed in the next few sections, first from the perspective of employers and then staff.

5.3 Employer Perspectives on Success

5.3.1 Employer profiles.

At the time the study was conducted, of the six employers that were interviewed, all participants had been involved in lead management roles. All participants had also had experience with hiring, mentoring and/or recruiting young talent to fill IT-related roles that would meet the needs of the company. Like the student profiles explained earlier, the type of organizations in which participants were employed included small, medium and large corporations. Participants had various job titles and no two participants worked within the same organization. As a result, all job titles described were varied.

Additionally, there were no two roles between participants that had overlapping responsibilities, as all required a specific set of skills independently described by each participant interviewed. Thus, a diverse range of participants with varying years of experience in diverse roles were selected to determine differing and contrasting

perspectives of student success in workplace settings. Finally, all employer participants had had direct experience with working with one of the graduates from the non-profit program.

Similarly, when asked to describe the most important technical skills required for students to learn in order to be successful in their roles within the respective companies in which they worked, there was a wide variety of indications such as working with specific operating systems, understanding network architecture, working with various software applications, coding in specific programming languages and many others.

When analyzing commonalities between employer participants, like the student responses, when asked to describe the type of soft skills required for students to be successful on the job there were many responses that were consistent with one another. Table 5.3.1-1 demonstrates which soft skills were described by employers as necessary for students to enhance and continue to work on in order to be successful in the workplace. Like the student table presented earlier, Table 5.3.1-1 summarizes the nine skills most often referred to by employers as being necessary for students working in entry-level roles to succeed in the workplace. The number in the second column represents the number of employers of the total six interviewed that identified one of the nine skills as being perceived as the most important to them for students to succeed in the workplace. Finally, in the last column are direct quotes from employers that were interviewed to demonstrate their personal definitions of each of the specific skills they had identified. Each quote in the last column is cited using pseudonyms E1 through E6 each representing one of the six employers interviewed within the study.

Table 5.3.1-1 List of top soft skills perceived by employers to be important for students to have in order to be successful in entry-level roles and work related to IT.

Skills	Number of Employers that Indicated Importance of Each Skill	Descriptions of Skills Provided by Employers
Communication	5	"Ability to listen, speak, and write through various mediums such as phone, online chat, and social media to empathize and understand the needs of the customer" (E1) "Communicate to understand the varying needs of different people – interacting with strangers" (E2) "Listening and speaking to understand and make sense of day to day issues, even when you're not customer facing, being able to articulate where you are coming from is important" (E3) "Communication skills are important when dealing with senior staff" (E5) "Need to be good at building networks and meeting people and speaking with them to make connections" (E6)
Teamwork/ Collaboration	4	"The ability to work with others to support you in covering shifts or even when seeking a solution to a problem" (E1) "Healthy competition supports collaboration between peers" (E2) "Must show evidence of leadership and drive to lead teams" (E5) "Youth should be engaged with their team and beyond their immediate department" (E6)
Willingness to Learn	4	"Being able to learn something new" (E1) "Curiosity is key, learn from mistakes – welcome mistakes, be willing to learn" (E4) "Academic success plays an important role within the company" (E5) "Being a curious and proactive learner, you don't need to know everything, but you can use resources to find out what you need to know" (E6)
Asking for Help	3	"Not being afraid to say they don't know and that they need support" (E1) "Ask for help and knowing that someone else is always smarter than you" (E2) "Asking for help to look for opportunities in order to grow" (E6)

Adaptability	3	"Be well-liked within the team and support those around you when they need it" (E1) "Finding balance between being extroverted and introverted based on situations – positively react to being coached" (E2) "Should be compatible and friendly to work with and have a sense of humor" (E3)
Problem Solving	3	"Solving a problem at the first attempt" (E1) "There is no manual that is mapped out for day to day issues, you must be able to improvise, move away from a prescribed day and problem solve" (E3) "Problem solving is the number one attribute we look for in a candidate, specifically, how they utilize skills from past experiences to show case their way of problem-solving" (E5)
Initiative	2	"Take initiative to cover other people's tasks and support in side-projects even when not asked to do so" (E1) "Be proactive and look for work when they have completed their own tasks" (E6)
Receiving Feedback	1	"The ability to be critiqued is important" (E2)
Time Management	1	"Time management is an important skill to complete day to day tasks" (E4)

As can be determined by the table, when employers were asked to identify what skills they felt were important for young individuals entering the IT industry, the most fascinating finding in the data listed above is that the nine top skills identified by employers exactly matched with what the student participants also stated in their interviews. Furthermore, the bottom six skills listed - asking for help, adaptability, problem solving, initiative, receiving feedback and time management – have similar degrees of importance ascribed to them by both students and employers.

With respect to communication as a skill, the statements provided by both students and employers are similar in their inferred meanings and descriptions of why specific skillsets are more important to cultivate than others. For example, many students and employers emphasized supporting others and providing value to customers which was apparent in statements like "written communication helps with encountering customers feelings" (S8) and "communication the ability to listen [and use] oral and written skills is important [for] customer service – to empathize and understand [client] needs" (E1). However, descriptions for teamwork/collaboration and the willingness to learn provided by employers had different connotations than what students had revealed within their interviews.

For teamwork/collaboration, many students spoke about this soft skill from personal viewpoints whereby for them to collaborate with others showed that they were demonstrating camaraderie between teammates to solve problems or exhibiting signs of enculturation towards the norms of the organizations in which they work. For example, one student indicated that there is large "emphasis on teamwork… you have to be versatile to work within various groups and adapt well" (S5). Employers on the other hand describe

teamwork/collaboration as an extension of or going beyond the self, such that it is important to collaborate and work with others for the benefit of the company and organization in order to lead teams toward accomplishing a common purpose or goal. This was apparent in statements from employers such as "teamwork is the ability to work with others so that you can ask questions…cover shifts for each other when operating a 24 hour support desk" (E1) and "you need a winning determination in beating competition, and strategize as a team to execute a plan, increase sales, and engage with the right people" (E2).

As for willingness to learn, both employers and students seemed to have agreed on the importance that the ability to learn has on succeeding on the job in combination with seeking help from others. Individuals from both employer and student groups stated that "you must be willing to accept that you don't know everything" (S2) and know "someone is always smarter than you" (E2) and approach these people and learn what you can do to meet objectives and get tasks done. Additionally, employers not only placed emphasis on the willingness to learn but also stated that students should have "learning agility": not only should they have the willingness and ability to learn but should show that they are "proactive learners" (E6) such that they understand keeping updated with their learning in consistently changing and sometimes unstable environments.

5.3.2 Employer measurements of student success in the workplace.

When employers were asked how they measure the performance and success of their employees and specifically the students who have entered the workplace within entry-level IT roles, there were several approaches indicated but the types of methods fell into either formal or informal measures of success.

Two employers stated that they relied heavily on informal measures and qualitative findings rather than specific quantitative measures. Of these two employers, one stated that though quantitative measures are useful, it is the qualitative information that they value and collect based on informal conversations they have with team members keeping track of "what motivates and demotivates a person" (E2). This approach is very organic and specific to the workplace culture in which this employer works.

The other employer that relied on informal practices for indicating measures of success stated that they do not have a formal process but were working on "finding out ways to quantify and measure" (E4) qualitative and subjective measures related to their employees. Thus, what they currently measure is the informal dialogue they have with the young employee that focuses on what they have learned, whether they feel a "sense of accomplishment" (E4) in their work, and whether they are able to "communicate both challenges and strengths" (E4) they are facing and how they are working on solving these issues. Another employer suggested that they support youth through "employment-driven social enterprises" (E3) such as coaching initiatives that pair up newly hired youth with mentors within the organization, and other training and workshop activities that incorporate room for feedback to take place. Through these initiatives youth can transfer this knowledge and these experiences into their resumes to help support their career growth.

Of the remaining four employers, all of them stated that they used a combination of both formal metrics and informal qualitative measures to determine performance levels of an individual. One stated that it is important that a person beginning their journey within the organization can firstly demonstrate their academic accolades such as having a high GPA

within specialized degrees that would support the organization moving forward in a specific department. Secondly, it is important that these same individuals can also demonstrate within their performance evaluations that they have a long-term career plan that shows progression from entry-level roles into managing a team, and eventually a department. Once individuals are integrated, they are then measured by the continued training and professional development they are participating in which aligns with their career goals.

With respect to the other three employers, they indicated that they utilized an array of quantitative tools such as rubrics, formal performance reviews, sales measures, customer reviews, and online platforms that track time spent on tasks and the number of tickets closed supporting customers – the clients who call-in to the IT helpdesk reporting problems they have with their systems. However, all of them valued the informal and subjective measures that provided qualitative indications of performance more than the formal quantitative metrics. Some examples of informal qualitative measures included how fast an employee could pick up on the software or systems to perform their job, how they interacted with team members, the ability to present information to clients, showcasing creativity by bringing new ideas forward to the team, and hearing what tenured employees had to say in general about the newly hired individuals.

In relation to the last statement, a specific example of informal measures that stood out mentioned by two of the six employers is that managers often used the hours off work, such as during breaks or lunch time, to see how new individuals got along with other members of a team. Managers often observe whether the newly hired staff can converse with people during times when they are not working on a specific task or project but rather just 'hanging out' with other individuals. These employers stated that this is a good indicator

of how well they would be able to work toward common goals and reduce personality conflicts between team members while finding a common ground during high pressure circumstances.

Other themes that were established through the interviews were the concepts of feedback and motivation. Like the student participant responses, "consistent and regular feedback" (E5) is vital to understanding how a newly hired individual can perform better at their job.

Three of the six employees revealed an interesting perspective with respect to motivation. They stated that it was important for managers to seek out what motivates an individual to perform on the job. Often enough, many entry-level IT roles are mundane, and individuals can "quickly outgrow their position" (E1). Thus, in order to maintain job satisfaction, it is important for both employers and employees to determine together what drives them to grow within the company and within their respective careers. This was particularly interesting because, as stated earlier, many students defined their success through the value they provide to others but also that they would continue to feel successful if they were provided with opportunity to enhance their skills and increased responsibility to demonstrate their skills.

Additionally, from all the responses from employers above, another major theme that emerged through measurements of performance and success is the idea of mentorship. Whether measures were informal, formal or a combination of the two, five of the six employers mentioned that coaching, training, or one-on-one mentorship is provided to support newly recruited individuals with their work and progression over a certain period. The one employer who did not mention coaching and training specific to measuring levels of

performance on the job did state they support and provide guidance to young employees who are looking for ways to upskill themselves with respect to education and professional development.

The concept of mentorship and coaching as described above by all the employers aligns well with the social constructivist paradigm. Once again, like the importance of feedback as described by students, the value of mentoring and apprenticeship is well explained by Vygotsky's concept of individuals being supported to move through the levels of ZPD as described in Chapter 3. However, this framework for learning and mentorships is largely adopted within classroom settings and may not always be realistically implemented within workplace settings. Thus, it is more likely that there is availability of an expert to support and guide students, whereas within workplace settings managers and other experts may not always be available to support employees in their learning journey.

