Bridging the skills gap in the financial industry: Uncovering the skills that banks require in the future world of work

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ABSTRACT

Automation and digital transformation are replacing tasks that are performed by humans, therefore changing the skills that organisations are looking for to cope with the changing environment. The banking industry has also been undergoing this unprecedented change and to meet the challenges that come with the technological advances, they need to improve their skills. This can be realised through education.

Qualitative, exploratory research methods were adopted. Twenty semi-structured, in-depth interviews were conducted with executives and graduates employed by the South African banking industry.

The findings demonstrated that poverty, inequality, poor access to quality education, a lack of soft skills and practical experience, poor curriculum alignment with industry needs as well as how the skills are taught contribute to the skills gap in the South African banking industry. Programming, machine learning, robotics, coding, analytical and quantitative skills, collaboration, communication, problem-solving, social intelligence and agility were identified as critical hard and soft skills of the future. Experiential learning or learning through simulations were identified as some of the teaching methods that could enhance and equip graduates with practical experience and relevant skillsets. Recommendations on the role that industry and institutions of higher learning should play to bridge the skills gap included collaboration between both parties to ensure alignment in academic curriculum with industry needs, having industry experts in academia, vocational training and internal training provided by employers to upskill or reskill their current workforce.

These findings suggest that in order to address the issue of skills gap in South Africa, engagement and collaboration between industry, academia and government will be required. The findings validate the human capital theory which highlights the importance of knowledge in skills development and the contribution of knowledge to the productivity and economic development of the country.

KEYWORDS

Skills Gap, Digital Transformation, Banking Industry, Future of Work, Graduate Unemployment, Higher Education

DECLARATION

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Name: Zanele Ditse

Date: 01 December 2020

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1.1 Introduction

Technology is changing the skills required for work; therefore there is an urgent need to invest in human capital to ensure productivity and economic growth in the technologically-driven economy. To meet the challenges that come with the technological revolution, including job displacements, Hu (2019) argues that humans need to improve their skills. Education plays a critical role in skills development and therefore institutions of higher learning are expected to produce high quality graduates that are ready for the workplace. However, the misalignment in skills that are required by the employers with those that are provided by institutions of higher learning contributes to the high rates of unemployment in South Africa (Oluwajodu, Greyling, Blaauw, & Kleynhans, 2015; Pauw, Bhorat, & Goga, 2006; Pauw, Oosthuizen, & van der Westhuizen, 2008; Reddy, Bhorat, Powell, Visser, & Arends, 2016). This has a negative impact on the competitive advantage, growth and development of the economy. South Africa ranks poorly in terms of digital skills and skills of the future workforce compared with other African counterparts and the rest of the world (World Economic Forum, 2019b). This is partly due to that South Africa is still struggling to meet its educational demand, especially in tertiary institutions (Reddy et al., 2016). The poor education outcomes contribute significantly to the skills gap and in turn, to the high rate of unemployment in the country as employers cannot find the right skills for their organisational demands (Reddy et al., 2016).

Automation, digital transformation and machine learning are replacing tasks that are performed by humans, therefore increasing the demand for high-skilled workers (Minocha, Hristov, & Leahy-Harland, 2018). The technological advances are forcing organisations to change their business models to cope with the changing environment that comes with the fourth industrial revolution (4IR). The banking industry has not been spared from this and has experienced a lot of threats and loss of market share due to new entrants such as the financial technology (FinTech) and big technology (BigTech) companies (Bughin & Van Zeebroeck, 2017). Since banks play a critical role in economic activity, relevant skills that will enable this industry to remain competitive will be critical.

In the South African context, previous studies demonstrated a mismatch between the skills that are provided by African universities and the job requirements for now and the future

(Reddy et al., 2016). This will have serious consequences unless proper alignment between industry requirements and academic curriculum is done. Understanding where the skills gap exists between the institutions of higher education and industry will play a critical role in solving the issue of youth unemployment. Skills gap analysis performed in South African university students, lecturers and employers demonstrated lack of soft skills and workplace readiness amongst graduates when they start in the corporate sector as one of the contributing factors to graduate unemployment (Pauw, Bhorat, & Goga, 2006; Taylor, 2016).

When focusing specifically on the banking industry in South Africa, Oluwajodu et al. (2015) demonstrated that skills shortage, the quality of institutions that graduates attended, and differences in employers and graduates' expectations contributed to the graduate unemployment in this sector. However, there is no empirical evidence on whether the South African labour force in the banking industry has the necessary skills to match its changing demands now and in the future. It is unknown what sort of graduates the banking industry is now looking for to adapt to the dynamic environment and whether the academic institutions are currently providing skills of the calibre required by the industry. It is also unclear what measures the employers in the banking industry are making to upskill their current labour force to cope with the demands to retain market share and contribute to the development and growth of the economy.

1.2 Research problem

The graduate labour force is increasing synergistically with its unemployment rate. Institutions of higher learning are trying to adapt their curriculum to industry needs, however, the gap between skills that are produced at an academic level and those that are required in the market place still exist (Reddy, Bhorat, Powell, Visser & Arends, 2016). This has a negative impact on the business as it will suffer in the absence of the right skills. Previous studies conducted in the South African banking sector demonstrated that skills shortage, the quality of institutions that graduates attended, and differences in employers and graduates' expectations contributed to the graduate unemployment in this sector (Oluwajodu et al., 2015). The South African banking industry is undergoing unprecedented change due to technological advances. This has changed the skills that employers now require to adapt and remain competitive (PwC, 2017b; The World Bank, 2019; Yu, 2013). Understanding specific skills that employers in the banking industry require now and in the future is critical. These findings will inform institutions of higher

learning to align their curriculum design with these needs.

The South African government has committed to improving the education system such that it provides critical skills for the economy and society by 2030. A number of policies aimed at addressing the issue of youth unemployment have been put in place (OECD, 2020a). Proper implementation of relevant policies is of critical importance.

The shift from the labour-driven economy to the technology-driven economy in South Africa resulted in less demand for unskilled labour and changed the skills that employers require to adapt to the technological advances (PwC, 2017b; The World Bank, 2019; Yu, 2013). This puts enormous pressure on the education system to produce quality graduates that can adapt and support the technological transformation for South Africa to gain competitive advantage (Ehlers, 2020; Peters, Jandrić, & Means, 2019). Therefore, upskilling the current workforce and providing graduates with skills are important in the banking sector to cope with the demands of now and the future will play a critical role in the growth and development of the South African economy (World Economic Forum, 2019c). Access to technology in a backdrop of illiteracy, lack of critical thinking, problem solving and other skills that are critical for innovation will not be beneficial, therefore emphasising the urgent need for human capital development and training.

1.3 Research purpose

This study aims to uncover skills that the banking industry requires to adapt to the changing environment that comes with digital transformation (Cuesta, Ruesta, Tuesta, & Urbiola, 2015; PwC, 2017a; Vial, 2019). This study seeks to understand the type of skills that the banking industry now requires to enable them to adapt to the new world of work. These insights will be provided from the employer and the graduates' perspective to assess if there is an alignment in terms of expectation and skillsets. Alignment of the academic curriculum with industry expectations is critical for ensuring that institutions of higher learning produce skills that are required by organisations to enhance their performance and productivity and in turn reduce the levels of youth unemployment in South Africa. In a broader context, proper education and skilling will benefit the productivity and development of the South African economy.

1.4 Academic and business need

Whilst there is a body of literature on the human capital theory, there is limited data on the application of this theory in South Africa in the context of the knowledge economy (Mamabolo & Myres, 2019). This study will address this gap and contribute to the field of economics and human behaviour. A skills gap analysis has been previously performed in South Africa in the STEM industry and a skills framework was developed specific to the African context (Mamabolo & Myres, 2019). This study aims to contribute to this framework by including findings from the banking industry. In addition, whilst the framework was developed from employers and business practitioners' perspectives, this study also included the graduate perspectives as they are mostly affected by the issue of unemployment and skills gap in the country. Their input will add value to literature around this issue.

Findings from this study will also identify skills required to adapt to the future world of work and inform the curriculum design so that it is aligned with industry needs. The South African banking industry is undergoing unprecedented technological advances. As the cornerstone of economic activity and one of the largest employers in the formal sector, upskilling or reskilling of the human capital in this sector is urgently required to cope with the changing demands. Upskilling or reskilling will require a clear understanding of key skills that will be relevant now and in the future, and these are evaluated in this study. This study will also provide insights into measures that employers should take to ensure that their workforce remains competitive in the face of the technological revolution.

1.5 Objectives of the study

The objectives of this study are:

- To investigate why there is a skills gap in the South African banking industry
- To investigate the kind of skills that banks require given the digital transformation in the financial industry?
- To determine the role that institutions of higher learning and industry can play in ensuring proper alignment between the curriculum and industry needs to ensure that they equip graduates with the right skillset to adapt to the jobs of the future

1.6 Scope of the study

This study will focus on employers in the South African banking industry, including

executives and human capital managers and graduates who are employees in the sector, to determine the perceived skills required to meet the banks' changing demands.

1.7 Layout of the research report

Chapter 1 highlights the need to understand and uncover skills required by banks to adapt to the changing environment from the academic and business perspectives and the impact of education on the skills gap. **Chapter 2** provides a literature survey to provide a deeper understanding of factors that contribute to graduate skills gap. The role of the South African education system and its contribution to poor graduate outcomes is discussed in detail. The role of poverty in poor education outcome and in turn high levels of unemployment in South Africa is also reviewed in Chapter 2. The relationship between the graduate skills gap and unemployment is also discussed in Chapter 2. The research questions guided by the gaps observed when doing the literature survey are discussed in **Chapter 3**. The research methodology and study design are discussed in **Chapter 4**. **Chapter 5** presents research findings and emerging themes from the research undertaken. **Chapter 6** discusses the research findings. **Chapter 7** highlights the main research findings, links them to literature, and identifies the literature gaps as areas for future research.

The next chapter gives an overview of the theory and literature review on the skills gap, youth and graduate unemployment and other factors contributing to the skills gap in South Africa.

CHAPTER 2: THEORY AND LITERATURE REVIEW

2.1 Introduction

This chapter aims to give an overview on the skills gap in the South African banking industry. This chapter starts by discussing youth and graduate unemployment, the interlink between poverty and unemployment as well as the role of the South African education in poor education outcomes and skills mismatch, in turn resulting in the staggering levels of unemployment in South Africa. This chapter also discusses the impact of digital divide, digital inequalities and other factors that contribute to or further worsen youth unemployment, especially in the future world of work. Digital transformation in the banking industry, the changing landscape and the emergence of competitors or partners who are non-traditional banks are also highlighted in this chapter. Overall, the literature focuses on the graduate skills gap and its impact in the future world of work, the role that education needs to play to ensure that capable and efficient graduates are available to adapt to the dynamic environment and economic development. The importance of collaboration between institutions of higher learning and industry is also highlighted to ensure proper alignment of relevant skills. The chapter concludes by discussing the theory underpinning this study – The Human Capital Theory.

2.2 Youth unemployment and poverty in South Africa

Youth unemployment is one of the major socio-economic challenges facing South Africa today. The official unemployment rate in the second quarter (Q2) of 2020 was 23.3% (Statistics South Africa, 2020a). The shift from the manufacturing industry which favoured low-skilled workers to the technological-driven economy in South Africa exacerbated the unemployment rate (Pauw et al., 2006, 2008). This shift suggested that low-skilled workers would be disadvantaged where employment is concerned (Pauw et al., 2008). In contrast, this has not been the case in South Africa, as unemployment amongst the skilled labour has been increasing with the country's unemployment rate (Statistics South Africa, 2020a). Unemployment reduces social welfare, productivity, and wastes human capital, especially in the context of the educated and unemployed (Oluwajodu et al., 2015). The education system's inability to produce critical skills to meet industry demands – the "skill mismatch" contributes to youth and graduate unemployment in South Africa.

Poverty is a result of unequal distribution of power and resources –and is a product of South Africa's dark history of apartheid. Unemployment causes poverty and in turn, poverty causes unemployment (Cloete, 2015). The OECD report demonstrated that 11.8% of young people in South Africa are neither in employment nor in education or training (NEET), therefore at a high risk of being socially excluded and lacking skills to come out of poverty or contributing to the economy (OECD, 2020b).

The government has put in place different policies to address the issue of youth unemployment in South Africa, such as the Employment Tax Incentive, the Community Works Programme (CWP) and the B-BBEE Amendment Act (The World Bank, 2019), just to mention a few. However, these policies have not been successful due to the lack of transition from basic to higher learning and government and business failure to identify critical skills required for economic growth and development (Yu, 2013). This demonstrates that the issue of graduate unemployment requires engagement and collaboration between multiple stakeholders. Multiple factors contribute to youth unemployment, and these are discussed in the sections below.

2.3 Graduate unemployment and education in South Africa

The South African labour force has become more educated over time. Access to education, especially post-matric training, is a determining factor for employment (Pauw et al., 2008). However, with the economy transitioning towards technological advances, and the need to be competitive globally, there is a demand for a high-skilled labour force for economic outputs (Pauw et al., 2008; Yu, 2013). However, in contrast with the argument that the unskilled labour force will struggle to find employment, the unemployment amongst graduates is also increasing. Post-secondary or even tertiary training will not suffice if the type of qualification and field of study do not align with the industry or economy demands. This is evidenced by the increase in graduate unemployment (Pauw, Oosthuizen, & van der Westhuizen, 2008).

South Africa has low levels of math literacy and there is an under-supply of graduates from science, technology, engineering and mathematics, which are demanded by employers (Mamabolo & Myres, 2019; Yu, 2013). To increase demand for skilled labour force will involve increasing access to education and resources, improving the quality of education and increasing enrolment and passes of STEM subjects. These are some of the long-term solutions that academia, government, and policymakers should consider to reduce youth unemployment in South Africa.

Education plays a critical role in economic development, provision of critical skills, labour development and poverty alleviation, especially in developing countries (Marimuthu, Arokiasamy, & Ismail, 2009). It is therefore important for the competitiveness of the country. Based on this, it is expected that institutions of higher learning will produce graduates of better quality that will contribute to the development of the economy. Given the dynamic environment in the financial services sector, due to technological transformation, there is enormous pressure on institutions of higher learning to produce quality graduates that will adapt to these changes as they join the labour market. This will be critical to ensure that banks remain competitive and retain market share. In addition, this will be important as new jobs that require skills of the future will be created as others become redundant, forcing low-skilled labour into unemployment (Vives, 2019). South Africa is still struggling to meet its educational demand, especially in institutions for higher education due to infrastructural and financial constraints (Reddy et al., 2016).

Although access to education has increased significantly post-apartheid, the transition from secondary to tertiary institutions, especially universities, is still low. For example, in 2017, 29% of matriculants who wrote the National Senior Certificate (NSC) obtained a bachelors' pass and 30% obtained a diploma pass (Statistics South Africa, 2019a). In addition, inequality and poverty contribute significantly to the low levels of transition from secondary to tertiary education, forcing the youth to drop out of school to seek informal employment. In support of this, the General Household Survey (GHS) conducted in 2017 demonstrated that 47% of graduates with a bachelors' degree or a qualification equivalent to the National Qualification Framework (NQF) level 7 were from wealthy families in comparison with 7% from poorest households (Akoojee & Nkomo, 2007). The quality of basic level education has been shown to contribute to poor performance at tertiary institutions (Pauw et al., 2006, 2008; Yu, 2013), highlighting the need to address the skills gap at the basic or primary level of education.