Therefore, from a connectivist perspective, employees and especially newly hired youth will have to learn to be resourceful when other nodes of learning are not available. This is where a few of the principles of connectivism developed by Siemens and stated in Chapter 3 can extend the social constructivist perspective. The most relevant principles of connectivism that address this issue are:

- learning is a process of connecting specialized nodes or information sources;

- learning may reside in non-human appliances;

- the process of learning is more critical than the information that is known;

  (Siemens, 2005)

Each of these principles supports the notion that connected learning can be accomplished through social interactions that extend human contact. Newly hired youth and employees should be able to search and be allocated time for finding resources that will support them on the job. These resources are likely to be found in databases and other platforms which they can refer to. Similarly, the final principle stated above acts like a substitute to traditional apprenticeship models, whereby employees can seek support outside their respective organization by finding online communities and forums to support them in problem-solving and engaging in alternative methods of learning to find solutions.

5.3.3 Employer perceptions of student academic success and life-long learning.

The last statement expressed above will be further explored in this section in order to determine whether employers value learning in ubiquitous environments such as non-traditional forms of education or whether traditional forms of education are valued greater. When employers were asked whether they felt higher education had a direct correlation to gaining employment the responses varied based on the context of the organizations in which they worked. However, statements become more common among participants when the question was framed to discuss how they felt about education and credentialism from a personal context.

Firstly, from an organizational perspective, employers state that a higher education degree showcases that students have specific skills applicable to roles they are applying to. Additionally, some employers stated that this also represents an amount of dedication to see something through and from the employers' experiences that individuals with a degree "tend to do better [in their performance] across the board" (E3). In other cases, there were some employers who feel that those with higher education degrees are not always "being

honest with their abilities" (E4) while others value the type of education along with considering the status of the university when hiring a potential candidate. Some of the other employers who were interviewed also expressed the view that "implicit biases should be removed" (E3) and considerations should be made for those individuals that have not attended higher education programs, as they may display a different set of skillsets that stand out from those who have attended prestigious well-known internationally-based schools.

All six employers stated that in their personal opinions they do not necessarily care about whether a candidate, especially one entering the workforce to fill an entry-level role, had a higher education degree from a traditional setting. In fact, some employers stated that they were also "indifferent as to whether a degree had been completed through online means – everything else being equal" (E1) as long as a candidate can adequately "articulate transferable job skills" (E4) earned through other non-traditional programs.

The one employer who disagreed with other employer sentiments stated that they were weary of fully online programs as they might not necessarily provide students with the soft skills and interaction necessary to be transferred into workplace. As a result, skills such as collaboration and working in groups which require face-to-face interaction between peers and colleagues might not be adequately represented. However, this same employer also indicated that non-traditional programs that offer soft skills training within face-to-face settings have been successful in providing quality candidates to work within their organization. Thus, all six employers have indicated finding candidates that are of good fit for the working culture specific to their organizational needs is much more important than the credentials they hold.

Furthermore, four of six employers stated that a large reason why non-traditional and online programs do not provide equal opportunities for candidates who attend these forms of education is that HR and filtering systems disregard any value that these programs might provide. Though different forms of education should be viewed as equally valid an implicit bias still exists. A few of the employers stated that they were working on removing these biases such as type of degrees and names of schools and developing alternative measures that focussed on competencies and actionable scenarios that allow potential candidates to showcase their skills applicable to work.

However, personal viewpoints on education are that most employers do not necessarily care or are indifferent to the type of qualification an individual has earned. The important factor is that young professionals have the willingness and continued stamina to learn to improve skillsets. In fact, one of the employers stated that there are many examples of leaders within the organization that do not hold higher education degrees – but are advocates for continued professional development. Therefore, there is an essential need to change practices within the workplace environment as well as recruitment practices to develop measurements and an openness to consider hiring individuals that have a diverse range of educational backgrounds on par with traditional degrees.

5.3.4 Employers' personal definitions of success.

In a previous section there were contradictory statements with respect to objective and subjective definitions of success among students. In the case of employers, when asked what they identified as a personal definition of success and what attributes they observe in people they deem to be successful, their replies were extremely varied and more related to their personal progressions within their careers than those described by students.

An example of this is when one of the employers stated that "success is someone who takes an active approach to their career as opposed to not…as it easy to do what is expected but [successful people] must do something that is unexpected" (E1). In other words, successful individuals take an active approach toward their career and do not sit comfortably, taking appropriate risks as needed. This same individual also expressed the view that people are successful in their career when they "inspire others to do their work well…are generally liked by everyone…and at the same time do not micro-manage others" (E1).

Along the same lines as the employer above, other employer responses expressed the need for "being fulfilled" (E2) in their career journey through validation of "job title changes" (E5) and recognition of work, while others attributed their own success to "building trusting relationships with others" (E4). Finally, a common theme that emerged among a few of the employers was that those who overcome struggle are considered successful. A few employers shared personal stories of themselves or of others close to them, or stories they had come across that had personally inspired them. All conveyed messages of individuals who have overcome hardships they once faced and how they have beaten the odds. Additionally, a few employers stated along this theme that "success is a subjective journey" (E5) and that failing, learning and eventually "designing your own success" (E5) is what continues to support your growth.

One other notable theme that surfaced during the employer interviews was the connection between success and creativity. Five of the six employers stated that creativity, experimentation, ideation, development, and innovation are all important facets that drive successful outcomes. Some of the employers specified that having the ability to put

together ideas and having an environment that allows you to put a team together to see the vision through is important to produce successful results. A few employers also stated that if there is failure in the process, "it's okay to fail and [it's] okay to learn" (E3), and as a result the creative process cycles back to the beginning. Some employers also stated that if the creative process puts "people first" (E2; E4) and is human-centered in its approach, then the big problems can be solved: knowing that your ideas have an impact and as a result you feel like most days you are making a difference are indicators of success. Lastly, a few of the employers also stated in relation to creativity that having a diversity of thought and thinking inclusively are important, but such an understanding can only be experienced and not taught within any formal education practice.

All the above responses are in direct relation to what students responded when asked to describe attributes and traits of individuals they felt were successful. This could be because all the employers have demonstrated years of experience within the working world and have over time reframed their personal notions of success based on the experiences they have had. Additionally, from the responses provided, all the employers seem to display a high sense of self-awareness and self-efficacy, like the traits of those individuals that students stated as people they look to as models of success.

5.4 Staff Perspectives on Success

5.4.1 Staff profiles.

As stated in Chapter 4, the five staff participants that were involved in the focus group, referred to as FG1 through FG5 moving forward, were selected from various departments having different roles and responsibilities within the organization to ensure a diverse range of perspectives. All staff have worked directly with students from the program

and have been largely involved in supporting youth transition from the program into employment within IT.

In order to initiate the focus group discussion, staff were presented with a survey ranking sheet (See Appendix F) of nine soft skills as identified from the interviews conducted with both students and employers. Staff participants were asked to fill in the ranking from the topmost important to the least important skill they felt that students should possess in order to be successful in the workplace. During the survey some of participants stated that "This is difficult to do, all are so important" (FG1), while others in the room nodded in agreement. However, they were encouraged to determine to rank what they felt was the most important and reassured that there was no "right" answer.

Upon completion of the survey, the staff were told that after analyzing findings from the interviews of past students and employers there had been a consensus between both groups that communication, willingness to learn and teamwork/collaboration had been ranked among the top three of all nine skills represented. Each staff member was then asked to reveal their top three from their ranking. It was clear, at least anecdotally within the discussion, that willingness to learn ranked high among the participants in the focus group as well. It was also noted that teamwork/collaboration was rated much lower within the focus group compared to the students and employers. Table 5.4.1-1 shows the ranking of skills based on the survey data provided by staff. All data was analyzed and prepared post focus group discussion.

Table 5.4.1-1 Top ranking of soft skills perceived by staff to be the most important to least importance for students to be successful in entry-level roles and work related to IT.

Skill	Total Frequency	Rank
Communication	34	1
Willingness to Learn	34	1
Problem Solving	31	3
Adaptability	30	4
Initiative	25	5
Asking for Help	22	6
Time Management	19	7
Teamwork/Collaboration	17	8
Receiving Feedback	13	9

The most remarkable finding is that communication skills ranked the topmost important skill for staff as well as students and employers. However, this wasn't immediately apparent during the focus group discussion as three of five staff demonstrated a strong affinity toward answering willingness to learn as their number one selection for students to possess to lead to successful outcomes in employment. As a result, many questions posed during the focus group discussion were based on why having a willingness to learn was considered a top skill among all three groups, as well as additional questions surrounding different perspectives on teaching and learning in varying educational settings and within the curriculum, and the implications of measurements of academic outcomes relating to student success compared to staff perceptions of success.

When staff were asked to explain why willingness to learn was one of the most common themes for all three groups, the reasons varied. One of the staff participants indicated that having a will to learn is like "having that internal drive and want to learn,

however, it should be considered that not all individuals know how to learn" (FG1). Another staff participant stated that "If you aren't willing to learn you can't do a job, you can have a lot of experience but if you aren't willing to learn – it doesn't work out" (FG3). From the employment perspective other participants stated that young people that are entering the workforce, especially at the beginning of their career, "expect a mentor to guide them" (FG2) are often provided support and perhaps "more willing to keep up with the learning in order to show that they can sustain themselves in their job" (FG2).

Other explanations included insights that all other skills listed on the survey were more open to interpretation and not easily measurable while the concept of learning seemed to stand out: it could be easily measured both quantitively and qualitatively, such as learning new technology to do day-to-day tasks or being self-aware that learning has to be done to do well on the job or even earning certifications related to the work they are responsible for knowing how to do.

5.4.2 Staff perceptions of student academic success and life-long learning.

As identified by many students and employers, there were a wide array of differing views regarding perceptions of academic success in varying forms of education as seen within non-traditional programs, online, and traditional programs. However, a commonality among all participants was that face-to-face programs are believed to provide greater value, specifically, in learning of soft skills that are vital to being successful in the workplace. Thus, staff were asked to provide their personal preferences on varying forms of education and whether they could indicate any correlations between the type of schooling and the influence of education toward obtaining soft skills to support workplace success.

With respect to traditional higher education, there were many views that aligned with what both employers and students said. For example, some of the staff indicated that going to university "right after high school, it's what you do" (FG1) and "the way it [was] messaged is that you have to go to university after high school" (FG5), and there wasn't any thought placed into selecting a specific major or specialized focus "you chose what you wanted to learn in school rather than what was sought by employers" (FG3). Some staff indicated that, depending on the industry, if there is a niche skillset "such as being a doctor or computer programmer, time within university is generally managed" (FG2) and as a result, students are focused on a specific career trajectory and thereby "learning the skills by attending specialized programs" (FG2). As a by-product in these special cases the student is obtaining technical and soft skills to showcase dedication to completing a degree expecting a specific outcome or result such as obtaining employment within the field. However, some staff further indicated that though the "university experience was supposed to prepare them for the working world [it] didn't… [and they] came out of university not feeling that they would have the skills that corporate environment [expects]" (FG4). Thus, the type of degrees one earns does not equate to successful outcomes and then translate to obtaining employment. Some staff also indicated reservations about the value in credentials, specifically in the name and credibility of the institution: "there is value in the name of an institution [which provides] credibility, time-management and motivation to complete school but…this alone does not necessarily prepare an individual for the job" (FG3).

Overall, staff seemed to have agreed that though the level of education may vary between students, many participants enrolled in non-traditional programs begin with a

similar level of soft skills. Additionally, some staff indicated that whether forms of education are traditional brick and mortar institutions or non-traditional such as fully online programs or training programs such as the one in which they currently work, so long as there are practical components that emphasize active learning, mentorship, and opportunities to practise soft skills in real-time, then success for individuals entering the workplace is not far behind.

Based on these responses, staff were then asked whether they felt that non-traditional programs such as where they work have adequately prepared students with the soft skills necessary to be successful in the workplace. All staff participants agreed that the curriculum of the program is set up to ensure successful outcomes for the participants in the workplace. This is apparent through consistent "feedback [that] students are able to implement in a positive way" (FG1), and when students "have fulfilled deliverables at [on the job]" (FG2) based on what they have learned in the program. Other staff members stated that "we take time to better support students if we feel they aren't doing well…providing opportunities to fail" (FG3) and then correct their learning, and increased accountability using "a lot of positive reinforcement" (FG5) to complete tasks through workplace simulation and positive reinforcement strategies.

However, a common theme among all staff was what happens after students successfully complete the program. Once the level of support provided to students during the program is no longer accessible, students are expected to adapt to new expectations, responsibilities and varying levels of accountability in their transition to the workplace. Staff indicated that students "lose magic when sending them into the real world" (FG2) and "students are in a bubble – when going from academic settings to career settings, there are

supports in place but there is [less] accountability placed on them after completing class"
(FG4). These apprehensions revealed by staff explain why problem-solving and adaptability
were ranked much higher by staff than by both students and employers. It would make
sense that students need to learn how to apply what they have learned through the
program and then utilize these skills to solve new problems they may face within workplace
settings. Thus, there needs to be greater emphasis on simulating work environments in
classroom settings to support successful student transitions into the workplace. Although
staff believed that they have been good at providing additional supports for students
beyond the duration of program, they thought that improvements could still be made to
formalize and provide resources to increase these supports once individuals have
successfully completed the program.

5.4.3 Staff measurements of student success.

Though staff determined that they could improve in providing supports once the
students have completed the program, staff were also asked how they equate
measurements of success while students are still a part of the program to likely measures in
the workplace. A common theme that appeared within the focus group discussion is the
notion of both quantitative and qualitative evaluation data. Quantitatively, it is easy to
assess how many students have earned technical certifications relating to the program but
also to quantify the number of students that successfully find sustained employment within
the IT industry. However, from the qualitative informal observations, there are specific
patterns that emerged from the focus group discussion that were varied. One staff member
stated that "it's numbers and people, the more people you can lead to confidence the more
people will get jobs and be successful – confidence is key" (FG2). Other staff remarked on

the growth of individuals, stating, "if someone comes [into the program] and then grows towards betterment as a professional...with respect to implementation of feedback provided to them" (FG3) this is how we know our students are successful. And another staff member proposed "students leaving the program more confident about their future, gaining skills regardless of the outcome, and reaching out to [us] when seeking work" (FG4) and "when students get knocked down [by not passing an interview or certification] but get back up [showing]...adversity and grit" (FG5). Finally, one staff member summed everything up by stating that success is measured in "small ways...watching [students] push themselves to do things that are difficult...[though] the ultimate goal is to get a job but seeing them getting to the next step such as an interview is also success" (FG1). Thus, from the tone of the discussion and responses provided, it seemed that the qualitative measures of individuals provided more insight into success rather than just the quantitative though these are also considered valuable.

The perspective of using qualitative measures rather than only quantitative measures is like the view's employers expressed when measuring success of employees in the workplace. Although qualitative factors cannot necessarily be measured with ease, there is great benefit in tracking these indicators to determine the levels of increased potential for success when in transition from academic to career settings. Thus, it can be presumed that if anecdotal observations are being recorded and tracked along with focused training on improving soft skills, that is a major benefit of non-traditional programs: traditional higher education programs do not necessarily provide this benefit to their students.

5.4.4 Staff definitions of success.

When asking staff to define what success meant for them personally, there were two themes that emerged throughout the discussion. One theme looked at success as a constant state of growth, while another theme among staff attributed success to counting the small wins and goals that have been accomplished each day. Of the five participants, three staff had similar views of success relating to the first theme identified. Success as defined by one of the participants included the ways you grow and contribute to something that is meaningful, while "consciously reflecting on who I am today, and thinking about how I can be better tomorrow or the next week…[whether] I have contributed to something meaningful" (FG1). Another participant stated that you can "never [truly] be successful, it's growth, you should never be content and always look forward" (FG3). While another staff participant stated "grit, truly believe that is what success looks like for me, there are days when you want to give up, any measure of growth" (FG5).

The other two staff had similar responses to each other with regards to success, and these included "meeting deliverables at work to help others gain what they need" (FG2) and "proud of accomplishing something everyday, feeling accomplished at what you've done everyday" (FG4).

All the responses provided by staff seemed to provide a very different perspective and definitions of success than the majority of those provided by employers and staff. The reason for this could be in direct relation to encounters they experience when working with youth. There could be other reasons for the variation in responses compared to other participants of the study but there is little evidence to demonstrate why this might be the case.

5.5 Additional Findings

In this section I will try to further explain additional themes, patterns, and other phenomena that were identified from data collected through the semi-structured interviews and focus group discussion. These findings did not necessarily relate to only one group such as students, employers, or staff but rather can either be ascribed to multiple groups or are considered unique on their own. Additionally, themes within this section are primarily focused around soft skills such as communication, problem-solving, teamwork/collaboration, and time management that were identified by participants as being important for success in the workplace.

5.5.1 Communication skills.

The first pattern that was identified earlier in the chapter but was not explained in detail is the common belief that communication is the leading soft skill that is needed to succeed in the workplace according to the responses provided by the majority of the participants. What makes communication skills exceptional when understanding how to succeed in the workplace? The argument can be made that communication skills are vital to success because they link to many other soft skills that have been identified in this study. For example, in order to work within teams and collaborate with others, ask for help, and receive feedback, varying forms of communication are needed to ensure these other skills are also adequately utilized correctly on the job. All four domains of communication and language such as writing, reading, speaking, and listening are needed to support how information is either provided to or obtained from external sources.

According to one study conducted by Stevens (2005), a survey was provided to 104 Silicon Valley employers who were all asked whether they were satisfied with the

communication skills of new graduates. The results indicated that many employers were dissatisfied with communication in multiple areas. The study further indicated that employers believed that good communication skills are important to complete a multitude of tasks on the job such as providing presentations to the public, writing emails, interviewing, learning new software, and showcasing interpersonal skills. Furthermore, the lack of good communication skills leads to many employers firing employees, and often such deficiencies in communication are also barriers to obtaining employment opportunities, specifically for those individuals for whom English is not their native language.

Overall, having good communication skills can lead to opportunities at the minimum for getting an interview. For example, if an individual has the writing skills to put forward a good resume or develop an attractive LinkedIn profile, the next logical step would be to fill in an application form, which again requires a good command of language. Furthermore, once an individual makes it through to the next round of hiring, the interview whether on the phone or face-to-face will showcase the individual's ability to articulate their experiences and fit for the position. Once the person is hired, they will still need to demonstrate their ability to learn, ask for help when needed, and handle criticism and feedback. Thus, it can be argued that communication skills are to be considered the core or, from a connectivist perspective, the node that connects all other soft skills and builds the basis and framework for a pathway toward successful outcomes for an individual in gaining employment opportunities.

5.5.2 Problem-solving skills.

The very first observation that is evident in relation to problem-solving is the vast difference in opinions between staff versus students and employers. Staff tended to rank

problem-solving as a much higher rated attribute, within the top third of all listed skills, as a characteristic that leads students to success. Students and employers on the other hand indicated that problem-solving ranks in the lower third and it was rarely mentioned by participants. According to descriptions by both students and employers, it was apparent that problem-solving can be coupled with other terms such as creativity and innovation.

One reason for this is that when individuals are hired for entry-level positions, the type of job may not be very difficult. It may take a few months to a year to perform adequately on the job. Thus, not a lot of innovation or creativity is needed to perform day-to-day tasks in relation to the IT-specific roles. However, employers also indicated that those who take initiative and begin to provide creative solutions to improve daily tasks are those that tend to progress in their careers. Therefore, though problem-solving is not necessarily a baseline skill to do well on the job within the immediate and short-term, it is an acquired attitude toward life that can support long-term growth and sustainability within the workplace.

From the staff perspective, the role of the program is to ensure individuals are employment-ready at the time of completion. Thus, it can be inferred that staff hold problem-solving as being of great value because they not only want participants in the program to succeed in obtaining employment for short-term purposes but to stay in long-term sustained work for many years to come. Thus, it is possible that staff may believe that obtaining a problem-solving attitude earlier on in a student's career will support greater success outcomes as students progress within their careers.

5.5.4 Teamwork and collaboration skills.

On the opposite end of the spectrum from problem-solving, teamwork/collaboration was ranked lower by staff and in the top third by student and employers. Again, this phenomenon is challenging to justify but was noticeable within the data and I felt an attempt should be made to explain why there was a gap between varying groups in the study.

From the student and employer viewpoints, teamwork/collaboration seem to be an expected day-to-day experience. Long gone are the days when IT professionals worked alone to develop a task. As IT is integrated into the everyday lives and services of all operations, it is important that those with technical skills can work not only with their peers but also with their counterparts in other departments that may not have the knowledge of the technical details. It is easy to see why teamwork/collaboration are critical to success within the workplace.

On the other hand, from the staff perspective, it was interesting to see that it was not as important as other skills listed. Perhaps, due to the nature of the program, students that they are responsible for are always in groups and working collaboratively with each other. Therefore, it was not considered as a skill that was needed because they have integrated this type of environment to simulate the workplace. Furthermore, as staff are at a further distance from the workplace than students and employers, they may not appreciate how important and central teamwork and collaboration is to the job opportunities students are obtaining.

5.5.5 Time management skills.

Lastly, the final trend identified throughout the data was the consensus among students, employers, and staff on placing a low emphasis on the importance of time management. Time management was the least mentioned skill among students and employers and, though higher among staff, it was still ranked in the lower third among the rest of the skills listed. A major reason for this could be that though the nature of entry-level IT roles requires immediate action, such as logging request tickets, documenting bugs, or developing features into applications, the notion of accountability outweighs the need for time management. What I mean by this, is that since most of the students have indicated that working on a team and collaborating with others is important, there is a greater need for accountability between members within a team which places less emphasis on individual self-discipline and planning. Therefore, the completion of an individual's work is reliant on what others complete, and vice versa.

In addition to this, as stated in an earlier section, employers indicated that quantitative measures are easy to track, and perhaps many individuals entering the workplace have been expected to hand in work based on strict deadlines. Thus, it has become engrained in workplace culture, and as a result is no longer considered an important skill but something that is expected to happen organically when working within agile environments.