Institutions of higher learning are trying to adapt their curriculum to changing needs. However, the gap between skills that are produced at South African academic institutions and those that are required in the market place still exist (Oluwajodu et al., 2015; Reddy et al., 2016; Yu, 2013) and this needs to be addressed at both the institutional and industry level. The WEF report demonstrates that the majority of skills required today will not be required in the future (World Economic Forum, 2019b). It is therefore critical that institutions of learning adjust their curriculum to adapt to the changing environment. With regards to access to tertiary education, since the year 2000, the area which has shown

greatest enrolments and graduation has been the business, economics, and management studies whereas the least enrolments have been observed in computer and information sciences followed by healthcare studies (Statistics South Africa, 2019a). Graduation in fields with lower employment prospects has been observed and this is a major issue. This highlights the gap in mentorship, early career guidance or even the scope and quality of career guidance provided to ensure that students choose subjects that will secure employment (Oluwajodu et al., 2015; Pauw et al., 2008; Yu, 2013). The graduate labour force is increasing at the same rate as the unemployment rate amongst graduates. Data from Statistics South Africa (2019b) demonstrated an unemployment rate of 43.2% amongst graduates and the majority of them being new entrants in the market. This will have a big impact unless there is a collaboration between institutions of higher learning and the private sector to facilitate skills development and reskilling (Mamabolo & Myres, 2019).

The issue of graduate unemployment, therefore is related to skills shortage and poor quality of graduates rather than supply (Pauw, Bhorat, & Goga, 2006; Taylor, 2016). Previous studies conducted amongst South African university students, lecturers and employers demonstrated inadequate development of soft skills and workplace readiness amongst graduates when they start in the corporate sector (Pauw, Bhorat, & Goga, 2006; Taylor, 2016).

2.4 Factors contributing to graduate unemployment

The technological revolution has changed the skills that are required by employers. These technological advances have resulted in the automation of some occupations and, in turn, job displacements, especially for low-skilled workers (The World Bank, 2019). This has resulted in high demand for skills that cannot be automated, such as collaboration, teamwork, decision-making, and agility. Soft skills such as leadership, communication, collaboration and teamwork were shown to correlate with organisational productivity and performance (Essex, Subramanian, & Gunasekaran, 2016). These play a crucial role in adapting to the organisation's culture and are one of the major bottlenecks in transitioning from the tertiary/academic environment to the workplace.

A CEO survey conducted by PwC in 2018 demonstrated that 75% of executives were concerned about the shortage of digital skills in financial services. In addition, this survey demonstrated that 91% of CEOs within the financial services emphasised the need to develop soft skills. Similarly, a study in the South African banking industry also

demonstrated a lack of emotional and social intelligence as factors that contribute to the sector's high unemployment rate (Oluwajodu et al., 2015). This highlights the need to develop and integrate soft skills into the academic curriculum.

In addition, previous work experience has also been shown to correlate with potential for future employment (Oluwajodu et al., 2015). This suggests that finding a job is critical for one's future of employment as most employers prefer candidates with some work experience. They perceive the return of hiring a graduate as low since they still require on-the-job training before they can provide value to the organisation (Pauw et al., 2008). Vocational training which may bridge this gap is not provided as part of academic training, especially at universities, which further exacerbates this problem. Furthermore, lack of networks, mentorship and early career guidance have been identified as some of the factors contributing to the high levels of youth and graduate unemployment (Graham & Mlatsheni, 2015; Minocha et al., 2018; Yu, 2013). To tackle the issue of graduate unemployment, a thorough understanding of these factors will be required.

2.5 Digital divide and digital inequality in South Africa

According to the Global Employment Trends for Youth report (2020), younger people are more likely to use the internet or own a smart device compared with older people. The same report demonstrated lower access in technology from youth in developing countries compared with the developed countries (ILO, 2020). Although digital uptake is increasing in South Africa, access to the internet is still low due to structural factors such as poverty and inequality. According to Stats SA, approximately 60% of South Africans were internet users in 2020 due to an increase in mobile device usage, suggesting an increase in internet penetration. However, when focusing on individuals that have a connection in their households, this number is reduced to 9.5% of the population (Oyedemi, 2012). Similarly, a study conducted amongst South African university students demonstrated that majority of students access publicly available internet on campuses and household internet access is still a major challenge as 63% of South African university students do not have internet access at home and the few that do connect through the use of mobile phones from data providers, which is an expensive exercise (Oyedemi, 2012).

Economic and social exclusion is a major challenge in South Africa, and the digital inequalities exacerbate the existing social inequalities. This prevents youth from enhancing their digital skills and participating effectively in a society that is moving towards a technologically-led economy and, therefore, puts them at a disadvantage of being

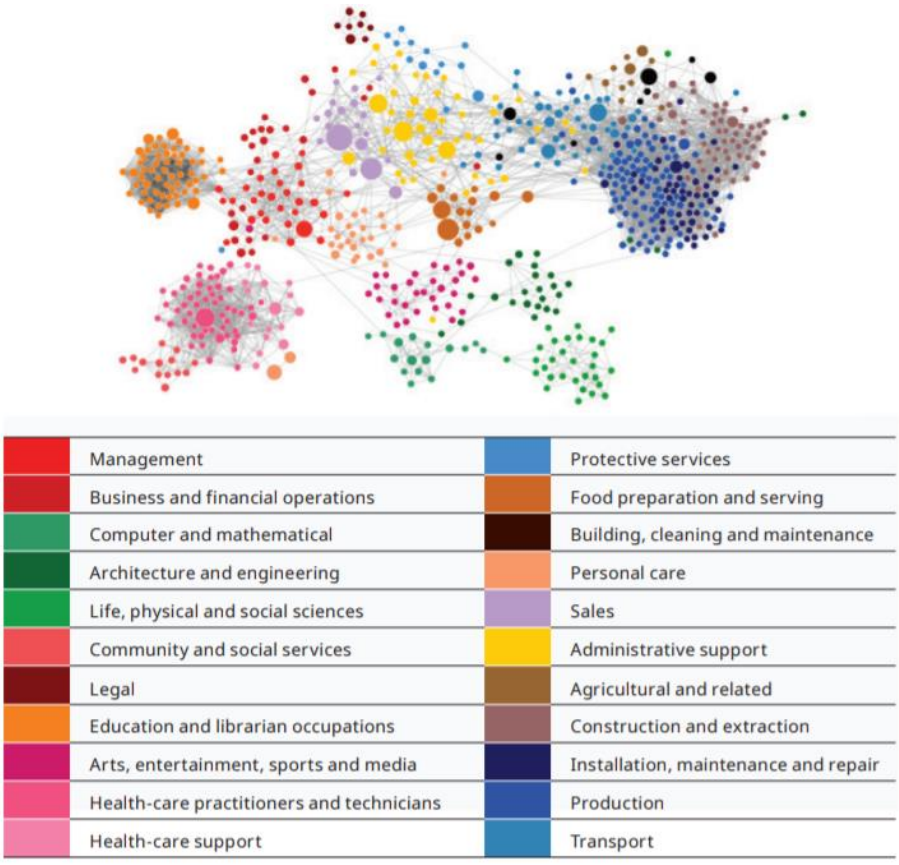
considered by employers for in the future world of work (Choung & Manamela, 2018). Oyedemi (2012) demonstrated that access to technology was associated with the level of education, gender, class, wealth, geographic location and ethnicity. This suggests a direct relationship between digital inequalities, education and poverty and suggests an urgent need to deal with this issue if the country wants high-skilled youth to participate in the technological-led economic development.

Digital access and early exposure to technology enhance digital skills required in the new world of work. In addition, this allows for access to information related to education. This demonstrated a direct role of poverty and inequality to unemployment as youth from disadvantaged backgrounds will continue being in the poverty trap due to the lack of critical skills required for the jobs of the future. Previous studies performed on South African high school learners demonstrated that 5% had frequent access to the internet, whereas 73% had very limited information about the internet (Choung & Manamela, 2018). To ensure the development of human capital, social inclusion and the development of key skills for the future, the issue of the digital divide of technology inequality needs to be addressed urgently.

2.6 New world of work and jobs of the future

Technological advances in the digital age present youth with both opportunities and challenges. Although many jobs will become obsolete due to automation, this will create opportunities for new jobs that did not exist previously. Unfortunately, academic institutions have not kept up with the technological pace that came with the technological revolution. In a survey performed by McKinsey and Company (2017) on young people and employers across 90 countries, 60% of employers stated that new graduates were not adequately prepared for the workplace, identified gaps in STEM skills and lack of soft skills as a major bottleneck to employability (McKinsey and Company, 2017). In addition, Frey and Osborne (2017) calculated the distribution of jobs or skills that are at a risk of automation as shown in **Figure 2-1**. From the illustration, it is evident that the majority of occupations in construction, maintenance, production and transportation, to name a few are at a high risk of automation. In contrast, very few occupations in business and finance, computer sciences, engineering, mathematical, social and life sciences are at a high risk of automation (Frey & Osborne, 2017; The World Bank, 2019). This suggests that the education system needs to evolve at the same pace to prepare graduates for the changing world of work, improve STEM skills and integrate social sciences and humanities into

every stream of the curriculum to enhance soft skills. Emphasis should be put on integrating technology based subjects to empower the youth to adapt to the technological-led new world of work.



Source: Nedelkoska, Diodato and Neffke, 2018, using O*NET data.

Figure 2-1: Occupations that are at a high risk of automation. The jobs that are at a higher risk of automation are shown in darker and bigger circles. distribution of jobs that are at a risk of automation

The future of world is changing the way work is done and the skillset required to perform functions. Some of the skills that will be in demand in the near future include analytical thinking, innovation, critical thinking, emotional intelligence and leadership (World Economic Forum, 2019a). This is in line with a skills gap analysis done in South Africa in the STEAM industry (Mamabolo & Myres, 2019). This study demonstrated that a combination of soft, hard and meta skills is critical for workplace preparedness. It remains to be established which soft, hard and meta skills are required in the banking sector now and in the future, from both the employer and graduate perspectives, to adapt to the new

world of work. The findings on the skills gap in the South African STEAM industry could be used to inform the industry, academic institutions and various stakeholders so that there is proper alignment between the academic curriculum and industry expectations. This study developed a skills framework that is suitable for the African context focusing in one industry. Our study has contributed to this framework by expanding findings from the banking industry perspective.

2..7 Teaching methodologies

The “jobs of the future” or “the future world of work” suggest that part of tailoring the curriculum to meet the dynamic industry needs will also require re-evaluation of the Socratic learning methods. The teaching methodologies should be designed to align with industry expectations and provide graduates with the relevant skillset to adapt to the digital world at institutions of higher learning to fit the current context. This can be achieved by integrating experimental and practical methods such as learning through simulations or using the flipped classroom approach (Hussin, 2018).

2.8 The digital landscape in the banking industry

The bank’s main functions include receiving deposits, providing loans and investment. They also play a role in matching surplus and deficit units within a country. The South African banking sector plays a critical role in the economic framework of the country. It contributes 20 percent towards GDP and is one of the largest formal employers in the country. A direct relationship has been demonstrated between the performance of a bank and the economic wellbeing of the country (Greenberg & Simbanegavi, 2009). South Africa is ranked amongst the top countries for financial services and meeting business demands (World Economic Forum, 2019b). Since banks are the main contributor to the economy, increasing productivity and creating an economic environment which integrates new technologies and business models will be critical for improving South Africa’s competitiveness.

Digitisation is converting physical or manual activities into digital processes and digital transformation when an organisation uses digital technologies to offer value to their customers (Verhoef et al., 2021; Vial, 2019). Digital technologies are tools that organisations use to interact with their customers to transform the way they run their businesses. These include cloud computing, Internet of Things (IoT), social media, robotics, mobile, analytics (Dery, Sebastian, & van der Meulen, 2017). Digital technologies

have altered the banking landscape and blurred the traditional lines that define the product, market and consumers. New technologies have entered to disrupt the retail financial services and introduced new entrants in the financial services industry. Due to legacy systems and bureaucracy, banks have been using old systems of complex and centralized technology. Although banks have been in existence for centuries and have a higher customer base than the new entrants, they have been collecting data for decades. However, the inefficient use of these data has put them at the backfoot for technological advances (Cuesta et al., 2015).

The retail area of banking is mostly impacted by digitisation. For example, some of the management functions are now performed by robots through the use of artificial intelligence (AI), replacing certain functions that were traditionally performed by risk managers. Through the use of AI, robots are now performing functions previously done by consultants (Omarini, 2017; Vives, 2019). For traditional banks to remain competitive and adapt, they need to diverse their product offering and/or consider vertical product differentiation (Louw & Nieuwenhuizen, 2020). **Figure 2-2** demonstrates the evolving landscape of the financial services industry. Digitisation has offered new ways of putting customers at the centre of the development process (PwC, 2017a; Verhoef et al., 2021; Vial, 2019). This has provided services through the use of online channels or mobile phones, banking convenience to consumers who do not wait to wait in long queues and transact anywhere in the world. However, importantly, this also reduced costs that are associated with establishing and maintaining a physical bank (Louw & Nieuwenhuizen, 2020).

The use of technology in the financial services sector has increased with digitisation and machine learning (Minocha et al., 2018). Innovation that comes with the digital era has put pressure on the banking industry to transform their business models from focusing on provision of products to moving towards a customer-centric approach aimed at solving clients problems (Vives, 2019). Introduction of new products and technologies will create new job opportunities, requiring new sets of skills or upskilling to cater to the new demands (Goran, Laberge, & Srinivasan, 2017; Vives, 2019). Low-level jobs are the ones that will be mostly affected by digital transformation especially administrative, data entry and teller jobs (Vives, 2019).