5.6 Contribution to Knowledge

This section provides a model that integrates findings from the literature review in Chapter 2, the theoretical perspectives brought forward in Chapter 3, and the data collected

as explained and presented in this chapter into a cohesive model that demonstrates an ideal

path for successful employment for youth entering the IT workforce. Figure 5.6-1 below is a

representation and culmination of success factors placed within a holistic framework that

includes the perspectives from varying stakeholders that have been discussed throughout
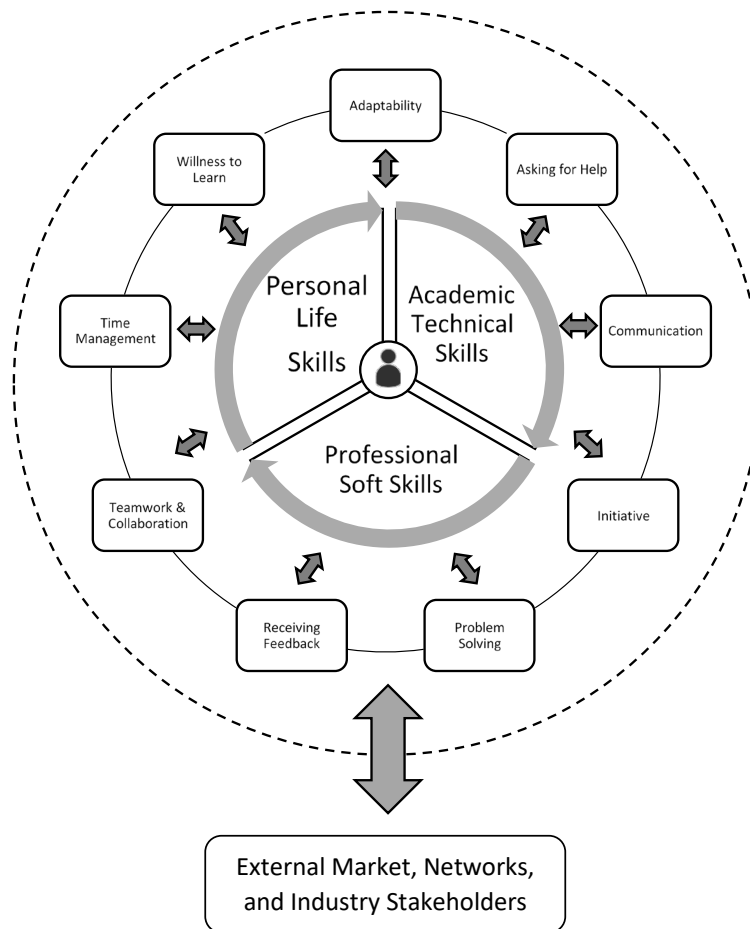
the study.

Figure 5.6-2 Employability success model for youth

To correctly understand the basis behind this model, it is recommended to begin at the

center of the diagram and then work outwards. At the core of the model is the student who

has a 360-degree view of the rest of the model. It is also important to consider the youth at

the core of the model because these are the individuals who are primarily responsible for navigating a digital economy through the support of other stakeholders such as industry experts and educators. As affirmed in Chapter 2, many young adults are often left in a state of confusion when translating their learned experiences into tangible and successful employment outcomes due to the lack of directed guidance from education institutions that have been of services to them. Thus, by ensuring that the student or learner is at the center of the model, there is a greater emphasis on the need for supporting and developing equal educational opportunities for youth regardless of past educational experiences or credentials presented to obtain employment.

In other words, democratizing education and validating the talent that any individual brings forth whether in traditional or non-traditional learning settings can be directly translated into successful employment outcomes. And even more so, when it comes to opportunities offered as entry-level roles within the IT landscape, placement of non-traditional diverse youth in such positions happens if, and only if, the focus leans toward improving the student experience within varying learning environments. However, how this is achieved is explained in more detail within the next layer of the model.

The second layer, outside the core of the model, showcases three distinct learning domains and broad areas of knowledge labelled as personal life skills, academic technical skills and professional soft skills. Each domain is vital to the success of the student such that they offer interrelated and codependent skill sets that should also be equally valued and therefore evenly balanced. To better visualize this layer, consider this section of the model as a spinning wheel while the rest of the model remains in its place. The cyclical and rotational characteristic of the domains, from the vantage point of the student and those

responsible for educating these students and specifically from a curriculum and programmatic perspective, indicates that the core context does not change but the content that informs instruction within each domain does. Thus, agility and continuous iteration and improvement of the content through consultation within and between domain levels is required to determine not only which skills are necessary to be successful in the workplace but which specific sets of skills matches to varying types of jobs offered in the digital global economy. This process ensures that content and curriculum are always up to date with industry trends.

Within the third layer of the model are the nine employability skills (along with double headed arrows) as identified in this chapter as the common success indicators from varying stakeholders that were interviewed. As stated in Chapter 2 there is a increasing blurring between what measurable skills directly lead to successful outcomes and, though there is an agreement between participants of the study about which skills are important, there is an understanding that skillsets will also vary depending on what an organizational mission is based upon and what individuals value as objective and subjective success factors.

Thus, the double headed arrows represent the variation and context of skill. For example, the definition and potential for someone learning how to take more initiative on the job will look different from the view of applying technical skills versus personal or professional skills and will likely change over time. However, what remains true is that skills are transferable between domains regardless of the rotational degree of the domains as described earlier.

In the outermost layer of the model there is a dotted line. This line represents the permeable nature of the influence which external market trends, networks and industry stakeholders can bring to bear on what skills are considered most valuable for youth to learn and succeed in the marketplace. Thus, the sponge-like behaviour allows for additional skills to be added, removed or modified, thereby expanding or contracting layer 3 as needed. This layer also promotes open dialogue (as represented by the large double headed arrow) as well as a dedicated pipeline for information gathering for research between educators (responsible for layer 2) to inform the student experience at the core of the model.

Finally, the entire model also adequately provides a pretext for meeting Siemens' eight principles of connectivism as discussed in Chapter 3. For example, this model presents aspects such as:

- Considerations for varying diverse perspectives on success from different stakeholders, a permeable border that interacts with different nodes of information outside of itself thereby increasing connections;

- Factors that present an urgency for consistent change and can transform as a result of newfound perspectives;

- Embedded understanding that what is important today may not be tomorrow;

- Encouragement of continual learning and development of core skills which place the learner at the center.

These aspects are all tell-tale signs that this is modern framework for the digital era. Thus, the model is meant to be an evolving and changing framework that represents how the flow of information is established, interrupted, and then re-established at different layers in order to reclaim efforts in dedicating support for individual youth to connect the dots between a global knowledge economy that is constantly in a state of variability and change and an understanding that this is even more so within the field of IT.

5.7 Answering the Research Questions

In this section of the chapter, there will be an attempt to answer questions presented earlier in the thesis. This portion of the research will also offer further explanations of whether data collected provides suitable conclusions to issues revealed throughout the research. Additionally, to ensure that data aligns with questions posed, it is important to restate the problem originally established in Chapter 1.

The main problem that initiated this research was that there were mixed interpretations of key skills and competencies students should be proficient in in order to succeed in both academic and workplace settings. Additionally, there are differing views from varying stakeholders including students, employers, and educators who all have their own definitions of success and what skills lead to successful employment outcomes.

At the present time, students have a plethora of educational platforms from which to select. However, when attempting to decipher what technical competencies and which soft skills will help support the transition from academic institutions into practical workplace conditions there is a lack of data on the type of education which is most effective. Furthermore, there is also a disagreement on the type of skills themselves between varying

stakeholders, and data would be difficult to interpret even if it existed. Thus, this shortage of guidance and support in providing insight to understanding the complexities of the new global knowledge economy has left students in a state of confusion. They are unclear what to pursue and what to focus on, which impedes their progression toward meeting their personal success outcomes.

Throughout the study, varying groups that have worked with youth have indicated what they believe to be vital and critical success factors. These perceptions will be used in attempting to answer the first research question:

- How is student success perceived by varying stakeholders towards individuals entering the IT industry?

Though data has depicted that both students and employers have demonstrated that they have a common understanding on the type of soft skills that are needed to achieve successful outcomes within the workplace, each group has also shown that they have varying perceived notions of success as well. When students were asked how they knew they were successful on the job, five of the eight participants indicated they perceived success by being praised and validated based on the work that they do. Some students indicated the confirmations that they received from customers while others indicated that it is the positive feedback that they receive from team members and managers which validates their success. A few other student participants also stated that they perceive greater success when they are provided with more responsibility or additional projects to complete. "Trust" (S1) and "confidence" (S3; S8) are keywords that seemed to directly correlate with taking on larger more complex projects. Overall, students believed that they were perceived to be more successful if given greater responsibility, thereby setting them

on a path to be entrusted to do more than the entry-level work that they were hired to do. This was made even more evident when one student stated, "success is defined by the projects and levels you are on" (S1).

Aside from verbal validation, many students also indicated that they observed success when they were able to complete a project and see how their work was being implemented and used outside of work and in the real world. The satisfaction that one receives that all the work they've put into a project is helping or providing a service to others indicates that their work is valued. One student stated that they measure success by seeing "when someone is happy at the end of the day, even if it takes some time but their problem is solved, that is how you measure personal success" (S8). Another student stated that the "creation of a product and formulating their own strategy [in order to see] someone is happy, regardless of the number of tasks it took to complete" (S3) is considered success. Interestingly, most students within entry-level roles who had minimum to no prior experience within traditional higher education systems still considered themselves to be successful, and all students stated that they understand that there is consistent work needed to be done to improve on soft skills in order to continue to be successful within the workplace. Thus, overall from the perceptions of student's success is substantiated through acts of validation about one's work and tasks they have accomplished and has no relation to the level of academic achievements one has obtained but rather the type of work they are trusted to complete and deliver on.

From the employer perspective, when asked how they knew students were successful, many employers stated that success was based heavily on performance on the job. Career progression was mentioned from a few employers with respect to moving away

128

from entry-level roles as such roles can "become mundane…and moving away from contract into full-time roles" (E1) shows motivation of an individual based on their performance or wish to grow with the organization. Employers also stated that other aspects of student success within entry-level roles related to IT were based on "going beyond, looking for more work, looking to contribute to the organization beyond the baseline work" (E6). Additionally, other employers stated that success of a student is based on whether students "are truly motivated and work on their own time to take initiative to get other projects done and shadow other teams other than their own" (E5).

Furthermore, success from an employee perspective is achieved by those individuals who continue to engage through meaningful communication and are willing to continue to learn while overcoming any challenges they face on the job. Overall, those individuals will have long-term success as described by many employers who are coachable and willing to take advice, not as a sign of compliancy but as a sign of enthusiasm while maintaining an open mind and in order to remain adaptable to work within a culture and environment. Thus, "meritocracy such that individuals are promoted based on performance" (E5) and individual motivation to do extra and perform beyond what is expected from an employer stance is what is perceived to equate to student success through a specific set of soft skills that can be learned through experience in the workplace.

From a staff perspective, the success of a student in the workplace was not as clearly presented as it was by students and employers. Staff perceived success of students to be based on the growth from the time a student enrolled in the non-profit skills program to the time they were successfully placed in a job. Narratives and experiences of students performing on the job were not explicitly mentioned within the focus group, however, the

notion was stated that students who exhibit increased "confidence" (FG2; FG4) in themselves are likely to be more successful on the job. However, some staff stated that those who perform well during the program, such as earning certifications and showing a strong work ethic throughout the duration of the program will succeed not only in earning jobs but also in sustaining long-term employment. Thus, from a staff perspective, student success is perceived to be the increase in confidence and growth of an individual that is learned or revealed through the program and these attributes are then carried on into the workplace.

With respect to the second research question:

- How do skills that determine academic success connect to measurable levels of employability for these students?

Unfortunately, unlike the analysis above, there was no distinct data that I collected that would be able to provide substantial support in answering this question. Quantitative measures will vary based on the environment in which students are placed, for example, whether a student can pass a test or produce an assignment within an educational environment will likely differ from the type of work they are being evaluated on in the workplace. Therefore, it is important to look at how students, employers, and staff provide qualitative measures of success based on technical aptitude as well as soft skills along with other competences that describe the overall profile of a student. Thus, there is a connection between academic and career success but at the present time there is no process that I was able to reveal through research from the employers other than traditional applications and resumes which were admittedly still plagued with implicit biases based on academic qualifications and credentials.

If we want to be able connect measurable levels of success between academic and workplace settings, students and staff would have to work closely together to determine what they feel are areas of growth and strengths for everyone based on core competences. Lists and skills such as those demonstrated in the tables from previous sections, in addition to or instead of traditional grading scores, could be used to support students in learning how to further communicate their skillsets to employers when searching for opportunities to work.

Similarly, if this type of data was shared with employers then there could be increased involvement from industry to determine whether specific individuals have the profiles and skillsets in both technical and employment readiness indicators that would match roles in their respective departments and organizations.

As can be seen, there are multiple perspectives on the beliefs of perceived success based on varying factors from each type of group that were involved in the study. Table 5.7.1-1 below summarizes all information provided up until this point of the paper including the comparisons of both what is believed to be achievable outcomes as well as the perceived notions of success between these groups.

Table 5.7.1-1 Comparison and summary of perceived success for students working in entry-level IT roles determined by students, employers and staff.

Success Indicators	Students	Employers	Staff
Top 3 soft skills to support success in the workplace	• Communication • Willingness to Learn • Teamwork/Collaboration	• Communication • Willingness to Learn • Teamwork/Collaboration	• Communication • Willingness to Learn • Problem Solving
Perceptions of higher education and academic success in relation workplace performance	• Valued but not needed • Higher levels of education support in obtaining leadership roles within the workplace	• Valued but understand that credentials do not reflect performance in entry-level roles within IT • Overall, indifferent to qualifications all else being the same with respect to soft skills	• Valued but does not necessarily prepare students for work • Emphasis on workplace learning and simulation outweighs qualifications
Definitions of success	• Continual learning and professional development • Increased responsibilities on the job • Increased salaries based on performance on the job	• Validation through promotion and recognition of work • Autonomy to create and ideate to drive success within an organization	• Growth • Grit, perseverance, and small wins
Descriptions and keywords related to perceived success in the workplace	• Increased trust and confidence from individuals • Servicing others and providing value through work • Validation about one's work in order to achieve higher level roles within an organization	• Level of performance on the job • Motivated to go beyond what is expected	• Showing increased confidence • Showing personal growth • Ability to transfer learning from academic settings into the workplace

In the end, it seems as though that there is a clear gap between how different stakeholders perceive success versus how these same stakeholders are willing to work together to develop solutions based on agreed measures of success. Thus, in the final chapter of this paper, I will explain how the future of work and education will be better able to utilize advancements in technology in hopes to find solutions and opportunities for further research that will bring various stakeholders closer to closing the gap, and in understanding how success translates for students moving from varying academic settings into the workplace.

CHAPTER 6 LIMITATIONS, NEW KNOWLEDGE, AND SUGGESTIONS FOR FUTURE RESEARCH

6.1 Introduction

In the final chapter of this thesis, I will provide a brief summary of findings from Chapter 5 and explore the limitations of the research and make efforts towards explaining the validity of findings from the overall study. Additionally, this chapter will also delve into and investigate the influence that my institutional, professional and personal context has had on my personal definition of success, and how this has changed over time due to the reflexive nature of the study. Furthermore, this chapter will also consider varying technologies and their implications on the future of work and education and make suggestions for further research in relation to student success. Lastly, this chapter will conclude with a brief summary of research conducted and will provide my final thoughts on the overall purpose of the study.

6.2 Brief Summary of Findings

In the previous chapter, data suggested that there was strong evidence that all three groups - students, employers, and staff - agreed that soft skills were pertinent to an individual achieving success. The nine soft skills that were uncovered included adaptability, asking for help, communication, initiative, problem-solving, receiving feedback, teamwork/collaboration, time management, and the willingness to learn. Although the level of importance assigned to each skill varied among individuals of each group, the consensus was that soft skills are attributes that will need to be continuously improved upon in order to lead individuals to greater success outcomes on the job.

Additionally, with respect to academics, there was no indication from any of the three groups that when a student achieves higher levels of education there are greater success outcomes. However, the majority of the participants in all three groups indicated that they understood the value of obtaining higher education in relation to personal achievement.

Furthermore, when answering the first research question, it was clear that perceived notions of success of those individuals entering the IT workplace were also varied across groups that participated in the research. Students perceived success to be correlated to the amount of work they have been given, along with the validation from people outside of their immediate network indicating that they have contributed to a greater cause or mission in serving others. Employers on the other hand attributed perceived success to students' performance on the job and taking ownership of their own success by achieving and completing tasks that went beyond what they were hired to do. Finally, staff perceived student success through the performance within the program but also in applying newly found confidence and grit into the workplace to grow within their careers.

Although data provided clear insights into the types of soft skills needed to achieve success within the workplace along with the varying perceptions of varying groups, there was not enough information to sufficiently conclude how academic success correlates with measurable levels of employability of these students. Thus, the final sections of this chapter will provide insight into limitations of the study and potential technological applications on the future of work and education.

6.3 Limitations of the Study

Through this research, I was able to determine whether there were identifiable characteristics and skills that linked student success from academic settings with success in the workplace and how this was measured. However, there were also some limitations to this study.

The first limitation to this research was with respect to sampling. Though I was able to provide insights from three major groups, the study would have benefitted from interviews of a larger population of students and employers. This would have allowed for more insights into the variances between organizations such as the time students had spent within employment, whether some types of roles indicated greater success versus others, connections between the type of technical skills in relation to potential promotions into leadership positions, among other possibilities.

Another limitation, as with most qualitative studies, was also time. The amount of time to interview the participants that I managed to connect with was a challenge. There were some instances where I had to reschedule, cancellations, and some individuals invited to participate either did not respond or opted out of being a part of the study, which required me to take more time to find other suitable candidates willing to take part in the study. Additionally, I met with individuals over a variety of mediums and environments such as in-person, over the phone, and over video chat using various platforms based on what the participant was most comfortable using. Organizing time to structure the interview within these varying mediums also proved to take up more time than expected.

Further limitations included the environment in which the study was conducted, as research was performed solely in a Canadian context. If there had been additional time as

described above, it would have been ideal to locate potential participants that worked within not only Canada but also other countries. However, considering my professional setting, this would have taken much more time to find participants outside of my scope. Had this been possible, this would have provided a much more global context and would have possibly further challenged the findings of the study.

Lastly, there may have been additional insights or differing views of the types of soft skills that were more aligned with what staff observed rather than the list provided to them. Additionally, if more time had been allotted, it would have been advantageous to conduct a second focus group that could have been comprised of educators working in different contexts within organizations other than those limited to my professional context.

Finally, though it would have taken a lot more time, when beginning the study, it would have also been ideal to have investigated tools used by employers to measure performance within their respective workplaces. However, this would have required a lot more time and greater assurances of privacy and confidentiality within the participant information sheets and may also have resulted in less participation from employers than I was able to achieve.

6.4 Transformation of Institutional, Professional, and Personal Views of Success

With limitations of the study aside, throughout the duration of the research, and at different stages of data collection and analysis my views on the future of education and the future of work have changed multiple times. At the beginning of the study, my perceptions of success were narrowly focused on academic success and career success as two unrelated phenomena. As time went on, and as I collected data through the research, I began to

realize that these two seemingly separate concepts are intricately intertwined with one another and are not mutually exclusive. Thus, my latest conclusions are based on my personal experiences over the years within varying forms of education and working in diverse work environments and after having analyzed my research data.

From an educational stance, I have personally experienced traditional, non-traditional, blended and fully online forms of education. Of all these differing forms, I felt that the fully online experience provided me with the greatest advantage of learning on the go at my own pace and has also shown an added benefit of earning credentials to pursue higher education as required by societal norms. Through online experiences I have also been able to obtain several certifications in relation to areas of passion and out of general interest, and not out of necessity to fulfil a specific job or role within an industry. However, in other cases, I was also driven to learn knowing that the quality of my work on the job would get better due to the increased knowledge I gained, and the positive recognition by members within organizations in which I worked.

All my academic experiences both traditional and informal non-traditional formats have been conducted largely without or with minimal guidance and input from mentors. The one exception to these experiences was my time pursuing my teaching degree which required working hours within classrooms guided by a more experienced teacher, yet during this time I still felt that personally, learning has been an intrinsic motivational journey. Overall, traditional formats of education that I had experienced from the time of high school leading into higher education did not appeal to me, and I was often questioning whether what I was learning would be applicable to the world around me when pursuing a career outside of school.

With respect to my career-related experiences, they are as equally diverse as my educational experiences. I've worked in all types of school formats including public schools, private schools, higher education institutions, as well as non-profit organizations, in both Canadian and international settings. With respect to my technical work experiences, I have worked in start-ups, midsize organizations, and directly with larger corporate companies. The soft skills that I have gained along the way are largely based on the performance and feedback provided to me through varying assignments in the workplace and project-based tasks assigned to me through varying education contexts that I expressed above.

I say all of this to demonstrate that learning for me has always been fluid and organic. Learning on the job was a natural progression toward my subjective success more so than objective success as interpreted by external factors. Though I have experienced apprenticeship models that have guided me toward greater cognitive development as seen from a social constructivist perspective, I still feel that within both academic and professional contexts there is a greater need to embrace the acquisition of knowledge from a connectivist perspective in the future.

If I had the same opportunities to learn in online courses and if society regarded these experiences as equally valued as traditional schooling, I believe I would have still been as successful in my academic pursuits as I have been up until this point as well as equally successful in my career pursuits to date. Moreover, I believe I would have spent a lot less time and less money in achieving my goals. I believe this freed up time would have been better spent focusing on my subjective success and personal growth. Thus, this research has further confirmed for me that both the future of work and future of education need a massive overhaul.