Access to mobile phones and penetration of the internet has increased access to financial services, especially for people in less developed countries and small-to-medium

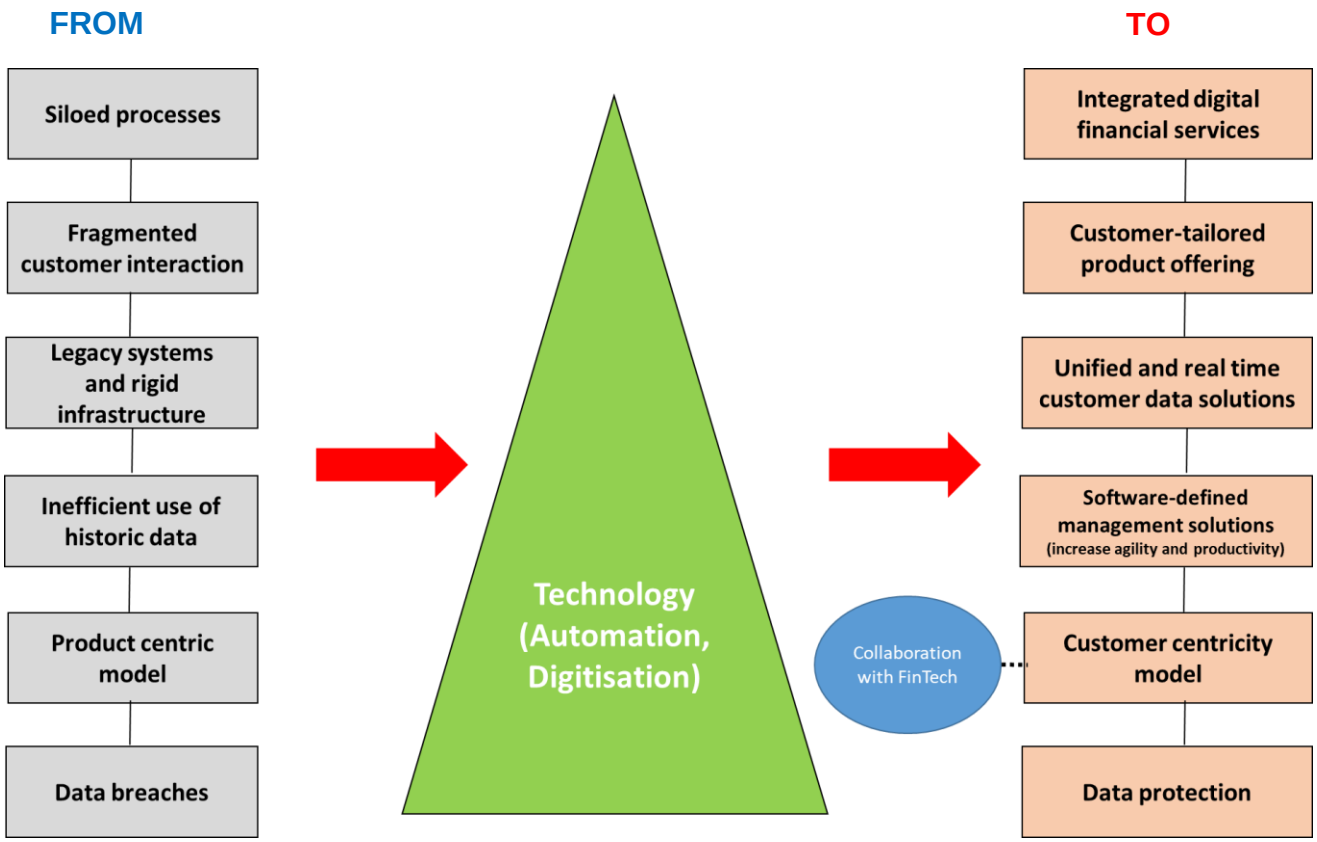
enterprises who could not access capital due to a lack of audited accounts (Vives, 2019). Innovation in the banking industry has also led to a reduction of cost since services can be accessed through the use of a smartphone device instead of physical infrastructure such as branches. In addition, to improve customer experience and efficiency, the financial technology platforms also use big data to match customers with sellers and screen and approve loan applicants by monitoring their search activities (Vives, 2019). These innovations provide customer-oriented services that were previously not catered for by traditional banks, therefore intensifying competition with the banks (Vives, 2019).

Cloud computing has been used extensively for customer relationship management, financial accounting and human resource management. Humans have previously performed these roles; therefore, this suggests that employers need to reskill their workforce, particularly in these areas. Since FinTech or BigTech companies' core competencies are technology and data, they can work in partnership with the incumbents traditional banks by bundling their services with banking products to offer more value to customers, making them the banks' most powerful competitors (Vives, 2019). To compete with these new entrants, banks will need to either integrate similar services offered by FinTech and BigTech companies or be more innovative to maintain market power, which has been the case in some of the South African banks (Vives, 2019). Collaboration with FinTech and BigTech companies or integration of similar services will require banks to have a competent and skilled human capital to adapt to these changing demands.

Furthermore, automation through the use of robotics and artificial intelligence results in efficiency, safety, convenience and high productivity, and in turn, economic growth (McKinsey and Company, 2017). However, the challenge that comes with automation is the impact on jobs, skills and the nature of work itself, as many functions performed by workers have the potential to be automated (Frey & Osborne, 2017). Most jobs that are at a high risk of automation are performed by low-skilled workers (Frey & Osborne, 2017), to eliminate job displacement, low-skilled workers will need to be reskilled in other occupations.

According to the global competitive index, South Africa is ranked at position 60th out of 141 countries. This measure is important since it reflects the level of productivity, growth and human development in each country (World Economic Forum, 2019b). South Africa also ranks number 19 and 46 in financial systems and innovation capacity, respectively. However, when focusing on digital skills amongst the active population and skills of future

workforce, South Africa ranks poorest at 106 and 127 out of 141 countries (World Economic Forum, 2019b). Since the financial industry, banks particularly, is the cornerstone of economic activity and one of the formal sector's largest employers. To remain productive and competitive, especially in the technology-driven economy, South Africa needs to invest in human capital development to ensure that they have adequate skillsets to support the ongoing technological changes in the banking industry.



Adapted and modified from BCX (2020). The future of financial services.

Figure 2-2: The evolving landscape of the banking industry**.** The banking industry is moving from their legacy systems and rigid infrastructure to improve customer experience and convenience through integration and implementation of technology into their systems and processes..

2.9 The impact of non-traditional players on the banking industry – Friends or foes?

The increase in digitisation resulted in the growth of non-traditional players challenging the incumbents and changing South African financial services' landscape. The PwC report demonstrated that one of the dominant trends in the banking industry in 2020 is the rise in FinTechs (PwC, 2020). They have entered the financial services industry and provide services directly to consumers and businesses, including banks. FinTechs have different competitive frameworks, regulation and technological development pace. They specialize mostly in mobile payments or transfers startups, alternative lending or funding, automated financial service advice and crowdfunding, to name a few (Omarini, 2017; Vives, 2019). Unlike traditional banks that suffer from bureaucracy, tight regulations, legacy technology and systems, FinTechs are spared for this as they have unbundled their products and services and have avoided the high barriers to entry of being a bank. They are highly specialized in terms of technology, hence improving customer banking experience and convenience (Omarini, 2017).

The entrance of FinTech into the financial services industry suggests that banks need to rethink their strategy to remain competitive. To cope with the threat from new entrants, traditional banks are also prioritising digital transformation and the use of data to understand consumer behavior. The experience curve and strong customer base give the incumbents an added advantage; however, they would have to develop analytical capabilities to meet consumers' increasing demands (PwC, 2017a). Strategic partnerships are some of the measures that banks are taking and these partnerships have been mutually beneficial (Goldstein, Jiang, & Karolyi, 2019; PwC, 2020). South African banks have been investing massively in local FinTech startups. This relationship will require integrating the innovations by FinTechs into the banks' main architecture and operations (Omarini, 2017; Vives, 2019).

The future of the banking landscape will be shaped by digital technology and partnerships with non-traditional players to provide a better experience at a low cost (Omarini, 2017; PwC, 2017a), as highlighted in **Figure 2-2**.

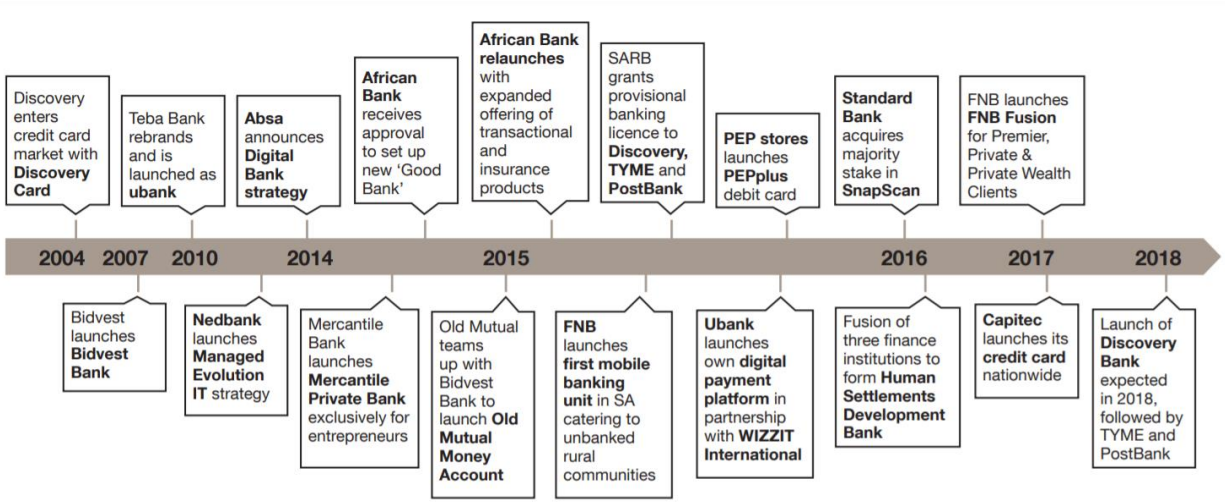


Figure 2.2: The face the South African banking industry. Source (PwC, 2017a)

Digital banks launch new and affordable products into the market because of low running costs. They outsource most of their functions to partners with existing infrastructure and wide reach, such as supermarkets and traditional banks (Louw & Nieuwenhuizen, 2020). FinTechs however, will never "eat the banks' lunch" as they still need banks to access deposits and consumer data, access payment systems and credit data. Technology alone will not be sufficient in disrupting the financial services; however, integration and implementation of it will (Omarini, 2017) – this suggests that a collaborative relationship between the incumbents and the new entrants will be critical for enhancing customer experience.

2.10 The Human Capital Theory

The Human Capital Theory (Becker, 1964) states that education and employability result in human capital outputs such as knowledge and skills. The principles underlying this theory are that gains in education and training are an investment and key pillars of social and economic development for any country (Becker, 1964, 1993; Cohn & Geske, 1990). The theory further states that processes that involve education and training that the organisation engages in improve the organisation's financial performance and competitive advantage (Marimuthu et al., 2009). The framework of the human capital theory and the relationship between components of the theory are show in **Figure 2-3.** The human capital theory suggests that quality education and training coupled with proper alignment of skills provided by the institutions of education with those required by the employer are critical for productivity, growth, and development of the organisation and the entire economy in a broader context.

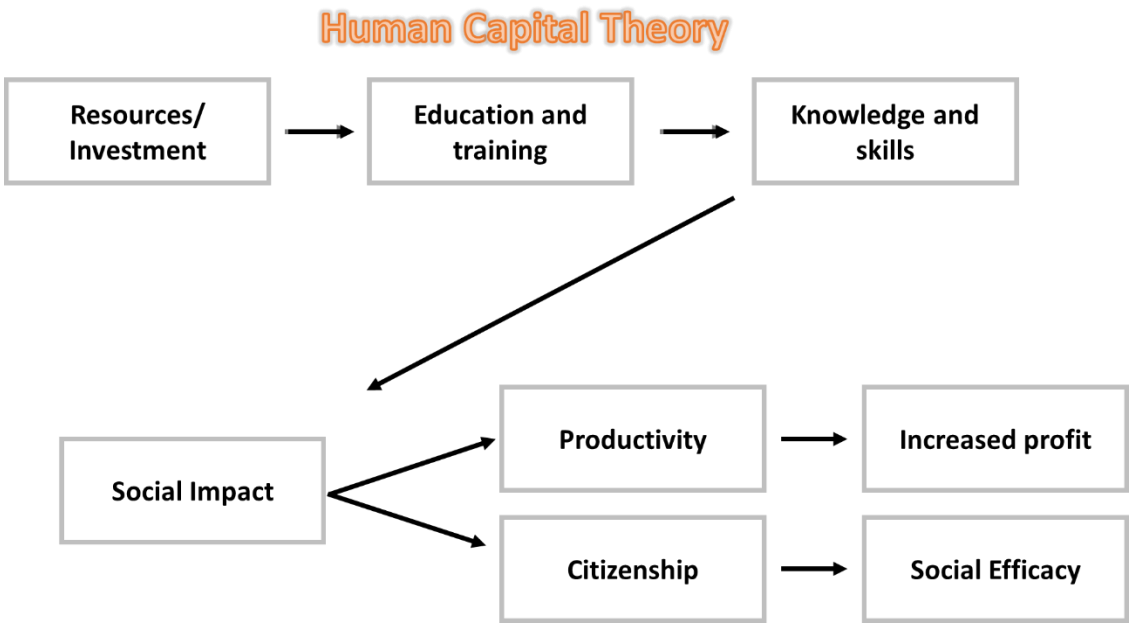


Figure 2-3: The Human Capital Theoretical framework used in this study.

Based on this theory, the role of education in providing skills that the banking industry requires for the future world of work was assessed in this study. Focusing specifically on the banking industry, what skills do employers require to adapt to the unprecedented change for now and in the future, what do they identify as a skills gap in the industry, what role can they play to bridge tis gap, especially in the context of the 4IR which requires this industry to transform to maintain its competitive advantage and contribute to economic growth.

Although factors contributing to the graduate unemployment in the South African banking industry have been previously assessed (Oluwajodu et al., 2015), specific skills that employers in the banking sector are now looking for to adapt to the technological advances have not been explored. This is one of the gaps that were addressed in this study. In addition, this study also determined how the banking industry is responding to the change in skills demand and how they are equipping their employees to adapt to the dynamic environment in the financial industry.

2.11 Conclusion

The literature review argues that institutions of higher education need to align their curriculum with industry expectations to produce relevant skills. This alignment is even more critical now with data showing that the majority of skills will become redundant in the near future. The banking industry has been affected tremendously by the new digital entrants. The banking industry plays a critical role in the economy and is one of the major

employers in the formal sector. Threats to this environment will impact a number of employees and further raise the levels of unemployment in the country. Education and training should produce graduates with quality skills that will enable the industry to remain competitive and these are the underlying principles of human capital theory.

The government has committed through the National Development Plan and the Sustainable Development Goals (SDGs), SDG 4 in particular, that the South African educational system should be able to provide skills that are critical for the economy and society by 2030. Vocational training and education prepare youth for the work environment and equip them with the right skillset required to adapt to the world of work. Information and communications technology skills are some of the top skills that are perceived to be critical to adapt to the digital age that comes with 4IR (ILO, 2020). Unless this plan is successfully implemented, bearing in mind the critical factors discussed above that contribute to high levels of unemployment, South Africa's economic development will remain a vision.

Importantly, upskilling the current workforce and providing graduates with skills that will be important in the banking sector to cope with the future demands will play a critical role in the growth and development of the South African economy. Access to technology in a backdrop of illiteracy, lack of critical thinking, problem solving and other skills that are critical for innovation will not be beneficial, therefore emphasising the urgent need for human capital development and training. The literature highlights the gaps in the South African education system and its contribution to the high levels of unemployment in South Africa. The literature review highlights the misalignment between the skills taught at the institutions of higher learning and those required by potential employers. It also emphasises the need to identify the gaps to enable proper alignment to solve the issue of graduate unemployment. The question of the skills gap in the banking industry is critical, as stated in the discussions above. The question is, what skills does the banking industry require to adapt to the changing demands, especially in the context of the 4IR? Are the institutions of higher learning teaching these skills, and if not, how will this be addressed?

CHAPTER 3: RESEARCH QUESTIONS

3.1 Introduction

The literature review in Chapter 2 identified gaps in literature regarding skills that the banking industry requires to meet the changing demands that come with technological transformation. The following questions were then formulated to help the researcher address these gaps. Answers to these questions will help institutions of higher learning identify skills that they should be focusing on to churn out graduates that are ready for the current and future world of work. In addition, institutions of higher learning will also re-evaluate their teaching methodologies and curriculum design to see if it still relevant in the context of industry needs. Furthermore, these questions will help the banking industry identify the critical skills required to support the technological revolution.

The research questions that this study aimed to address were:

3.2 Research Question 1

Why is there a skills gap in the South African banking industry?

Studies by Oluwajodu et al. (2015) conducted amongst graduates and employers within the South African banking industry demonstrated that skills shortage, differences in the expectations between employers and graduates, and the quality of institutions that graduates attended contribute to graduate unemployment. Research question 1 aims to address the gap in the literature by identifying specific factors that contribute to the skills gap in the South African banking industry. This research question will also evaluate the current skillset that the employees possess in relation to that required by employees and identify where the gap is between the two.