Additionally, industries and workplaces should also begin to embrace a diverse stream of academic qualifications from varying non-traditional and other forms of education to influence individual objective and subjective views of success. In order to accomplish this, all forms of educations would need to be valued equally by all stakeholders, and emphasis should be placed on an individual's willingness to learn, along with the other soft skills and competencies such as those listed throughout the thesis. As a result, I believe that this could lower the impact of any implicit discrimination some individuals face from their schooling and past work experiences when applying to varying jobs.

Thus, in the following section I will provide more concrete examples of how education and work are still at the early stages of disruption and adoption by several academic institutions and organizations, and how such innovations will likely lead to more accurate accounts of measurable levels of success for varying stakeholders in the future.

6.5 Suggestions for Future Research

According to a report on the future of jobs conducted by the World Economic Forum (2016), many industry experts suggest that we are at the point of entering the Fourth Industrial Revolution. This evolutionary shift is explained by the blurring lines between physical, technological and biological domains such that Artificial Intelligence (AI) has vastly changed not only the way in which individuals work but also how they learn (Butler-Adam, 2018). More specifically, according to the World Economic Forum (2016), among the demographic and socio-economic drivers of change, youths moving into emerging markets directly affected by convergence of digital and human experience account for 13% of the

top rated global trends to disrupt and change the "dynamics of the global employment landscape" (p. 5) expected to fully develop by the year 2020.

The report provided by the World Economic Forum also further implies that for academic institutions there is a need to increase the types of educational initiatives that both support the shifting landscape of work and include talent from both the developing world and leading emerging nations.

In relation to the research that I have conducted within this thesis there are emerging and exponentially developing technologies that will effectively support the socio-economic shifts in both workforce and education. These include the implications of blockchain applications and the impact of AI on the future of work and education explored within the sections to follow. Furthermore, what will be discussed in these sections is the added disruption that these technologies have on "changing the skills that employers need and shortening the shelf-life of employees' existing skill sets in the process" (World Economic Forum, 2018, p. 19), and how these technologies themselves are useful in developing processes that manage and inform these changes with varying contexts.

6.5.1 Implications of blockchain applications on the future of work and education.

Bitcoin was first introduced as an online decentralized currency also known as a cryptocurrency in 2009 to compete with banks as an alternative method for managing financial transactions and payments while also reducing overhead costs for end users (Baur, Hong, & Lee, 2018). Though Bitcoin has been under scrutiny by many financial analysts due to its volatile spikes in market value (Baur, Hong, & Lee, 2018), the technology driving this currency known as blockchain has had a wide array of potential uses in industries outside of

financial systems including healthcare and education (Turkanović, Hölbl, Košič, Heričko, &

Kamišalić, 2018).

With respect to education, there are several initiatives that have begun

experimenting with and have implemented blockchain technologies including one from MIT

Media Lab that has produced a full-scale alternative to credentialing system (Jirgensons &

Kapenieks, 2018). In 2017, MIT issued the first set of digital diplomas completely secured

through blockchain ledgers to students that successfully completed courses through MIT's

Media Arts and Sciences and Sloan School of Business (Grech & Camilleri, 2017). This

transaction removes the need for any intermediary to authenticate the diploma and

distributes control back to the individual student thereby reducing administrative costs.

Time credits are transferred between higher education institutions to students enrolled

within these schools.

This seemingly simple transaction between an educational institution and a student

has opened potential opportunities for other conceptual frameworks to utilize blockchain

for more than just storing and sending credentials. Another initiative by the Institute for the

Future (IFTF) is a plan to develop a digital learning management system which will converge

learning, earning, and living by the year 2026 (Means, 2018). Means (2018) states that the

IFTF has high hopes that this new learning platform known as *The Ledger* will provide

several benefits to its users including:

- Employers can match an individual with projects and 'gigs' that perfectly fit the
  level of learning the individual has right now. There's no need to finish school to
  have a thriving career;

- Individuals have a complete record of how much income each skill or lesson they've learned has helped them generate – so they know the exact value of every part of their education;

- Investors can help pay for one's education. In return, they get a percentage of the individual's future earnings tied to the skills they paid for them to learn. This fuels a new speculative economy as people invest in building a workforce for what they hope will be the most lucrative skills. (p. 326-27)

This projection of the future of work and education is a deliberate attempt at disrupting the traditional higher education system and offers complete autonomy and responsibility to the learner thereby removing current linear and rigid structures of learning (Means, 2018).

However, like all technology initiatives, *The Ledger* comes with its disadvantages. The IFTF indicates that though there are obvious benefits such as flexibility between work and learning and potentials to earn a greater income, some drawbacks of *The Ledger* would mean that the continued need to upskill and search for jobs to sustain a living could also cause increased instability and stress within individual experiences (Means, 2018). Thus, soft skills, emotional intelligence, and self-efficacy as stated throughout this research thesis will become even more important to navigate this new shift toward a learning economy.

As Means (2018) states,

"this process of learning and earning is optimized as algorithms and data systems enable ubiquitous assessment and evaluation of our personal value, reputation, skills, qualifications, and performance based on the accumulation of learning as a form of work-ready capital" (p. 335).

Hence, there should be even greater consideration for existing academic institutions to include a greater focus on supporting the advancement of soft skills rather than just content.

Furthermore, the implementation of blockchain technology within other non-traditional programs and institutions could 'level the playing field' with other branded and recognized institutions. Such technology could lessen biases surrounding the lack of recognition or level of quality that online programs and non-traditional and vocational programs tend to suffer from (Sun, Wang, & Wang, 2018).

Overall, though the implementations of blockchain are still in the beginning stages, the above examples are only representative of a small proportion of how decentralization of resources and automation will impact the future of work and education. Therefore, in the following section, I will take a closer look at how artificial intelligence (AI) fits into this concept of the Fourth Industrial Revolution and will explore how AI will impact and influence the success of students in both education and the workplace settings.

6.5.2 Impact of AI on the future of work and education.

The entire ecosystem surrounding decentralized, democratized, open education learning platforms such as those using blockchain as described in the previous section, run on algorithms that train machines to learn and perform calculated success outcomes thereby automating processes and increasing productivity that used to take time through manual labour. Together, this entire cycle is driven by a concept known as artificial intelligence (Means, 2018).

AI is not a new concept and has had influence and impacted many industries. Over the past 25 years AI applications have been studied for purposes of enhancing learning

experiences and challenging traditional forms of education (Roll & Wylie, 2016). As

technologies like blockchain have increased the pace at which knowledge and learning

opportunities can be disseminated across varying platforms, AI has the potential to support

in personalizing not only the educational but also the social experience for varying

individuals (Roll & Wylie, 2016).

One example of this is the recent implementation of a text-based AI chatbot at

Georgia State University in the United States during the summer of 2016-2017 academic

year. The purpose of the chatbot was to provide a personal assistant akin to Siri or Google

Assistant that is customized to answer questions in relation to campus life (Bendici, 2018).

Students could ask the chatbot questions about anything they needed support with related

to their experiences on campus and the text-based AI chatbot would not only respond but

also take a proactive approach in reminding students of events around campus and other

important aspects relating to the registrar, financial aid, and even counseling (Bendici,

2018).

Bendici (2018) posits that though the AI systems have the potential of keeping up

with the millions of interactions and providing support equivalent to that of 10 to 15 staff

within the University, it isn't a perfect system. More specifically, chatbots in general

adopted for purposes of social inquiry have the tendency to generate errors such that when

they cannot understand a specific query presented by students, this could cause frustration

among users (Molnár & Szüts, 2018). However, according to Bendici (2018) the reactions of

students at Georgia State with respect to this integrated service have been mostly positive,

and some students have been reported to go as far as to confide details through the chatbot

that they wouldn't have otherwise provided to their human counsellor.

Thus, the implementation of AI in combination with blockchain technologies not only has the potential to provide individualized feedback to students but also acts as guidance toward their learning experiences through simulated social interaction. Again, all these technologies are in early stages of testing, but institutions and educators should begin to consider how to integrate these tools to support and develop collaborative experiences for their students (Luckin, Holmes, Griffiths, & Forcier, 2016).

Other examples of AI that have extended the concept of social interactivity include Carnegie Mellon University's development and research on the Socially Aware Robot Assistant, or SARA for short, that uses visual, vocal, and verbal cues from participants through an online platform, and then reacts and answers questions through feedback mechanisms impersonating human intonations in speech, gestures, and facial expressions which act to influence and increase rapport with the user as it is used more frequently over a period of time (Chen, Cassell, Pecune, & Matsuyama, 2018). This implementation is already a step up from Georgia State's chatbot: one of the main goals for SARA is to increase interpersonal relationships with end-users such that it can provide recommendations based on socio-emotional reactions and user preferences (Chen, Cassell, Pecune, & Matsuyama, 2018). Though SARA has been field tested to work with individuals attending conferences to match participants with sessions of others to meet their own interests and goals, there have also been recent studies on implementing these same AI tools within schools to support social education as a virtual tutor for students that will have the capability to measure engagement and motivation, and increase rapport to build connections with students and guide them through their work.

All these examples using AI above have demonstrated direct impact on the future of education and may have proposed somewhat of a dystopian future where robots take over the world, a feeling that many of the industry leaders feel in relation to automation and the increased potential toward unemployment (Luckin, Holmes, Griffiths, & Forcier, 2016; Means, 2018). However, this notion that people will remain jobless due to automation and implementation of AI is still up for debate. Some researchers state that the incorporation of AI could lead to economic and wealth inequality among lower skilled workers while other researchers indicate that the employment shifts due to the impact of AI and other technological disruptions will in fact create new jobs (Pavaloiu & Kose, 2017). Yet, regardless of views, what can be agreed upon by most people is that AI is already impacting our daily lives and that there is no slowdown of these tools from being implemented across industries (Dignum, 2018).

As a result, many educational institutions should begin to embrace the inevitable, and think about how to embed AI and other technologies within daily practice while also supporting the transition of teachers into playing very different roles within these institutions (Roll & Wylie, 2016). Luckin et al. (2017) suggest that teachers and educators will play a central role in implementing, designing, and orchestrating how AI tools and resources will be utilized and further support an increased focus on 21st century competencies and character-building qualities. Learners will need to navigate a new world that will become increasingly reliant on automated processes but equally dependant on human-centric interactions within the workplace. Thus, the next section will explain a suggested new model for work that considers the importance of the integration of new

technologies that shift away from rigid educational systems and provide value in the increased focus on soft skills and competencies.

6.5.3 A framework for the future of work.

According to the World Economic Forum (2016), it is estimated that 65% of those children that are entering the primary schools today will likely work within jobs that do not currently exist. This is largely influenced by the implementation of technologies like AI that have automated and are already replacing low skills jobs, which conversely causes an increase for a newly defined digital skills to work and succeed within these new thriving workplace environments (Pavaloiu & Kose, 2017). Organizations like Knowledge Works (KW), a philanthropic organization, have already begun preparing for this new economy. They are working with over 30 universities across the United States to develop potentials for incorporating new technologies in educational contexts while fostering initiatives and developing marketable solutions that will support the integration of new skills in preparation for the future of work (Means, 2018). Means (2018) explains that KW recognizes that the pace of change in the workforce is not adequately reflected within academic settings, and through their platform, like IFTF's *Ledger*, KW will help in reconceptualizing how learning and labour will progressively support each other while also reframing what skills are needed as jobs and careers begin to emerge and present themselves through strategic forecasting.