.3.3 Research Question 2

Which key skills should graduates possess to navigate the technological advances in the banking industry

The technological advances that came with 4IR have changed the type of skills that employers are now looking for. While some studies have assessed the skills gap in South Africa in other industries (Mamabolo & Myres, 2019), there is limited data on the skills gap analysis in the South African banking industry, especially in the context of the technological revolution. Research question 2 aims to identify specific skills that the

banking industry requires to cope with the dynamic environment now and in the future.

3.4 Research Question 3

How is the financial industry responding to the change in skills required for the future world of work?

Graduate unemployment has been increasing significantly in South Africa, with an unemployment rate of 43.2% in the first quarter of 2020 (Statistics South Africa, 2020b). This contrasts the notion that the unskilled labour force is the one that will struggle to find employment since the country is transitioning towards a technologically driven economy (Pauw et al., 2006, 2008). This suggests that matric or even tertiary training will not be sufficient if the skills supplied by institutions of higher learning do not match those required by the industry. This is further supported by Reddy et al. (2016), who demonstrated a mismatch between the skills that are provided by African universities and those required by the industry now and in the future. Research question 3 aims to provide insight into the banking industry's measures to cope with the technological changes.

3.5 Research Question 4

How can institutions of higher education develop and enhance future skills that are required by the workplace?

The McKinsey survey and other studies amongst graduates and employers identified inadequate STEM skills and lack of soft skills as some of the major bottlenecks to employability (Mamabolo & Myres, 2019; McKinsey and Company, 2017; Oluwajodu et al., 2015). In addition, Frey and Osborne (2017) provided an analysis on occupations that are at risk of automation, suggesting that the education system needs to evolve at the same pace to prepare graduates for the changing world of work. Research question 4 aims to provide insight into measures that institutions of higher learning and industry (alone or in partnership) are taking to reduce the skills gap in the banking industry. Importantly, recommendations from the perspectives of both graduates and employers were shared to tackle the issue of the skills gap in this industry.

3.6 Conclusion

This chapter presented research questions that guided this study. Insights from these questions will critical in understanding where the skills gap in the banking industry is, what the employers are doing to ensure that they remain competitive, given the context of the technological revolution. Importantly, answers to these questions and recommendations

will ensure that the curriculum design is aligned with industry needs to produce an effective workforce that will be crucial for developing the South African economy. The next chapter will describe the research methodology and design that was employed in this study.

CHAPTER 4: RESEARCH METHODOLOGY AND DESIGN

4.1 Introduction

This chapter focuses on the research methodology and design that was employed in this study to answer research questions presented in Chapter 3. The study design was based on insights provided by the literature survey, and the interview guide was also developed on this basis to address gaps in the literature. The study population, size, and unit of analysis that helped the researcher in addressing the study questions are defined in this chapter. The sampling method, data gathering process and measurement instruments that were used are also discussed in detail. The chapter concludes by describing measures used to ensure that the data is reliable and valid and discusses the limitations of the study.

4.2 Research methodology and design

Qualitative, exploratory research methodology enables the researcher to gain insight in an under-explored research area (Saunders & Lewis, 2018). This approach is ideal for gaining the study participants' perspective in their natural setting and provides an in-depth understanding of a particular issue (Creswell, Hanson, Clark Plano, & Morales, 2007; Saunders & Lewis, 2018). The skillset that the South African banking industry is now looking for to adapt to the technological revolution is under-researched and therefore warrants further investigation. Exploratory research is not aimed at providing definite evidence but rather insight based on the participant's perspective, therefore eliminating researcher's bias (Bryman & Bell, 2011). This approach then enabled the investigator to gain insights into skills that are required by the banking industry to meet its changing demands. Skills that the banking industry now requires were explored from different perspectives including those of the employers (executives and human capital managers) and graduates who are employed by the bank.

This study followed the interpretivism philosophy. This philosophy is applied when the researcher seeks to understand individual's experiences; therefore, this approach is highly subjective. Interpretivism is key for understanding differences between humans as social factors (Saunders & Lewis, 2018). The skills that are required by the financial industry now and in the future were assessed from the perspectives of different individuals who provided their personal views. An inductive approach was used as it involves a bottom-up approach to building theory by analysing data that has already been collected and allows for the emergence of potential patterns that lead to the formulation of a general theory

(Patton, 1992). Theory is built from observations or analysis of data collected from the research questions, which in turn allows for drawing generalisable inferences or conclusions (Bryman & Bell, 2011). Data was collected cross-sectionally. This approach gives a snapshot of a particular research setting at a particular point in time (Saunders & Lewis, 2018), therefore, interviews with the target population were conducted at a single time point.

4.3 Study population and unit of analysis

The study population is everyone from whom the samples will be drawn from and whom research will be conducted on (Saunders & Lewis, 2018). Given that the overall aim of this study was to identify the skills that are required by banks from the employer and graduate perspectives, the study population comprised of Chief Information Officers, Chief Executive Officers, Chief Digital Officers, Human Capital Managers, Heads of Business Units, Heads of Technology and other digital specialists within the banks, as well as graduates in the South African banking sector. Human Capital Managers were selected based on their role in the recruitment and training of graduates. The study population was selected from the traditional major banks and one entrant digital bank. Digital consulting firms who provide technological support and drive digital transformation in the banking sector were also included in the study. South African banks were chosen because they are the cornerstone to the country's economic activity and are the largest employer in the formal sector. Importantly, they are also undergoing unprecedented change due to the technological revolution.

In this study, the unit of analysis was the individual perceptions of the executives and graduates who are employed by the banking sector in Gauteng. This sample provided the researcher with a holistic view and insights into the skills required by the banking industry to meet its changing demands compared with skills provided by higher learning institutions in South Africa.

4.4 Sampling method and size

Purposive, non-probability sampling was used in this study. This sampling method allowed the researcher to use her judgement to select study participants according to preselected criteria that enabled the researcher to answer the study's research questions and objectives (Saunders & Lewis, 2018). Executives were selected by means of purposive non-probability sampling and graduates were selected through snowballing techniques by means of referrals from the sample selected (Saunders & Lewis, 2018). A total of 20 interviews were conducted whereby 10 interviews were conducted with executives, heads

of business units or employers and the remaining 10 interviews were conducted with the graduates employed by the financial industry as shown in **Table4-1**.

Table 4-1: Sample population

	Company	Level	Role	Experience in current role or industry
Executives				
A	BANK 1	Senior/Executive	Chairman, board member	16
B	IT CONSULTING FIRM 1	Senior/Executive	Director	>10
C	BANK 2	Senior/Executive	Human Capital Manager	14
D	BANK 3	Senior/Executive	Chief Information Officer	>10
E	BANK 5	Senior/Executive	Software Developer/Platform Lead	9
F	BANK 4	Senior/Executive	Head of Digital Fraud and Governance	2
G	BANK 2	Senior/Executive	Chief Information Officer/Head of Digital Transformation	>10
H	BANK 4	Senior/Executive	Head of Fraud Stategy and Support	4
I	BANK 6	Middle	Governance	2
J	IT CONSULTING FIRM 1	Senior/Executive	Director	2
Graduates				
A	BANK 3	Graduate	Software Developer/ Team Lead	4 years, joined post completion of the graduate recruitment programme
B	BANK 5	Graduate	Data Analyst	3
C	BANK 2	Graduate	Quantitative/Risk Analyst	4 months
D	BANK 2	Graduate	Financial Analyst	1 month, joined post completion of the graduate recruitment programme
E	IT CONSULTING FIRM 1	Graduate	Risk Analyst	1
F	BANK 2	Graduate	Human Capital Graduate	7 months
G	IT CONSULTING FIRM 1	Graduate	Software Analyst	2 month, joined post completion of the intership with current employer
H	BANK 4	Graduate	Business Assurance Specialist- Digital Fraud	2
I	IT CONSULTING FIRM 1	Graduate	Financial Analyst	currently in internship
J	BANK 5	Graduate	IT Systems Analyst	10 months

The sample size was influenced by data saturation – the point at which no new codes or information emerge (Creswell et al., 2007). **Figure 4-1** shows a visual description of new codes that emerged from each interview. Data saturation was reached between interview 7 and 8. Since there were minor differences in the interview questions that were asked to both executives and graduates, the sample was pooled for this analysis.

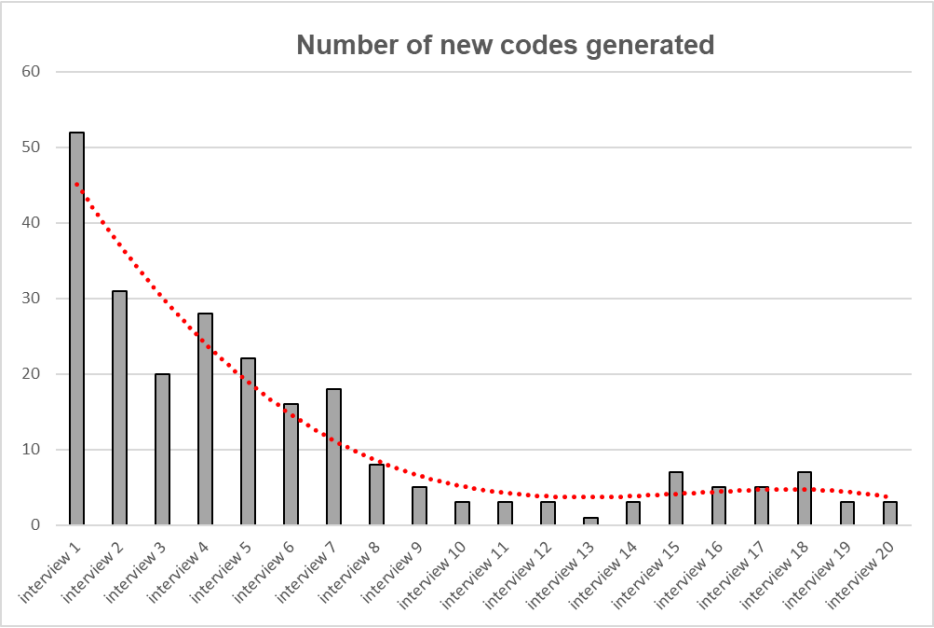


Figure 4-1: Demonstration of data saturation

Each bar shows the new codes that were generate for each interview and the dotted line shows the decline in new codes as the interviews progressed.

4.5 Data collection

A mono-method, face-to-face, in-depth semi-structured interviews was used in this study. In-depth semi-structured interviews are ideal for exploring the perspective on a particular idea. It is useful when a researcher wants to obtain detailed information about a particular issue. It allows the researcher to ask questions out of sequence and introduce spontaneous questions, therefore providing depth to a specific topic (Saunders & Lewis, 2018). This approach was useful in understanding the employers' and graduates perspectives on what skills they think the banking industry requires given its dynamic environment (Saunders & Lewis, 2018).

The measurement instrument was designed to ensure that it considers all the research questions and these were informed by literature. Separate interview guides for graduates and executives shown in **Appendix 3 and 4** were developed and utilised whereby open-ended and non-leading questions were asked allowing study participants to give their personal experience and opinion. The research instruments that were used for this study included the interview guide, a digital recorder, a pen and paper for taking notes. The interview instrument was tested and calibrated on the first participant. The purpose of calibration was to ensure that framing of the questions elicited the right responses and that the participant understood all the research questions without ambiguity. This process also allowed the researcher to pace herself and utilise open-ended questioning where

some of the responses were closed. Following this process, the measurement instrument was deemed acceptable.

Ethical clearance (**Appendix 5)** was obtained and consent forms (**Appendix 2**) were given to study participants prior the interview process to ensure that the researcher adheres to ethical standards when conducting research (Saunders & Lewis, 2018). Interview requests were sent using the electronic mail. The interview duration ranged from 40 minutes to an hour and interviews were conducted using either Zoom or Microsoft Teams. Open-ended questions were asked to enable participants to provide insight into specific skills required by the financial industry from their own perspective (Cassell, 2015; Saunders & Lewis, 2018). The order in which questions were asked varied depending on the respondent's feedback and this flexibility is one of the advantages of semi-structured interviews. Further questions were asked to provide clarity and to enrich the quality of data collected.

4.6 Data analysis

Audio recordings were sent for transcription and to uphold the level of confidentiality, the transcriber signed a confidentiality agreement attached in **Appendix 6**. Transcripts were assessed for accuracy and completeness by the researcher. This process also enabled the researcher to get a broader view and understanding of meanings, relationships and themes from the transcripts. Part of the iterative process inherent in analysing qualitative data requires revisiting the original data during the data analysis stage to ensure that the analysis is in line with the recorded data (Bryman & Bell, 2011).

Transcripts were loaded and analysed using the Atlas TI software for qualitative data analysis. Codes were formulated as short phrases that captured portions of data in each transcript. A codebook containing a list of codes that were produced in this study is shown in **Appendix 7**. The codes were then grouped into categories and related codes were then grouped into categories. Categories were labelled and themes emerged from these categories. Themes were then analysed to look for specific patterns of new insights for theory building (Saldana, 2009). Frequency analysis was performed to count each time a construct was identified and repeated. Data was then ranked and presented as frequency tables (Clarke & Braun, 2013; Saldana, 2009).

4.7 Reliability and validity

Data was assessed for accuracy or validity, trustworthiness and bias. To ensure trustworthiness, data was tested for credibility, transferability, dependability and

confirmability. To ensure validity in data, the researcher conducted interviews in a language that is understood by the study participants. The reliability and validity of the measurement instrument was ensured by standardising data collection techniques and protocols. Briefly, the researcher used the same interview guide for executives and similarly for graduates. Interviews were recorded using a recorder in addition to notes taken by the researcher during the interview process to limit researcher bias and ensure accuracy.

4.8 Limitations

Qualitative research is subjective in nature and can be affected by different biases including interviewer and response bias (Saunders & Lewis, 2018) and these were expected in this study. Although majority of the participants were from the major banks, findings from this study cannot be generalised to the overall South African banking industry. In addition, due to the smaller sample size, the outcomes from data analysis may be skewed by the inability to reproduce the data. Participants were also recruited in banks located in Johannesburg, and this resulted in geographic bias. In addition, the researcher was not professionally and this could have impacted data collection. Finally, the cross-sectional nature of the study gives a snapshot of views at a specific point in time, therefore, skills that will be perceived as important at a particular point in time may change over time. Importantly given the dynamic nature of technology itself, skills required in the future in the banking industry may change over time.

4.9 Conclusion

This chapter gave a detailed overview of the study design and methodology that was undertaken in this study to answer the research questions. The research instrument and measures taken to ensure the quality, validity, and credibility of the data were also discussed. In summary, this study used an exploratory qualitative approach to understand the skills that the banking industry now requires, given the context of its technological revolution. Semi- structured interview guide consisting of open-ended questions was used as an interview instrument and thematic analysis was used for data analysis. The next chapter will provide details on findings from the collected data.

CHAPTER 5: RESULTS

5.1 Introduction

This chapter reports on findings from the interviews collected from executives, heads of business units, human capital managers and graduates employed in the South African banking industry. Results are presented as per research questions. The research questions helped first to identify factors that contribute to the skills gap in the South African banking industry. Secondly, the key skills that the banking industry requires to adapt to the technological revolution now and in the future were also identified, and in line with this, skills that will be in less demand in future were also identified. Finally, the role that both industry and academia should play in bridging the skills gap alone or in combination is also presented.

This chapter first describes the sample that was used to answer the research questions, research conditions and themes that emerged from the thematic analysis of interview transcripts.

5.2 Description of sample and context

The South African banking industry is undergoing unprecedented change due to technological advances. This study aims to determine skills this industry now requires to cope and adapt to the dynamic environment now and in the future. The unit of analysis was the individual perceptions of the executives and graduates who are employed by the banking sector in Gauteng. Purposive, non-probability sampling was used to allow the researcher to use her judgement to select study participants according to preselected criteria. The sample of executives, human capital managers, and graduates provided the researcher with a holistic view and insights into the skills required by the banking industry to meet its changing demands compared with skills provided by institutions of higher learning in South Africa. **Tables 5-1 and 5-2** below show the graduates' and executives' profiles that were interviewed in this study, respectively.

Table 5-1: Executives demographic profiles

Participant	Position	Description of Role
A	Chief Executive Officer	Oversee day-to-day operations of the company
B	Director of an IT consulting company	Software development and support. Technology integration and implementation.
C	Human Capital Manager	Developing and implementing HR strategies. Managing the recruitment and selection process
D	Chief Information Officer	IT enabler. Monitoring and management of IT systems. Technology integration and implementation.
E	Platform Lead	IT enabler. Monitoring and management of IT systems. Technology integration and implementation.
F	Head of Digital Fraud and Governance	Digital risk mitigation and control. Technology implementation and intergration
G	Chief Information Officer	Running the technology function within the bank, also responsible for defining and implementing digital transformation for the bank
H	Head of Fraud Strategy and Support	Digital fraud support. Technology implementation and intergration
I	Governance	Manage the board and governance functions in the bank
J	Director of an IT consulting company	Software development and support. Technology integration and implementation.

Table 5-2: Graduates demographic profiles

Graduate	Majors/Field of Study	Role
A	Applied Mathematics, Computer Science	Software Developer/Developer Team Lead
B	Civil Engineering	Data Analyst
C	Mathematical Statistics, Applied Mathematics	Quantitative Analyst
D	Actuarial Mathematics, Statistics and Financial Mathematics	Financial Analyst (Intern)
E	Mechanical Engineering	Risk Analyst
F	Pyschology	Human Resources Graduate
G	Advance Math of Finance	Financial Analyst
H	Financial and Management Accounting	Business Assurance Accreditation Specialist
I	Actuarial Science	Financial Analyst
J	Business and System Analysis, Programming, Business Management	IT Systems Analyst

A total of 20 interviews were conducted, consisting of 10 executives or employers as well as 10 graduates. The identity of the participants as well as their organisations was withheld to ensure confidentiality. Pseudo names such as participant A (for executives) or graduate

A (for graduates) were used where direct quotes were attributed to the participants. The majority of the graduates were a snowball recommendation from the employer. All interviews were conducted using a virtual platform, and the participants were employers or employees in the top 5 banks or IT consulting firms in Johannesburg, South Africa. The interviews were at least 45 minutes long and interview questions were not sent to the study participants in advance. The consent letter was sent to all the participants prior to the interview process.

5.3 Digital adoption and the skills gap in the South African banking industry

There is limited data on the skills gap analysis in the South Africa banking industry, specifically in the context of the technological revolution and this is the gap that this study aimed to address. What became apparent from the interviews is the importance of the level at which the question on whether the skills gap exists in this industry is posed. At the industry or organisational level, the majority of executives stated that the South African banking industry is digitally advanced to cope with the technological revolution. They also mentioned that digitisation or automation is not new in South Africa, it has been implemented for decades in different arms of banking, such as investment banking. Executives also stated that South Africa is digitally competitive compared with the international counterparts and is ranked amongst the top countries in digital skills.

"… we've been on this journey for a long time. BANK 3 has been at the forefront in digital banking. I think because of the people that we have that it helps us and affords us to reach that journey of digitisation" (Participant D)

"I mean I think over time the group, has been pioneer in terms of digital adoption and if I bring it back to BANK 5 specifically I would say we are kind of at the forefront." (Participant E)

"So from a digitisation perspective, look we've started on the journey quite some time back." (Participant C)

However, when focusing specifically on the graduate skillset, there was an overall agreement amongst executives that it was insufficient to support the industry's technological advances. This was cited as one of the major threats facing the banking industry, as shown in **Table 5-3.**

Table 5-3: Industry threats and opportunities

Threats			Opportunities		
Rank	**Code**	**Frequency**	**Rank**	**Code**	**Frequency**
1	Inadequate skillset	160	1	Collaboration with nontraditonal players	23
2	Jobs becoming obsolete	25	2	Product diversification	4
3	Point of presence	18	2	Experience curve	3
4	Organisation inertia	10	4	Historic data	2
5	Bureaucracy and legacy	9	5	Demographic dividend	1
6	Competition for talent	9	5	Huge capital advantage	1
7	Decentralised systems	8			
8	Cyber threat	7			
9	Rise in FinTech competition	6			
10	Balance between innovation and profit	3			

Although the question asked aimed to identify threats that are currently facing the banking industry, both executives and graduates identified opportunities that the industry could leverage to remain competitive (**Table 5-3**). For example, they highlighted that banks have been in existence for over a century (experience curve) and therefore have a stronger customer base than FinTechs. They could use this advantage and tailor their product offerings to suit customer needs in order for them to gain a competitive advantage and market share. They also highlighted that banks have historical data which they use for consumer analysis – and this is what FinTechs lacks, they can therefore leverage this opportunity to gain market share.

To further understand the issue of the skills gap in the industry, four key research questions were posed to executives and graduates and these are presented in detail in the sections below.

5.4 Research Question 1: Why is there a skills gap in the South African banking industry?

This research question aimed to understand why the skills gap exists in the banking industry and individual factors contributing to this skills gap. A number of structural and systematic factors that contribute to the skills gap in South Africa were identified. The emerging themes that were emphasised by both graduates and employees as factors that widen the skills gaps and their organisational impact are shown in **Figure 5-1** below. Findings for each contributing factor are presented in detail below.

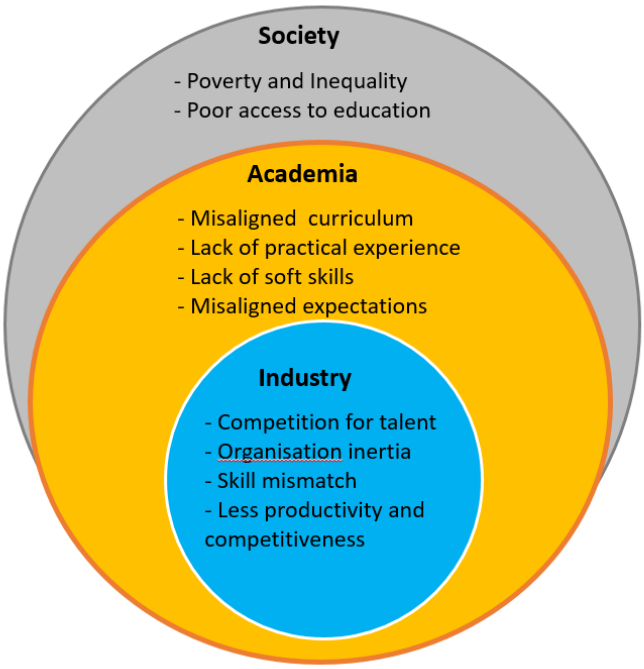


Figure 5-1: Threats and weaknesses that widen the skills gap

5.4.1 Poverty, inequality and poor access to education

The majority of the study participants cited poverty, inequality, poor access to quality education and digital access as some of the major contributing factors to the skills gap. The bias from industry in terms of recruiting students or partnering with prestigious institutions was also highlighted as one of the contributing factors to the skills gap and in turn, graduate unemployment.

"…digital inequality, because in Sandton you'll find the parents with two of their kids, plus they have got multiple devices. They have got Wi-Fi... If you are in Soweto you are lucky if you've got one phone, and if that phone it's a smart phone, because the majority of the phones they have in Soweto is to make a call and make SMS's, they are not smart phones. So we need to find a way of equalising opportunities in terms of access just to technology, to spectrum, and to Wi-Fi, cost-effectively". (Participant A)

"So kids, from good backgrounds and they went to good schools, when they get to varsity they have a higher chance of succeeding compared to the ones who didn't get that foundation correct… there's a significant poverty issue and there's a lot of not great access to education. What normally hinders our young black graduates when they start getting into these big corporates, it's not that they lack the skill, but they don't assimilate easily into those environments" (Participant J)

"I don't feel like this is an issue that will be resolved within the current generation. So like we've discussed there's a significant poverty issue and there's a lot of not great access to education" (Graduate C)

"*I think because we've lacked a lot of resources before the skill gap is quite large, and those who might have that skill are always at the top and never want to mentor the people at the bottom... if you were not privileged enough to acquire these skills, given your school or your background, or whatever, then you have to fend for yourself…"* (Graduate F)

5.4.2 Misalignment in curriculum with industry demands and expectations

The overarching message from both executives and graduates was the misalignment in what institutions of higher learning teach and the skills they produce compared with what industry expects. Executives and graduates highlighted that a poor correlation in skill demand and supply. Both executives and graduates mentioned that academia is still stream-focused where the curriculum is not flexible enough to allow students to choose courses in different streams. This is important in the context of the new jobs of the future, which require a cross-breed of careers. Both parties also mentioned that academic institutions still supply graduates who are in occupations that are at a high risk of automation.

"You've got computer science graduate, you've got the finance or accounting graduate, so it's still very much silo'ed and it's still very much functional, which is what we used to have in the past…. we're having a cross-breed of careers, so data science is an example. Qualitative analyst is another example. So now we're seeing a more cross of careers as opposed to previously where it was functions. And I think institutions need to relook at their offering and try to have more of the cross careers as opposed to the traditional functions." (Participant E)

"Technology has enabled us to have proper digital signatures that we don't need to drive anywhere or be together to sign documentation anymore. But higher education's today they still offer LLB, B.Com Law, all these qualifications without necessarily conducting a research of what are institutions looking for. So they will breathe 80% of graduates and then we employ 10. That's the reason why. They don't understand what businesses are ultimately trying to achieve so they offer us the "incorrect product" (Participant F)

5.4.3 Lack of soft skills

One of the trends in higher education is the increased demand for soft skills, especially in the context of the new world of work. Since some occupations are at a high risk of automation, there is an increased demand for soft skills since these cannot be automated. Employers mentioned that these is gap in soft skills, especially from graduates, since these are not taught in institutions of higher learning. They also mentioned the importance of incorporating these in the academic curriculum design.

"So I think they need to start focusing a lot more on the softer skills as well... as much as we're teaching them the theory and the hard skills and the technical skills, we need to teach them how to facilitate, how to network, how to build relationships, how to influence people." (Participant E)

"Maybe it's not for the universities to give them the foundation just for those softer elements, but I feel like we spent a little bit more longer, a little bit more time just to get them ready to match the hard skills and the soft skills." (Participant J)

"… we're getting a lot of graduates that on paper they look good, but their softer skills need to be incorporated into these pieces of paper that they're putting out. Where they start learning and building their negotiation skills, their assertiveness, the collaboration skills. It's the hybrid model that institutions need to look at. Don't just churn out graduates with pure academic background… start churning out maybe an academic qualification that complements the softer skills on it…" (Participant H)

"… they still need to be polished, and maybe it's on the softer side. Maybe on the hard skills they are ready and they can deliver. But that work is undone by the shortfall in how people perceive them around the urgency, the priority of things, and just getting the feedback to the different stakeholders in the way that it's required." (Participant E)

5.4.4 Brain drain

The socio-economic factors in Africa have seen many skilled professionals leaving the continent to pursue better opportunities abroad (Gaillard, Gaillard, & Krishna, 2015). This has resulted in the loss of *skills that are important for economic development and growth. One of the executives mentioned that this brain drain contributes to the skills gap in the banking industry.*

"I see a lot of our skill leaving the country purely because they're hoping they'll find greener pastures on the other side. The bottleneck is having a lot of skills leaving, right, and then

we're not producing enough skills." (Participant B)

5.4.5 Lack of practical experience

The graduates cited the lack of practical experience as the primary factor contributing to the skills gap and graduate unemployment. The majority of the graduates stated that they acquired sufficient skillset from their academic institutions to cope with their job requirements; however, the lack of practical experience was the bottleneck in ensuring that they transition easily to their roles.

"… from a sort of core functionality and core basics, from a development point of view, it does help quite a bit. But obviously learning about it and actually doing is two separate, completely different things." (Graduate A)

"… my engineering skills helped in that actually [current role] ... in varsity we're learning the theory, whereas in the workspace it's more practical" (Graduate B)

"I majored in actuarial mathematics, statistics and financial mathematics. So all of those do contain I would say a programming level where that would help me to do the job… using the knowledge and actually applying it in a correct manner, for me that was quite challenging." (Graduate D)

"… we are not fully equipped to work in corporate. And it's basically because firstly we don't know how to apply the knowledge and skills in the real world." (Graduate G)

"… *our curriculum doesn't do that, it's just theory, theory the whole time and then hope that okay the learner will then choose what to do and then find out when they are in the working environment what it means to apply whatever it may be that they were studying."* (Graduate D)

"I wouldn't say that they equipped me very well, they weren't practical kind of stuff, very theoretically based." (Graduate C)

"… varsity you basically are trained to write and succeed in a question paper, not necessarily to know how to apply these things in real life situations, to use them to solve [problems]." (Graduate I)

5.5 Research Question 2: Which key skills should graduates possess to cope with technological advances in the banking industry

This research question aimed to further explore the skillset that the banking industry is now looking for to cope with the technological revolution. Both graduates and executives were asked to identify key skills that graduates should possess to adapt to their environment. The key skills that were identified as critical for now and in the future were stratified into soft and hard skills. The hard skills that were identified by the majority of executives included quantitative and analytical skills such as mathematics, statistics, computer science, actuarial science, data science, robotics, engineering and machine learning, to name a few.

5.5.1 Critical skills in demand now and in the future

Executives and graduates identified key skills required now and in the future to cope with the technological revolution in their industry. A combination of soft skills and technical or "hard" skills as refer to herein were identified by employees and graduates. There were similarities in the skills that were identified by both parties. **Table 5-4** demonstrates the soft and hard skills that were identified by the graduates and executives, and supporting quotes are also shown below.

Table 5-4: Soft and hard key skills that are critical now and in the future

Rank	Hard skills	Frequency	Rank	Soft skills	Frequency
1	Data scientists	24	1	Social and emotional intelligence	48
2	Analytical skills	16	2	Communication skills	15
3	Coding	16	3	Design thinking	12
4	Programming	16	4	Co-ordination and time management	9
5	Artificial intelligence	8	5	Collaboration and teamwork	6
5	Digital skills	8	6	Systematic thinking	5
5	System engineers	8	7	Critical thinking	4
6	Computer science	6	8	Agility	3
7	Acturial science	5	9	Complex thinking	3
8	Robotics	3	10	Creative	1
9	Applied mathematics	2	10	Curiosity	1
9	Project management	2	10	Diligence	1
9	Statistics	2	10	Leadership skills	1

Hard skills

The hard skills that were stated by both executives and graduates include; coding, programming, machine learning, robotics, engineering and analytical skills, to mention a few. These are in line with the technical requirements of the digital world.