Other organizations outside of educational contexts, such as IBM, have also begun to prepare for the future of work and understand that there is a fundamental shift in how education supports the adoption of up-to-date skills within the context of the new economy through an initiative known as *new collar* work (Pavaloiu & Kose, 2017). IBM's CEO, Ginni

148

Rometty, coined the term to express the need for the curriculum to be aligned with marketable skills in technology-related fields. One way to do this is to not only train individuals, thereby replacing higher education models altogether but also hire them directly to fill the needs of the organization (Balakrishnan and Lovelace Jr., 2017).

The most recent report conducted by the World Economic Forum (2018) on the future of jobs has not only validated findings in the 2016 report but has also suggested business models that further support Rometty's thoughts on reskilling needs across multiple industries. The report suggests that lifelong learning should remain a top priority within organizations who wish to retain highly skilled workers as well as to establish measures of success for new talent entering the global labour market. According to the World Economic Forum (2018) it is estimated by 2022 that 54% of individuals currently in high-skill jobs will be required to reskill and upskill and continue to require additional training as skills needed to perform jobs become increasingly complex. As a result, other human skills such as soft skills will also continue to increase in value. Thus, though the consistent need to reskill and upskill are vital to ongoing success of an individual within the workplace, the true measurement of success is still fundamentally based on the implementation of professional and personal skills needed to navigate within a range of diverse work environments.

6.5.4 The importance of new technologies for youth entering the IT workforce.

As stated in the very first chapter of the research study and as seen throughout the thesis, the skills gap, particularly for those individuals employed in low wage, white-collar jobs, is widening due to rapid adoption of new technologies such as those mentioned in this chapter. As explained above, the new economy has already begun, and thus it is important that education institutions both traditional and non-traditional begin to learn and

understand how technologies like blockchain and AI are not only disrupting the workforce but how such technologies can augment the role of the traditional educator to support youth in navigating into fluid and decentralized workforces. What the best method of adoption looks like is yet to be seen, and it is up to the individual institutions to determine which methodologies would support their organizational mission and values as can be seen from examples provided earlier in the chapter.

However, from the stance of an employer looking to fulfil the roles specific to the IT sector, and as explained in Chapter 5, the majority of youth, employers, and staff as well as the literature in Chapter 2 seem to agree that life-long learning is essential to ensure successful outcomes in the IT workplace. Thus, the implementation of technologies such as blockchain and AI will allow for rapid skill development and on-going personalized learning that will provide additional motivations to work rather than just relying on objective success indicators such as increased salaries. Investment in ongoing personal and professional development is just as important as training for obtaining the hard-technical skills needed to perform tasks on the job. This idea was further confirmed by many of the participants in the study such that it is the knowledge gained to support people, whether solving their IT problems or developing products, that proves to have a positive impact on society at a global scale. In other words, communicating and working with people to find common solutions to complex business and world issues requires more than just reliance on technical skills. Thus, what this research study has confirmed is that there are more efficient methods of providing skills training for specific roles within the IT industry as long as there is ongoing dialogue between varying stakeholders who agree upon the competencies that are learned

through experience and not necessarily through training that align with the technical skills that are sought after.

Overall, as newer adopted technology disrupts the workplace, educational institutions will need to play catch-up to meet the demands of the industry. As educational institutions begin to adapt and adopt them, newer and improved technologies continue to shift the landscape of the labour market and the gap becomes wider for youth and low skilled workers trying to initiate or change careers. This is a vicious cycle that we have experienced historically many times before. Therefore, it is those educational institutions that become early adopters of new emerging technologies, or at the very least those workforce development-focused organizations that work in collaboration with the industries that utilize such technologies, that allow them to stay informed of the shifts in the marketplace thereby turning the vicious cycle into a virtuous one.

Specialized vocational skills training programs and industry partners can work together toward implementing agile curricular practices that will continue to produce quality candidates who not only understand the IT best practices but also how to best integrate the soft skills and core competencies within the curriculum. Though the advancements in technology along with the jobs of tomorrow are unknown, it is important for all institutions and individuals who attend these non-traditional programs to begin to think ahead into the future and continue to be proactive about how to sustain themselves through acts of continuous learning for the next wave of demands in the IT workforce before they are expected to happen. To accomplish this, such organizations must be open to experiment with and implement the very technologies that are currently disrupting the workforce and be prepared to operate in an uncertain and ambiguous fashion.

6.6 Conclusion

The research demonstrated throughout this thesis was originally conducted to find out whether non-traditional education programs are adequately preparing youth for work and success within entry-level roles in the IT industry, and to determine what skills equate to measures of success for these individuals. However, as we are at the cusp of the Fourth Industrial Revolution, the future of work is unpredictable as the types of jobs and employment opportunities that will be available in the next 10 to 20 years are currently unknown. Thus, it is reasonable to state that the practical skills will also constantly vary due to changing responsibilities within specific job roles and depending on the type of roles individuals are hired to perform and will require more focused training to sufficiently execute technically complex tasks involving big data, blockchain, and AI.

At present, lower skilled jobs are at increased risk of automation and as a result there will be a shift in the global knowledge economy for individuals to continuously learn to fill in knowledge gaps required to perform on the job. Learning within both socially constructivist and connectivist paradigms is beginning to become an essential facet to successful application of learned skills within a new economy that requires individuals to learn and implement learning at accelerated paces to meet the demands of a technologically dependent world.

Traditional models of education and career frameworks that have attempted to define success of individuals from academic settings transitioning into the workplace may no longer be applicable, thus newly framed concepts are needed to align with varying stakeholder needs. Education and learning are on the verge of democratization and IT-focused industries are no longer concerned with learning the specific skills that most

traditional higher education institutions offer and are beginning to look outside of these mediums, and into new spaces that level the playing field for individuals globally.

Thus, academic institutions need also to begin to contribute toward not only the objective but the subjective experiences of individuals such that learning now becomes engrained into everyday culture, not set within limited timelines that focus solely on credentialism but offering lifelong learning services for individuals moving between what seems to be an everlasting cycle of work and school. Partnerships between learners, industry, and academic organizations will need to continue to develop supports and services that will prepare for the impact of technologies that will inevitably change the scope of success and skills for individuals on a more regular basis. Therefore, the outcome of these changes should encourage a shift in learner perspectives to be personally responsible for their own learning without them having to worry about restrictions on what and how to learn.

However, what should also remain consistent as stated through literature, the implications of learning theory, and within research for future work is the continued development of soft skills. Beyond the concept of lifelong learning, there are also other key competencies that are necessary to transition from academic settings and equate to long-term success within an evolving employment landscape. Though some of the skills such as communication and teamwork and collaboration as well as others revealed through this study are valid and will remain relevant within the new economy, however they will also complement attitudes towards lifelong learning that industries will require individuals to have as advances within these markets continue to grow exponentially. Thus, in the end, it is the responsibility of all stakeholders to incessantly evaluate and assess what these skills

are and update and change curricula towards a realistic scope that supports the objective

and subjective successes of all those involved to merge concepts of working, learning and

earning for the future.

Word Count: 45,801

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Appendix A: Participant Information Sheet and Consent Form for Students

Dear [Participant Name],

You are being invited to participate in a research study. Before you decide whether to participate, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and feel free to ask us if you would like more information or if there is anything that you do not understand. We would like to stress that you do not have to accept this invitation and should only agree to take part if you want to. Thank you for taking the time to read this.

The purpose of this research is to determine the preparedness of students who have completed training in non-traditional education programs to meet the needs of employers in the IT industry. The study will focus on understanding the characteristics of student success as individuals enter the IT workforce as well as determining which academic and professional soft skills create links to measurable levels of employability.

You have been invited to partake in this study because you are between the ages 18 to 29, are currently employed or have been within at least the past 6 months in the IT workforce and have recent involvement in a job skills and IT training program. Your experiences will help aid in developing further research in improving professional practice in hopes to bring additional educational value into the institution. However, it should be made clear that participation is voluntary, and you are free to withdraw at any time without explanation and without incurring a disadvantage. There are no specific potential benefits, compensation, or gifts provided to participants taking part in the study. However, there will be a general benefit for providing information to the organization to ensure the continuous growth and improvement of processes that inform future student recruitment and overall success of individuals and the organization.

If you choose to participate in the study, please inform me via email within the next 7 days from the date stated above and I will schedule a time to conduct a brief 30-minute interview via Skype, phone or in person. The interview will mainly focus on and address standards and indicators of success factors and employability skills as they apply to the IT workplace. All data will be kept secured and stored on a password protected external hard drive and then locked in an office cabinet which only I have access to. Additionally, any information transferred to my personal cloud account will also be password protected which only I have access to. In any case the results of the study are anonymized and kept confidential, and no one will be able to identify you or the organization in which you are employed. Pseudonyms will be used in all documentation if needed to ensure privacy. After

interviews are completed, original information will be destroyed, and anonymized data will be further analysed in a focus group to identify patterns and measurements of success. If you choose not to take part in this research, you can withdraw from the study at any time up until the point data is submitted and becomes anonymized.

Whilst I do not anticipate that you will experience any distress during the interviews, you will be aware that information that is collected will only be shared if authorization and permission has been granted by you. During interviews, you have the possibility of refraining from answering questions if you are not comfortable in doing so. Your decision to participate in the study will not be known to anybody other than myself. All information shared and gathered during this time should remain confidential and should not be shared with anyone outside the study after the interview is completed. This study is strictly separated from my professional role as the Senior Education Manager, any information that is gathered will not have any bearing on current or future involvement with the organization, and all data collected is utilized solely as a requirement to successfully complete the doctorate program.

If you are unhappy, or if there is a problem, please feel free to contact the Primary Supervisor Dr. Janet Strivens or myself, Karim Waljee and we will try to help.

If you remain unhappy or have a complaint which you feel you cannot come to us with then you should contact the contact the university's Research Participant Advocate. When contacting the Research Participant Advocate, please provide details of the name or description of the study (so that it can be identified), the researcher(s) involved, and the details of the complaint you wish to make.

For any further issues, you can contact me directly at _____.

Kind regards,

Karim Waljee

PARTICIPANT CONSENT FORM

Title of Research Project:	Defining Student Success in the Age of Data and Analytics: A Study in Determining the Essential Skills, Career Readiness, and Employability of Young-Adults in today's Global Knowledge-Based Economy
Researcher(s):	Karim Waljee

Please initial box

1. I confirm that I have read and have understood the information sheet dated _____ for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my rights being affected. In addition, should I not wish to answer any question or questions, I am free to decline.

3. I understand that, under the Data Protection Act, I can at any time ask for access to the information I provide and I can also request the destruction of that information if I wish.

4. I understand that confidentiality and anonymity will be maintained, and it will not be possible to identify me in any publications.