"The skillset is definitely changing, we're now looking for data scientists, because that's where we are, that's where we're looking. So from a graduate perspective the scarce skills are actuarial sciences, model validation, where you do data analytics and building of models." (Participant C)

"Data skills needs to be out there. Computing skill and quantum computing where you compute you can process a large amount of data from various sources at a high speed." (Participant E)

"…knowing how to code is one thing, but applying it with analytics behind it. So having an analytical mind that you can apply coding it's a skill that will be very, how can I say, lucrative and I guess that's where the game will be playing" (Participant H)

"…our latest interns, [have] actuarial science background. So those are the profiles that we are currently looking for… to say, okay, you need to be very quantitative or you need to be very strong in programming…" (Participant J)

Soft skills

In addition to the hard skills identified above, both graduates and executives highlighted the importance of soft skills as key skills that are important now and in the future. Soft skills that were identified include teamwork, collaboration, time management and co-ordination, empathy, mindfulness, leadership and influence, problem solving, complex thinking and design thinking as well as innovation and ideation, to mention a few.

"So the skills that are required moving forward are the ones where you are dealing with interpersonal skills. Skills of psychology or psychiatry. Skills of motivating and inspiring people. Skills of listening and really hearing." (Participant A)

"I think for me the skill number one, the soft skill number one that anyone should have is a social intelligence. Social intelligence is the ability to understand people, to communicate with people and then actually hear to relate with any kind of people, whatever are their social class and things like that. I think this is the number one skill that, especially in the South African society we must develop" (Participant B)

"… the new world of work is all about teamwork and team output, we need to be sure that they have got certain qualities that fit the culture and work with the team. The second one is we love application of logic, and we also want people with a very high learning desire, the ability to want to learn all the time" (Participant B)

"… skillsets or competencies that you might need now is a lot of collaboration. You can't do things, especially in a matrix organisation, collaboration is key. So influencing and collaboration are sort of key competencies that you're going to require for future skills…" (Participant C)

"Other skills that you would need is probably good problem solving skills… from a leadership point of view I would think you need probably very good people skills, so you'll be able to talk with your team and engage with your stakeholders quite effectively." (Graduate A)

"I mean people talk about social sciences not being important, but it actually is. I feel like as we become more digitised and as things get more automated there will be some kind of need for social sciences." (Graduate C)

"… *diligence and how you work, and how you behave is also as important as you knowing how to program"* (Graduate E)

"You have to be quite organised, you also have to be a critical thinker, strategic thinker…" (Graduate F)

From the graduate profiles shown in **Table 5-2**, the researcher also identified that majority of the graduates were not recruited based on their finance background but instead recruited from diverse fields of study which equipped them with quantitative, analytical, problem-solving and complex thinking skills.

5.5.2 Skills that will be in less demand in the future

Understanding how digital transformation and automation will alter the future of work is critical for identifying skills that will be in less demand in the future. The study participants also identified skills that will be in less demand in the banking industry, and these views were similar in both graduates and executives. Jobs or functions that were identified as being in the threat of becoming obsolete include all the repetitive tasks or tasks that require manual dexterity such as data capturers, bookkeeping, tellers and other administrative functions, risk managers and finance managers.

"…skills where you calculate stuff, where you group things. Where you try to make a living those that are repetitive, of sewing, of making shoes, of producing, of assembly lines." (Participant A)

"So it's your basic transactional processing guys, it's your call centre guys, and it's your basic admin and general worker type that's going to struggle in this environment..." (Participant C)

"The skills that I wouldn't say are necessarily redundant, but are not top priority for me. Administration skills, some people are very good at putting things in order and it's great, but that's why there's technology…" (Participant F)

"HR for instance, human resources, with the pandemic I think it kind of forced people to do things online. So that would mean if you have a workforce, human resource workforce of 80 you can cut it down to 5 people…" (Graduate D)

"I'd say like any job that's repetitive and can be automated. It will be easily replaced." (Graduate G)

5.6 Research Question 3: How is the financial industry responding to the change in skills required for the future world of work?

The technological revolution is changing the kind of skills suitable for employment and employers need to respond to this skills shortage to remain competitive (Minocha et al., 2018). Research question 3 aimed to assess measures that the employers are undertaking to address the issue of skills shortage within the banking industry. The graduates' perspective was also assessed to determine measures they are also taking to ensure their development to cope with the technological transition. Questions were tailored differently for executives and graduates. Research question 3 was aimed directly at executives or employers whereas graduates were asked how they continue to develop themselves to ensure that their current skillset matches their job requirements.

5.6.1 Employer perspective

The themes that emerged strongly amongst employers as measures to respond to skills shortages were providing internal and external training to upskill or reskill employees, importing skills as well as natural attrition whereby they do not fill a specific position following resignation or retirement of the employee. The importance of graduate recruitment programs or internships was cited as one of the effective measures that employers undertake to ensure that they equip employees with the required skillset

specific for their current environment. Very few employers cited retrenchment, and this was cited as the last resort.

- *Building in-house capabilities and skills import*

Executives mentioned that there are in-house training programmes or platforms for upskilling and reskilling their workforce. They also mentioned that if they cannot find a specific skill, they resort to importing the skill either from abroad or from different more experienced organisations.

"… there's quite a lot of work that we're doing in bringing the skill, building the skill. It's been a strategy for us for many years where we bring on young talent and we build and we grow them within the bank. And then there are times where you would have to buy a skill." (Participant C)

"… we continue to obviously try and look for other opportunities to upskill, and not only upskill but search, rather, for also high calibre technological giants, if I can call them that, to also come and join our organisation." (Participant F)

"… we are also injecting fresh blood into the organisation in big numbers so that we can get critical mass. And we're getting them not only directly from universities with the right training, we are also getting them from different industries that have already been doing better at this game." (Participant G)

- *Natural attrition*

  One executive mentioned that they also do not replace low-skilled employees who have resigned or retired to get rid of redundant skills.

"In my universe we've identified the new generation technologies [that] will get us to the point of where we are, and we've been upskilling basically on natural attrition." (Participant D)

- *Graduate recruitment programs and retrenchment*

Executives also highlighted the importance of graduate recruitment programmes and internships in equipping graduates with the relevant skillset and retrenching redundant skills that cannot be upskilled or reskilled.

"… which has worked very well for me, and I've had pretty good success on it, is in fact in our graduate programs. So in fact my data manager was a graduate two years ago, she's

now my data manager… We probably had about a total of six graduates as well as interns who have come out of school which have been part of certain study programs that I've taken into my team and then we've actually offered them positions. And they've helped us build to the point of where we are." (Participant D)

"So we then embarked on a grad program where we brought on like 20 data scientists, put them through a structured program and then we put them into the business. So we had to build our own skill… the last thing we actually look at is trying to retrench people. So most often we go into a redeployment process where we try to redeploy them into more suitable roles." (Participant C)

"So obviously from within the bank I don't think we're looking at retrenching staff, but more at how we can move the staff into a different area to improve their skills and have them learn to do something else." (Participant E)

5.6.2 Graduate perspective

Although most graduates felt that they had sufficient technical abilities to perform their current roles, they highlighted the importance of the graduate recruitment programmes or other internal training provided by employers to equip them with practical experience relevant to their current environment. They also mentioned guidance and mentorship by employers as critical factors contributing to their professional and personal development.

- *Graduate recruitment programmes, internships and other training platforms*

Similar views were observed from graduates who stated the benefits of the graduate recruitment programmes and internships in equipping them with the relevant skillset to perform their job requirements

"*So within the graduate program, the first month or two, they do have additional sessions just to go over liked your people skills and all of those other skills that are required, general skills from a graduate point of view that you would need."* (Graduate A)

"… the ones [skills] that I am very much developing now is programming… we were exposed to programming, but in terms of that being your day to day was not so much. So I know the basics but now that I'm in the job I am definitely getting into programming and coding and just learning to think in that way." (Graduate D)

"… through those trainings I was able to develop those sets of skills…" (Graduate E)

"We have a learning platform and there's quite a few pathways or content that you can

look at, content that you can also follow just to upskill yourself." (Graduate F)

"… what I also learnt during the graduate program is project management, how do you manage a project from end to end, how do you work with people…" (Graduate G)

- Guidance and mentorship

The importance of guidance and mentorship in skill development also came out strongly from most of the graduates.

"So I've been lucky enough to have within the company that employed me a mentor, so basically in terms of the specializing they are able to then show us exactly what it is that we'd need to know to be able to do these roles in a better way." (Graduate D)

"… you are also more than welcome to reach out to anyone in the organisation to say can I shadow you for a bit to kind of get a sense of the skill…" (Graduate F)

5.6.3 Collaboration with non-traditional players

Although literature suggests that the rise in technology start-ups will put pressure on the incumbents, both graduates and executes stated collaboration with the non-traditional players as one of the opportunities (**Table 5-3**) that the banking industry can leverage not only to retain market share but to build their skill base as well, Acquiring training from FinTechs seemed to be beneficial and is one of the effective ways that the banking industry uses to upskill or reskills their workforce.

"… we're partnering a lot with big technology companies so that they can actually help us where we've got shortages of skill, but we are also bringing in small Fintech companies to supplement our capability as well. So that's kind of how we're approaching this problem." (Participant G)

"So what FinTech companies do, they trained us… now the banks consult them. And they become consultants because of their training where they [graduates] learn financial stuff and also technical stuff. And then obviously that skill would definitely help the banks." (Graduate B)

5.7 Research Question 4: How can institutions of higher education develop and enhance future skills that are required by the workplace?

This research question aimed to assess both graduates and employers' individual perceptions in terms of the role that institutions of higher learning should play to equip graduates with the relevant skillset. To further probe whether the institutions of higher learning provide the graduates with the relevant skillsets that the industry requires, graduates were also asked how their acquired skillset, in terms of their educational background or choice of subjects, equipped them for their current job requirements.

There was concordance between executives and graduates in terms of the measures that that institutions of higher learning should play in bridging the skills gap. These are shown in **Table 5-5** below and ranked according to the frequency of mention.

Table 5-5: Recommendations on steps that academia should take to bridge the skills gap

Rank	Recommendation	Frequency
1	Industry academia collaboration	57
2	Tailor curriculum design	12
3	Early exposure to technology	10
4	Guidance and mentorship	7
5	Early career guidance	6
5	Proper preschool foundation	6
5	Vocational training	6
6	Industry experts in academia	5
7	Experiential learning	1
7	Learning through simulation	1
7	Winter schools	1

Key recommendations from both executives and graduates on the role that institutions of higher learning should play in bridging the skills gap were grouped into the following themes:

1) **Academic collaborations**
   -industry academic collaborations
   -Experts in academic

2) **Curriculum and teaching methodology**
   -Tailor curriculum design
   -Vocational training

-Experiential learning (learning through simulation)

3) **Mentorship**
   -Early career guidance
   -Winter school
   -Guidance and mentorship

4) **Proper pre-school foundation**
   -Early exposure to technology

5.7.1 Academic collaborations

The majority of the study participants highlighted the importance of collaboration between academia and industry to ensure a match in skills demand and supply. In addition, having industry experts in academia was also emphasised as a key measure to ensure alignment between academia and industry. These recommendations were similar between both executives and graduates.

Employers' perspectives

Executives suggested that institutions of higher learning should engage the industry to find out which skills they require to meet their needs and design their curriculum to align with the needs. They also mentioned the importance of having workshops and different forms to ensure constant engagement with the industry to assess if the skills that they are producing are still relevant to them.

"A very brilliant role that they can play is they themselves need to conduct an in-depth analysis of what companies are trying to achieve" (Participant F)

"Institutions on the other hand should actually try and work more closely with organisations, and even invite them to some workshops and try and get more input into what their curriculums should look like." (Participant C)

"… institutions do not conduct in-depth investigation and say, what do you think is going to catapult you to what you want to achieve?... [they] produce a graduate that is very good at information systems, but they are specialising in hardware. I don't need someone to fix our tower and a mouse and then fix the screen…I need a developer. That's why they can't get jobs, most graduates…" (Participant F)

"… the capacity of the education system is just not producing enough engineers… we are apparently producing like 40% of the engineers we need to get 5 – 10% economic growth in the next five to 10 years... we need corporate South Africa to invest and have skin in the game. So what you can't do is you can't expect the education system to produce ready material that come into your organisation and they start helping you to maximise and create value without you investing back into the system" (Participant G)

"You need to then start having the forums between maybe the leadership in the banking and the leadership in the educational institutions." (Participant E)

Graduates' perspectives

The views shared by the graduates were consistent with those of employers. They also highlighted the need to engage industry to ensure proper alignment in skills provided by academia with those that are required by industry.

"… one of the things that also probably needs to be done is for the institutions to probably sit down with the banking industry and see what is lacking, right? … come to an agreement and see how they can adapt their tertiary education and their degrees to sort of conform to and help out in terms of the skills that are needed so that graduates can get jobs." (Graduate A)

"… institutions could definitely go to the banks and actually maybe acquire more information on what exactly they are looking for in their graduates, or things like that. And try to just close that gap to actually see where the misalignment is with what they are teaching the graduates and what the banking industry is looking for from graduates" (Graduate B)

"… there should be a relationship between management in the higher institutions of learning and management in the banking industry." (Graduate E)

5.7.2 Industry experts in academia

Both executives and graduates stated the value of having industry experts in academia to ensure proper alignment in the curriculum with industry and the economy's needs.

"I think we will see in future business schools being chaired, and the executive directors being employed who are people that are experienced in running businesses, because

they can match from their own experiences what business requires and what institutions of higher learning should be developing as curriculum of the 21st century." (Participant A)

"So what I've seen so far that was working very well in Europe where I studied, is firstly, a lot of lecturers in universities are actually professionals. And that actually helps with that curriculum alignment with what's happening in the industry." (Participant B)

"So stakeholders from learning institutions should be in the industry just to see and be exposed to what it is the industry needs, and at the same time stakeholders from the industry must be involved in higher institutions…" (Graduate G)

5.7.3 Curriculum alignment

In the context of technological advances in the banking industry, some jobs are at a high risk of becoming obsolete, whereas the opportunity for new jobs to be created as a result of these technological advances exists. Therefore, the institutions of higher learning should ensure that they are equipping graduates with skills that will enable them to cope with the demands of the new world of work by aligning their curriculum with industry needs. The study participants highlighted the need for relooking at the curriculum design and teaching methodologies to address the skills gap in the industry. These views were similar in both graduates and executives.

"I have personally chatted to the new VC at institution X, and we are talking about how could we collaborate with him in making him realise his vision of becoming the MIT of the African continent. We're talking to academics at institution Y, and we really want to partner with them to try and improve what they are trying to do– and actually interestingly I'm of the view that we need deeper specialisation than their current generalisation approach in order to solve this problem." (Participant G)

"Institutions on the other hand should actually try and work more closely with organisations, and even invite them to some workshops and try and get more input into what their curriculums should look like." (Graduate C)

"… these are the skills that we need as banks, so let's go to let's say department in these varsities and at least like talk to the department about the skills that are important or required in a bank so they can at least tailor their curriculum in that way." (Graduate J)

5.7.4 Teaching methods

Executives and graduates highlighted the need for academia to revisit the teaching methodologies. They mentioned that the Socratic methods of teaching are not in line and no longer relevant in facilitating learning and equipping them with the technological skills that they will require in the digital era.