5. I understand and agree that once I submit my data it will become anonymized and I will therefore no longer be able to withdraw my data.

6. I understand that all information shared and gathered during the interview should remain confidential and should not be shared with anyone.

7. I agree to take part in the above study.

_____	_____	_____
Participant Name	Date	Signature
_____	_____	_____
Name of Person taking consent	Date	Signature
_____	_____	_____
Researcher	Date	Signature

Appendix B: Participant Information Sheet and Consent Form for Employers

Dear [Participant Name],

You are being invited to participate in a research study. Before you decide whether to participate, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and feel free to ask us if you would like more information or if there is anything that you do not understand. We would like to stress that you do not have to accept this invitation and should only agree to take part if you want to. Thank you for taking the time to read this.

The purpose of this research is to determine the preparedness of students who have completed training in non-traditional education programs to meet the needs of employers in the IT industry. The study will focus on understanding the characteristics of student success as individuals enter the IT workforce as well as determining which academic and professional soft skills create links to measurable levels of employability.

You have been invited to partake in this study because as your knowledge of the IT workplace and have demonstrated direct management or involvement with students from non-profit job skills and IT training programs within the at least the past 6 months. Your experiences will help aid in developing further research in improving professional practice in hopes to bring additional educational value into the institution. However, it should be made clear that participation is voluntary, and you are free to withdraw at any time without explanation and without incurring a disadvantage. There are no specific potential benefits, compensation, or gifts provided to participants taking part in the study. However, there will be a general benefit for providing information to the organization to ensure the continuous growth and improvement of processes that inform future student recruitment and overall success of individuals and the organization.

If you choose to participate in the study, please inform me via email within the next 7 days from the date stated above and I will schedule a time to conduct a brief 30-minute interview via Skype, phone or in person. The interview will mainly focus on and address standards and indicators of success factors and employability skills as they apply to the IT workplace. All data will be kept secured and stored on a password protected external hard drive and then locked in an office cabinet which only I have access to. Additionally, any information transferred to my personal cloud account will also be password protected which only I have access to. In any case the results of the study are anonymised and kept confidential, and no one will be able to identify you or the organization in which you are employed. Pseudonyms will be used in all documentation if needed to ensure privacy. After

interviews are completed, original information will be destroyed, and anonymized data will be further analysed in a focus group to identify patterns and measurements of success. If you choose not to take part in this research, you can withdraw from the study at any time up until the point data is submitted and becomes anonymized.

Whilst I do not anticipate that you will experience any distress during the interviews, you will be aware that information that is collected will only be shared if authorization and permission has been granted by you. During interviews, you have the possibility of refraining from answering questions if you are not comfortable in doing so. Your decision to participate in the study will not be known to anybody other than myself. All information shared and gathered during this time should remain confidential and should not be shared with anyone outside the study after the interview is completed. This study is strictly separated from my professional role as the Senior Education Manager to avoid influence and bias towards your participation. Any information that is gathered will not have any bearing on current or future involvement with the organization, and all data collected is utilized solely as a requirement to successfully complete the doctorate program.

If you are unhappy, or if there is a problem, please feel free to contact the Primary Supervisor Dr. Janet Strivens or myself, Karim Waljee and we will try to help.

If you remain unhappy or have a complaint which you feel you cannot come to us with then you should contact the contact the university's Research Participant Advocate. When contacting the Research Participant Advocate, please provide details of the name or description of the study (so that it can be identified), the researcher(s) involved, and the details of the complaint you wish to make.

For any further issues, you can contact me directly at _____.

Kind regards,

Karim Waljee

PARTICIPANT CONSENT FORM

Title of Research Project:	Defining Student Success in the Age of Data and Analytics: A Study in Determining the Essential Skills, Career Readiness, and Employability of Young-Adults in today's Global Knowledge-Based Economy
Researcher(s):	Karim Waljee

Please initial box

1. I confirm that I have read and have understood the information sheet dated _____ for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my rights being affected. In addition, should I not wish to answer any question or questions, I am free to decline.

3. I understand that, under the Data Protection Act, I can at any time ask for access to the information I provide and I can also request the destruction of that information if I wish.

4. I understand that confidentiality and anonymity will be maintained, and it will not be possible to identify me in any publications.

5. I understand and agree that once I submit my data it will become anonymised and I will therefore no longer be able to withdraw my data.

6. I understand that all information shared and gathered during the interview should remain confidential and should not be shared with anyone.

7. I agree to take part in the above study.

_____	_____	_____
Participant Name	Date	Signature
_____	_____	_____
Name of Person taking consent	Date	Signature
_____	_____	_____
Researcher	Date	Signature

Appendix C: Participant Information Sheet and Consent Form for Staff

Dear [Participant Name],

You are being invited to participate in a focus group as part of a research study. Before you decide whether to participate, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and feel free to ask us if you would like more information or if there is anything that you do not understand. We would like to stress that you do not have to accept this invitation and should only agree to take part if you want to. Thank you for taking the time to read this.

The purpose of this research is to determine the preparedness of students who have completed training in non-traditional education programs to meet the needs of employers in the IT industry. The study will focus on understanding the characteristics of student success as individuals enter the IT workforce as well as determining which academic and professional soft skills create links to measurable levels of employability.

You have been invited to partake in this study because of your understanding of the youth demographics and connections between job readiness and IT skills training translating to sustainable work in the IT industry. Your experiences will help aid in developing further research in improving professional practice in hopes to bring additional educational value into the institution. However, it should be made clear that participation is voluntary, and you are free to withdraw at any time without explanation and without incurring a disadvantage. There are no specific potential benefits, compensation, or gifts provided to participants taking part in the study. However, there will be a general benefit for providing information to the organization to ensure the continuous growth and improvement of processes that inform future student recruitment and overall success of individuals and the organization.

If you choose to participate in the study, please inform me via email within the next 7 days from the date stated above so that we can schedule a time to conduct a 1-hour focus group to be held in a secure and private agreed upon common location to prevent any breaches of privacy. The purpose of the focus group is to further discuss and analyse anonymized data and information collected from previous interviews of students and employers to identify patterns and measurements of success in relation to employability. If you choose not to take part in this research, you can withdraw from the study at any time up until the point data is submitted and becomes anonymized. All data will be kept secured and stored on a password protected external hard drive and then locked in an office cabinet which only I have access to. Additionally, any information transferred to my personal cloud account

will also be password protected which only I have access to. In any case the results of the study are anonymized and kept confidential, and no one outside of the focus group will be able to identify you or the organisation in which you are employed. Pseudonyms will be used in all documentation if needed to ensure privacy. Whilst I do not anticipate that you will experience any distress during the focus group discussions, you will be aware that information that is collected will only be shared if authorization and permission has been granted by you. During the discussion, you have the possibility of refraining from answering questions if you are not comfortable in doing so. Your decision to participate in the study will not be known to anybody other than myself and those participants in the focus group. All information shared and gathered during this time should remain confidential and should not be shared with anyone outside the study or discussed with any participants involved in the focus group after the discussion has been completed. This study is strictly separated from my professional role as the Senior Education Manager to avoid influence and bias towards your participation. Any information that is gathered will not have any bearing on current or future involvement with the organization, and all data collected is utilized solely as a requirement to successfully complete the doctorate program.

If you are unhappy, or if there is a problem, please feel free to contact the Primary Supervisor Dr. Janet Strivens or myself, Karim Waljee and we will try to help.

If you remain unhappy or have a complaint which you feel you cannot come to us with then you should contact the contact the university's Research Participant Advocate. When contacting the Research Participant Advocate, please provide details of the name or description of the study (so that it can be identified), the researcher(s) involved, and the details of the complaint you wish to make.

For any further issues, you can contact me directly at _____.

Kind regards,

Karim Waljee

PARTICIPANT CONSENT FORM

Title of Research Project:	Defining Student Success in the Age of Data and Analytics: A Study in Determining the Essential Skills, Career Readiness, and Employability of Young-Adults in today's Global Knowledge-Based Economy
Researcher(s):	Karim Waljee

Please initial box

1. I confirm that I have read and have understood the information sheet dated _____ for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my rights being affected. In addition, should I not wish to answer any question or questions, I am free to decline.

3. I understand that, under the Data Protection Act, I can at any time ask for access to the information I provide and I can also request the destruction of that information if I wish.

4. I understand that confidentiality and anonymity will be maintained, and it will not be possible to identify me in any publications.

5. I understand and agree that once I submit my data it will become anonymized and I will therefore no longer be able to withdraw my data.

6. I understand that my participation in the focus group discussion that all information shared and gathered during this time should remain confidential and should not be shared with anyone.

7. I agree to take part in the above study.

_____	_____	_____
Participant Name	Date	Signature
_____	_____	_____
Name of Person taking consent	Date	Signature
_____	_____	_____
Researcher	Date	Signature

Appendix D: Interview Questions for Students

Q1. What is your role and what are your major responsibilities?

Q2. What are the top 3 soft skills/attributes that support you in your role?

Q3. What are the top technical skills that support you in your role?

Q4. How important is higher education in relation to gaining employment opportunities?

Q5. What are your thoughts on non-traditional and online education programs and their role in the workplace?

Q6. How do you know you are successful on the job?

Q7. Is there someone who you look up to as a person that is considered successful, what attributes do you think make this person successful?

Q8. What is your personal definition of success?

Appendix E: Interview Questions for Employers

Q1. What are your main responsibilities?

Q2. What are the top 3 skills/attributes that support students in their roles?

Q3. What are the top technical skills that support students in their roles?

Q4. How important is higher education in relation to gaining employment opportunities?

Q5. What are your thoughts on non-traditional and online education programs and their role in the workplace?

Q6. How do students know they are successful? Is there a performance evaluation?

Q7. Is there someone who you look up to as a person that is considered successful? What attributes do you think make this person successful?

Q8. What is your personal definition of success?

Appendix F: Survey Ranking of Skills

SKILL	RANKING
Adaptability	
Asking for Help	
Communication	
Initiative	
Problem Solving	
Receiving Feedback	
Teamwork/Collaboration	
Time Management	
Willingness to Learn	

Appendix G: Questions for Focus Group

Q1. Please rank the skills on the survey sheet you have been provided in order of importance from 1 through 9 that you feel are important for students to succeed in the workplace.

Q2. What do you think about the similarities in responses between employers and students and their perceptions of top skills? How do you feel your answers compare?

Q3. Do we agree with the rankings of soft skills that were provided by students and employers?

Q4. How do you think students in non-traditional programs (such as ours and other online programs) and traditional programs compare with respect to soft skills?

Q5. How do we know our students are successful?

Q6. What are your personal definitions of success?

Q7. Is our current curriculum helping support students we serve toward a pathway to success?

Q8. What are your thoughts on technology's impact on education and student population that we serve?

Appendix H: Focus Group Participant Tracking Sheet

Question #	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
1)					
2)					
3)					
4)					
5)					
6)					
7)					
8)					

Appendix I: Screenshot of Data Analysis for Students using NVivo © Software

Appendix J: Screenshot of Data Analysis for Employers using NVivo © Software

Appendix K: Screenshot of Data Analysis for Staff using NVivo © Software