"The other thing that's good is the immersions and the experiential learning. I know there's – with the MBA's I mean it's a huge cost, right, but we don't have to look at it from a perspective of cost, we can do free things that will help with immersions and with experiential learning." (Participant C)

"I think people should be learning through simulation." (Graduate H)

5.7.5 Focus on building soft skills

One of the trends in higher education is the increased demand for soft skills especially in the context of technological advances. This has also come out strongly from employers as one of the key skills that graduates lack.

"So I think they need to start focusing a lot more on the softer skills as well... as much as we're teaching them the theory and the hard skills and the technical skills, we need to teach them how to facilitate, how to network, how to build relationships, how to influence people." (Participant E)

"Maybe it's not for the universities to give them the foundation just for those softer elements, but I feel like we spent a little bit more longer, a little bit more time just to get them ready to match the hard skills and the soft skills." (Participant J)

" .. we're getting a lot of graduates that on paper they look good, but their softer skills need to be incorporated into these pieces of paper that they're putting out. Where they start learning and building their negotiation skills, their assertiveness, the collaboration skills. It's the hybrid model that institutions need to look at. Don't just churn out graduates with pure academic background… start churning out maybe an academic qualification that complements the softer skills on it…" (Participant H)

"… they still need to be polished, and maybe it's on the softer side. Maybe on the hard skills they are ready and they can deliver. But that work is undone by the shortfall in how people perceive them around the urgency, the priority of things, and just getting the feedback to the different stakeholders in the way that it's required." (Participant E)

5.8 Conclusion

This chapter identified that a skills gap exists in the South African banking industry and multiple structural and systematic factors that contribute to this skills gap. It also started by identifying threats that the industry is currently facing and opportunities that it can leverage to remain competitive in the context of the unprecedented change that it is undergoing. Critical skills that the banking industry requires to cope with the technological advances now and in the future were also identified from both graduates and employers' perspectives. These include hard skills such as programming, coding, robotics, quantitative and analytical skills. The study participants highlighted that the soft skills will be in even more demand and these included collaboration, teamwork, problem-solving, design thinking, social intelligence, and agility. The threats and weaknesses that widen the skills gap as well as opportunities that can minimize the gap were also identified. The chapter concluded by providing recommendations on the role that industry and academia should play, alone or in combination, to bridge the skills gap. A conceptual model was build based on these findings and will be presented in Chapter 6. The next chapter will discuss the findings from this chapter.

CHAPTER 6: DISCUSSION OF RESULTS

This chapter presents a detailed discussion of the results that were presented in chapter 5. The results will be presented according to the research questions, however it starts by summarising key findings from introductory questions and then discusses findings from the research questions. The chapter also discussed the conceptual model that was derived from the research question and concluded by discussing the theory underpinning this study**.**

6.1 Introduction

The technological advances that are ongoing in the South African banking industry require new skills in order to adapt and gain a competitive advantage. The education system's inability to produce critical skills to meet industry demands – the “skill mismatch” contributes to youth and graduate unemployment in South Africa. Graduate unemployment wastes human capital and has long-term negative consequences on the economy. The shift from the manufacturing industry which favoured low-skilled workers to the technological-driven economy in South Africa exacerbated the unemployment rate (Pauw et al., 2006, 2008). This shift suggested that the poorly educated labour force would be at a disadvantage where employment is concerned (Pauw et al., 2008). In contrast, this has not been the case in South Africa as graduate unemployment has been increasing with the country’s unemployment rate which is currently at a staggering 30% in the third quarter of 2020 (Statistics South Africa, 2020a).

Although previous studies have assessed the skills gap in South Africa in the context of 4IR (Mamabolo & Myres, 2019), this was done in a single STEM industry. To the researcher’s knowledge, there is limited data on the skills gap analysis in the South African banking industry, especially in the context of technological changes that the industry is currently undergoing – and this is the gap that this study aims to address.

Studies performed in South African graduates demonstrated that one of the major contributing factors to graduate unemployment is the employer's lack of skills (Pauw et al., 2006, 2008). Similarly, a single study to date, performed in the South African banking industry, demonstrated that inadequate skillset is one of the determinants for employability in this industry (Oluwajodu et al., 2015). However, since technological advances are expected to change the skillset that employers are now looking for, this study becomes more critical in identifying the new skill requirements in the current technological-driven

environment. The banking industry needs to respond to the skills gap for it to remain competitive and measures that are being currently used by employers are described in this study. Finally, addressing the issue of skills gap will require engagement from multiple stakeholders. Therefore, recommendations on the role that both institutions of higher learning and industry should play to address the issue of skills gap is also described in this chapter.

6.2 Discussion of Introductory Questions

Prior to addressing the research questions, the researcher observed additional findings in this study about the perception of the skills gap in the context of technological revolution from both graduates and employers. The researcher asked the employers whether they have sufficient skillset in their organisation to support the technological advances in their industry. The responses differed amongst executives, and initially it seemed as if there was no clear indication whether a skills gap exists in the industry or not. However, when further questions were asked to better understand this issue it became apparent that the context or level in which the question of the skills gap is asked is very important. At the organisational or industry level, executives or employers felt that South Africa is digitally experienced and can adapt to meet the changing demand of its dynamic environment since digitisation is not new in the banking industry. They also stated that South Africa is highly competitive and they would rank it amongst the top countries globally in terms of digital skills. However, a few executives felt that South Africa is a laggard compared with other international counterparts due to the lack of innovation and ideation in the country.

However, when focusing specifically on the graduates, there was overall concordance that a skills gap exists amongst the graduates. It is the major contributing factor to the high level of youth and graduates unemployment, especially in their industry and South Africa general. This is consistent with previous studies that demonstrated a mismatch between graduates' skills with those required by the employer (Oluwajodu et al., 2015; Pauw et al., 2006, 2008).

6.3 Discussion of Research Question 1

Why is there a skills gap in the South African banking industry?

Graduates and executives described different factors that contribute to the skills gap in South Africa, and the key themes that emerged from this question were consistent between the two groups and are discussed in detail below. Skills gap affects labour productivity, innovation and employability (Oluwajodu et al., 2015; Pauw et al., 2006,

2008; Yu, 2013). With South Africa currently experiencing high rates of youth unemployment, understanding factors that contribute to the skills gap is critical.

6.3.1 Poverty and inequality

Poverty is a result of unequal distribution of power and resources –and is a product of South Africa's dark history of apartheid. The intersection between poverty, inequality, and unemployment came out strongly from the study participants. They highlighted the "poverty trap" of children born in disadvantaged backgrounds and the negative impact this has in terms of poor access to basic resources critical for human capital development (The World Bank, 2019). In support of this, Cloete (2015) has previously described the bidirectional relationship between poverty and unemployment - that unemployment causes poverty and poverty contribute to unemployment. This suggests that children born in poverty are most likely to be unemployed due to poor access to resources.

To further support this, digital access in South Africa is still a challenge due to poor broadband infrastructure and affordability of the internet, and this is skewed towards the previously disadvantaged population since the country has the highest inequality in the world. Poor access then limits the opportunities that come with digital access (ILO, 2020). Approximately 62% of South Africans were internet users in 2020 due to an increase in mobile device usage, suggesting an increase in internet penetration. However, when focusing on individuals with connection in their households, this number is reduced to 9.5% of the population. Similarly, a study conducted amongst South African university students demonstrated that the majority of students access publicly available internet on campuses and household internet access is still a major challenge as 63% of South African university students do not have internet access at home. The few that do have an internet connection through the use of mobile phones from data providers, which is an expensive exercise. Overall, these observations demonstrate that the poor youth and graduates in South Africa experience technology inequality, which may be at a disadvantage in this technological-driven economy.

6.3.2 Access to quality education

Both graduates and executives highlighted poor access to quality education as one factor that widens the skills gap. The study participants mentioned that critical skills are developed early in life continue to develop over time - a concept defined as lifelong learning (The World Bank, 2019). One participant mentioned that skills should be developed at a basic or primary level of education because by the time the youth reaches the tertiary level, most of their skills have developed and it becomes difficult teaching them

new skills. This is in support of literature that demonstrated that soft skills, in particular, develop early in life (Cunningham & Villaseñor, 2016). Since these skills have been shown to be critical in the future, these findings suggest that they should form part of early childhood development programmes and that government should improve the quality of education at the primary level. In addition, poor quality early childhood development programmes have been shown to result in poor development of cognitive and social skills (The World Bank, 2019). Furthermore, poor education outcomes at the basic level have been shown to contribute to the high dropout rate at tertiary institutions, highlighting the importance of quality education early in life (Pauw et al., 2008).

The graduates also mentioned the type of institution attended contributes to the skills gap. For example, graduates mentioned that the curriculum, especially from the historically white institutions (HWI), was already flexible to accommodate and meet changes in industry demands. They also highlighted that this was not consistent across all universities in South Africa. This supports the literature that showed institutional bias when employers are recruiting specifically graduates from HWI due to the perceived quality of training and skills offered at different institutions.

6.*3.3 Misalignment in curriculum with industry demands and expectations*

Institutions of higher learning have not kept up with the technological pace that came with technological revolution. The education system especially at the university level, focuses on providing technical or hard skills, but miss out on the soft skills that employers require (Cunningham & Villaseñor, 2016). However, they mentioned that they acquired soft skills from their employers as the institutions of higher learning did not equip them with these skills. The technological era demands soft skills as they cannot be digitised or automated (Frey & Osborne, 2017; PwC, 2017b).

This study demonstrated different perceptions between employers and graduates where it comes to graduate preparedness for the workplace. The majority of the graduates in this study believed that their institutions of higher learning equipped them with the technical skills required to meet their job requirements.. In contrast, employers perceived graduates to lack the critical skills relevant to their work environment, and these observations are consistent with Lie (2008).

6.3.4 Lack of practical experience

Consistent with other studies (Pauw et al., 2006; Yu, 2013), graduates in this study mentioned the lack of practical experience as an inhibitor to academia-to-workplace transition. They stated that the institutions of higher learning are “theory-focused” and they

were unable to apply the theoretical knowledge in their work environment. This suggest that institutions of higher learning are not producing “plug-and-play” graduates that are ready for the current environment as additional training from employers is still required.

6.4 Discussion of Research Question 2

Which key skills should graduates possess to cope with technological advances in the banking industry

As technology is replacing occupations that can be digitised or automated, it has also created opportunities for new jobs that did not exist previously. Cunningham and Villasenor (2016), performed a literature review on 24 studies which evaluated the critical skills that employers from different countries and diverse industries require and ranked them according to the order of importance. In these studies, social intelligence, teamwork and communication ranked the highest, then followed by the technical skills (Cunningham & Villaseñor, 2016). This is consistent with our findings where the importance of soft skills was highlighted more than the technical skills, and these ranked the highest. These views were consistent between graduates and executives.

The critical soft skills mentioned by both graduates and executives include critical thinking, decision making, complex problem solving, agility, oral presentation, report writing, teamwork, collaboration, leadership, and social or emotional intelligence. These findings are in line with studies demonstrating that problem-solving, collaboration, and social intelligence complement technology and facilitate adaptation to a dynamic work environment (PwC, 2017b).

The technical skills that have been identified by both executives and graduates include machine learning, coding, programming, robotics, data analytics, engineering, to name a few. These skills have been found to be attractive to employers; however, they mentioned that a gap exists in these skills, especially the soft skills, since they do not form part of the curriculum (Cunningham & Villaseñor, 2016; Pauw et al., 2008). In addition, soft skills such as leadership, communication, collaboration and teamwork were shown to correlate with organisational productivity and performance (Essex et al., 2016) in support of our findings. This suggests that these skills need to be urgently prioritised by the banking industry to meet its changing environment and human capital development.

Jobs that can be easily automated are also being replaced by automation (The World Bank, 2019). Employers must identify these to assess the workforce or areas in their organisations that will require upskilling or reskilling. Participants also identified skills that

will be in less demand in the future. Both graduates and managers identified tasks requiring manual dexterity and repetitive tasks at a high risk of automation and at a risk of being in less demand in the future. Occupations or tasks such as bookkeeping, tellers, accountants, risk managers, financial managers, customer relationship managers, and other front desk workers were identified as least important in the banking industry in the near future.

6.5 Discussion of Research Question 3

How is the financial industry responding to the change in skills required for the future world of work?

Digital transformation is changing skillset suitable for employment, and employers need to respond to this skills shortage to remain competitive (Minocha et al., 2018). Digitisation and automation have resulted in less demand for low-skilled workers (Pauw et al., 2008; PwC, 2017b; The World Bank, 2019; Yu, 2013). The WEF report argues that 4IR will bring about change that will result in skill shortages and job displacements (World Economic Forum, 2019a). Job displacement and increased unemployment will increase due to technological advances and skill shortages (The World Bank, 2019), therefore highlighting the need to upskill or reskill employees to meet the new skill requirements.

The skills gap can be addressed through the education system or various training initiatives organised by the employer for those no longer in the schooling system. Employers or executives in this study mentioned that they have been upskilling and reskilling employees to ensure that their workforce is equipped with the relevant skillset. This has been achieved through the use of internal training such as graduate recruitment programmes, internships and other learning platforms. The executives also mentioned that they use natural attrition and import skills to adapt to the skills shortages.

Banks are also changing their recruitment strategy. What became evident is the shift from recruiting graduates from traditional finance streams into the industry. Employers mentioned that they are using a competency-based recruitment approach instead of the traditional qualification-based approach. This was verified by the graduates who were recruited in this study. The majority of the graduates possessed analytical and quantitative skills, some from engineering or science backgrounds. These subjects have been shown to be critical for problem-solving and systematic thinking (Mamabolo & Myres, 2019). In support of our findings, a survey by McKinsey and Company (2017) on young people and employers across 90 countries, demonstrated that 60% of employers stated that new graduates were not adequately prepared for the workplace and identified gaps in STEM

skills and lack of soft skills as a major bottleneck to employability (McKinsey and Company, 2017).

An interesting finding was that banks also partner with FinTechs to upskill and reskill their workforce. This demonstrates a symbiotic or strategic partnership between the new entrants and the incumbents. Literature has suggested a competitive relationship between the banks and new technology start-ups (Omarini, 2017; Vives, 2019); however, this study demonstrated that most employees and executives view the relationship to be more collaborative instead of competitive.

6.6 Discussion of Research Question 4:

How can institutions of higher education develop and enhance future skills that are required by the workplace?

Both executives and graduates gave recommendations regarding the role that both stakeholders should play in addressing skills shortage. The recommendations included a collaboration between institutions of higher learning and industry to ensure that there is an alignment between the curriculum design and industry needs, having industry experts in academia, updating teaching methodologies to fix the current context, guidance and mentorship.

Although tertiary institutions play a critical role in providing skills required to meet industry demands and lifelong learning (The World Bank, 2019), addressing the skills gap will require collaboration and engagement between academia and industry. The employers should also bear the responsibility of upskilling and reskilling employers who are no longer in education. This collaborative relationship will require institutions of learning and industry to become learning organisations (Gil, Carrillo, & Fonseca-Pedrero, 2019). This was also emphasised by both executives and graduates in this study.

Teaching the new sets of skills will require requires different and new methodologies. Graduates and executives in this study recommended teaching methodologies such as learning by simulation or experiential learning and vocational training as tools to equip them with the practical experience and skills critical for the work environment. Regarding vocational training, part of the SDG 4 sub-goal is to increase access to vocational education and training (VET) to equip the youth with critical skills required in the workplace (Boeren, 2019). However, youth with vocational training has been shown to be working in jobs that are at a high risk of automation (Frey & Osborne, 2017) since this type of training provides job-specific technical skills. These skills have been shown to become obsolete

quickly, especially in the face of technological advances (Hanushek, Schwerdt, Woessmann, & Zhang, 2017). For vocational training to be effective in the digital economy, it needs to be tailored according to the current environment and include cognitive or soft skills that have been critical in the technologically driven economy (Cunningham & Villaseñor, 2016; The World Bank, 2019).

6.7 A Conceptual Model Derived from the Research Questions

Findings from this study resulted in a conceptual model shown in **Figure 6-1** below. It shows the connection between the research questions and how they assisted the researcher in exploring and further understanding the issue of skills gap in the banking industry What the model shows is that multiple structural and systematic factors contribute to the skills gap and to address the issue of the skills gap, a thorough understanding of these factors and their intersection will be required. The model shows that the skills are bound in a specific context, therefore emphasising the need for collaboration between different stakeholders.

To understand which skills need to be taught, there must be engagement and collaboration between institutions of higher learning and industry. This will ensure proper curriculum alignment with industry demands. This will also result in producing skilled graduates that can be absorbed by the industry and in turn, reduce youth unemployment. The model shows that a combination of hard and soft skills was identified as crucial for the future world of work. Hard skills such as coding, programming, machine learning, robotics, analytical and quantitative skills were identified as critical skills that the banking industry requires to cope with the dynamic environment now and in the future. Soft skills such as communication, collaboration, teamwork, time management and co-ordination, agility and complex problem solving were identified as critical for now and in the future. The model also highlights the importance and role of teaching methodologies in the skill gap. If the critical skills are provided and taught in a relevant manner, practical, and applicable to real-life cases, this would narrow the skills gap.

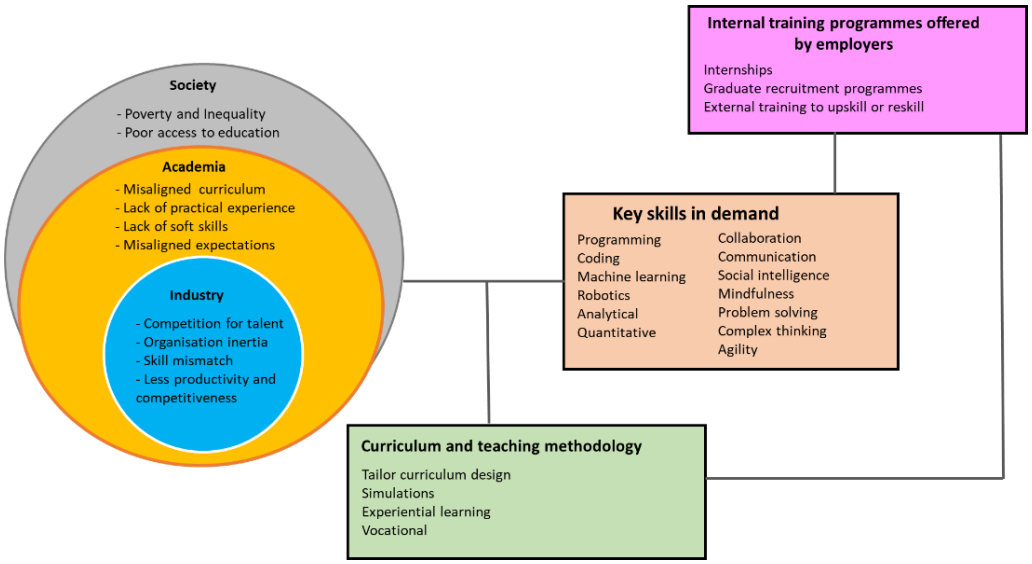


Figure 6-1: A conceptual model derived from findings in this study. Source: Author's own

6.8 Human Capital Theory

The theory underpinning of this study is the Human Capital Theory which argues that investment in education results in skills required to perform tasks. However, observations from this study demonstrate that this theory is incomplete and not generalisable as it does not take into account other factors. For example, it generalises that education will provide individuals with all the relevant skills required for work and do not specify or even consider that not all skills are relevant or required for productivity and competitiveness. What is evident in this study is that institutions of higher learning do not equip graduates with practical knowledge and skills that will enable them to be effective and adaptable in the work place. Graduate unemployment also contradicts this theory in that the theory suggests that, that the higher the level of the individual's education level, the higher their employment prospects.

CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS

This final chapter summarises the main research findings that answer the research questions and presents the contribution to business and theory. It also gives recommendations to institutions of higher learning, industry and other stakeholders concerning bridging the skills gap. Furthermore, the chapter concludes by highlighting the limitations of the study and recommends areas for future research. -

7.1 Summary of the Research Objectives

The objectives of this study were:

- To investigate why there is a skills gap in the South African banking industry
- To investigate the kind of skills that banks require given the digital transformation in the financial industry?
- To determine the role that institutions of higher learning and industry can play in ensuring proper alignment between the curriculum and industry needs to ensure that they equip graduates with the right skillset to adapt to the jobs of the future

7.2 Principal Conclusions

The exploratory study addressed all the research objectives stated above. This study validated that the skills gap exists in the South African banking industry in the context of the technological advances that are taking place in this industry. The impact of 4IR in the South African education sector, specifically the STEM industry (Mamabolo & Myres, 2019) has been previously assessed. This study adds to the literature evaluating the impact of the technological revolution in the South African banking industry, especially from employers' and graduates' perceptive. What became evident is the importance of the level or context in which the skills gap question is posed. However, managers felt that graduates did not have the sufficient skills to adapt to their changing environment and require further training by the employers to meet the job requirements.

This study identified different factors that contribute and widen the skills gap in the South African banking industry to address the first objective. These included poverty, poor access to quality education, brain drain and lack of practical experience. These factors have been previously described in other studies and have been shown to also contribute to youth and graduate unemployment in South Africa (Oluwajodu et al., 2015; Pauw et al., 2006, 2008; Yu, 2013). There are limited studies that have assessed the topic of skills gap

from both employers and graduates' perspectives. This study contributed to this gap in the literature.

This study identified key skills that the banking industry requires now and in the future to adapt to the technological advances to address the second objective. Digitisation and automation have changed the skills that employers require, with most tasks performed by low-skilled workers being automated (Frey & Osborne, 2017). Identification of jobs or tasks at a high risk of automation and identification of future jobs that will arise as a result of automation is critical for employers since they would need to upskill or reskill their workforce to ensure that they have the required skillset. This study identified jobs that are at a high risk of automation or that will be in less demand in the future as well as skills that will be critical in the future.

As the banks are transitioning to digital platforms, coding, programming, machine learning, and robotics are skills that the participants perceive as critical skills. In addition, there a strong emphasis on the importance of social and cognitive skills such as communication, collaboration, social intelligence, complex problem solving, decision making, design thinking, agility and adaptability as these are tasks that still cannot be automated. Skills that were identified as less attractive in the future include bookkeeping, tellers risk managers, and other administrative tasks that require manual dexterity, precision or repetitive. These findings are also in agreement with literature as the world bank and others have highlighted the importance of soft skills in the future world of work (Cunningham & Villaseñor, 2016; PwC, 2017b; The World Bank, 2019).

To address the third objective on measures that the industry has been taking to address the skills gap, employers provided insight into different methods that they have implemented to deal with skills mismatch. Although the issue of skills gap should be addressed at the level of institutions of higher learning, who are expected to develop and instill skills that are critical for employability (The World Bank, 2019). The industry should also collaborate with institutions to identify and communicate the skills required and ensure a proper alignment between the required skills' demand and supply. Employers have been upskilling and reskilling employees to ensure that their workforce is equipped with the relevant skillset. Employers have been using internal training such as graduate recruitment programmes, internships and other learning platforms to upskill and reskill their employees. The managers also mentioned that they use natural attrition and import skills to adapt to the skills shortages. An interesting finding was that banks also partner with FinTechs to upskill and reskill their workforce. This demonstrates a symbiotic or strategic partnership between the new entrants and the incumbents. Literature has

suggested a competitive relationship between the banks and new technology start-ups; however, this study demonstrated that most employees and executives view the relationship as more collaborative instead of competitive.

The last research objective aimed to determine the role that institutions of higher learning and industry could play in addressing the issue of skills gap. Both executives and graduates gave recommendations regarding the role that both stakeholders should play in addressing the skills shortage. The recommendations included a collaboration between institutions of higher learning and industry to ensure that there is an alignment between the curriculum design and industry needs, having industry experts in academia, updating teaching methodologies to fix the current context, guidance, and mentorship.

This study shows that addressing the skills gap will require collaboration and engagement between academia and industry. The employers should also bear the responsibility of upskilling and reskilling employers who are no longer in education. This collaborative relationship will require institutions of learning and industry to become learning organisations (Gil et al., 2019).

A conceptual model shown in the previous chapter (**Figure 6-1)** was derived from this study's research finding. It shows the connection between the research questions and how they helped the researcher explore and further understand the issue of the skills gap in the banking industry. This model demonstrates different factors that contribute to the skills gap in the South African banking industry, as identified by the study participants, and that these occur at a contextual level. Specific skills that are critical now and in the future are also indicated in the figure, suggesting that providing graduates or employees with these skills will minimize the skills gap. The interlink between institutions of higher education and industry is also shown in the model, which emphasise the need for collaboration and engagement to identify the critical skills that are required. This will be important for upskilling or reskilling employees if they are already out of the education system or instill these in the upcoming graduates to ensure that they adapt to the work environment.

Graduates felt that institutions of higher learning were "theory-focused" and suggested that experiential learning or learning through simulations and doing "real life" cases would provide them with the relevant practical experience and skills that will make transitioning to the work environment easier. Literature has also identified a lack of practical experience to contribute to graduate unemployment (Pauw et al., 2008). The human capital managers or employers in the banking industry felt that graduates possessed the relevant technical skills to meet their job requirement, however it is the soft skills that are lacking significantly

(Cunningham & Villaseñor, 2016; Oluwajodu et al., 2015; Pauw et al., 2006) suggesting that institutions of higher education should prioritize the inclusion of courses that address the development of these critical skills. Teaching lifelong skills at a tertiary level has been challenging and a bit too late since they develop early in life and increase over time (The World Bank, 2019). This emphasise the need for lifelong learning. The view of graduates was critical in this study since it offered perspectives from individuals who have just gone through applying for a job as a graduate and provided insight on the requirements of getting employed and workplace preparedness. They also gave insight into the current state of the curriculum design and, importantly their perception of the critical skills for the future world of work

7.3 Implications for Management and other Relevant Stakeholders

This research contributes to identifying key skills that the South African banking industry now requires to cope with the current demands. Identifying key skills that are required by the banking industry to meet it demands now and in the future will ensure that:

- institutions of higher learning tailor their curriculum design to align with industry needs
- institution of higher learning prioritises the development of critical future skills to increase employability
- the teaching methodologies are altered to fit the current context and provide graduates with the practical experience required in the workplace
- employers upskill and reskill their workforce to meet their current and future needs
- universities include soft skills as part of the curriculum since there is a strong emphasis on the relevance of these skills
- Identification of key skills by employers will enhance increase productivity, innovation and organisational performance.

7.4 Limitations of the Research

This study's limitations include the smaller sample size selected from one geographic location; therefore, these findings cannot be generalised to the overall South African banking industry. Some of the graduates used in this study were “entry-level” graduates still in internships or training programmes, therefore they may not have a clear view of the critical skills that the banking industry now requires to cope with technological advances. The cross-sectional nature of the study gives a snapshot of views at a specific point in time; therefore, skills that are perceived as important at a particular point in time may change over time. Importantly given the dynamic nature of technology itself, skills required

in the future in the banking industry may change over time. The interviewer bias and interviewing competency may have affected data collection and interpretation of the results.

7.5 Suggestions for Future Research

The education level has been shown to contribute to the skills gap and graduate unemployment, suggesting that employers prefer graduates with postgraduate training. Future studies should evaluate if this is consistent in the banking industry, especially in the digital era. Graduates in this study possessed diverse qualifications skewed towards engineering, science, mathematics and technology backgrounds. Only one graduate had a qualification in the humanities stream. Future studies should include graduates from non-STEM related courses and assess their adaptability to the banks changing environment. Finally, future studies should be performed longitudinally to determine how critical skills will evolve over time with the evolving technology.

7.6 Conclusion

The theory underpinning of this study is the Human Capital Theory, which argues that investment in education results in skills required to perform tasks (Becker, 1964). However, this study demonstrated that this theory cannot be generalisable as it does not take into account other factors. For example, it generalises that education will provide individuals with all the relevant skills required for work and do not specify or even consider that not all skills are relevant or required for productivity and competitiveness. This study shows that ***key skills*** need to be applied to the task for optimum performance. The theory also does not take into account that knowledge cannot only be acquired through education, that a collaborative effort between industry and institutions of higher learning is critical for human capital development. What is evident in this study is that institutions of higher learning do not equip graduates with practical knowledge and skills that will enable them to be effective and adaptable in the workplace. This suggests that the curriculum design and teaching methodologies used by institutions of higher learning need to be re-evaluated to equip graduates with the skills that the banking industry requires to adapt to its changing environment. Finally, investment in human capital development by addressing the issue of the skills gap in the banking industry and unemployment will require industry, academia, government and other key stakeholders. This will be critical for the productivity and competitiveness of the country.

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APPENDICES

Appendix 1: Consistency matrix

TITLE: Bridging the Skills Gap in the Financial Industry: Uncovering the Skills that Banks Require in the Future World of Work

RESEARCH QUESTIONS	LITERATURE REVIEW	DATA COLLECTION TOOL	ANALYSIS
Research question 1 Why is there a skills gap in the South African banking industry?	Hu, 2019; Reddy, Bhorat, Powell, Visser & Arends, 2016; Oluwajodu, Greyling, Blaauw and Kleynhans, 2015	Questions 1 and 2, face-to-face interview	Frequency analysis of perceived skills that are relevant as well as content analyss on open-ended questions
Research question 2 How is the financial industry responding to the change in skills required for the future world of work?	Vives, 2019	Questions 3 to 7, face-to-face interview	Content analysis on open-ended questions to determine how the banking industry is responding to changing demands
Research question 3 How can institutions of higher education develop and enhance future skills that are required by the workplace?	Reddy, Bhorat, Powell, Visser & Arends, 2016; Marimuthu, Arokiasamy, & Ismail, 2009; Pauw, Bhorat, & Goga, 2006	Questions 8 to 10, face-to-face intervies	Content analysis on open-ended questions to assess the role that the banking industry and institutions of higher learning should play in closing the skills gap

Appendix 2: Consent letter

Dear Mr/Miss/Mrs

I am currently a student at the University of Pretoria's Gordon Institute of Business Science and completing my research in partial fulfilment of an MBA. I am conducting research on skills that the banking industry requires to adapt to the changing environment that comes with technological transformation. The interview is expected to last about an hour, and will help us understand the type of graduates that the banking industry is now looking for to cope with its changing demands now and in the future. Findings from this study will contribute to the literature on the skills gap in the South African banking industry. Importantly, this study will provide a case for companies/employers and the institution of higher education to engage and come up with solutions to ensure proper alignment between skills that are taught in the institutions of higher learning and skills that are required in the workplace as one of the measures to reduce the alarming unemployment rate in South Africa. Your participation is voluntary, and you can withdraw at any time without penalty. All data will be reported without identifiers. If you have any concerns, please contact my supervisor or me.

Our details are provided below.

Researcher Name: Zanele Ditse

Email: 19384506@mygibs.co.za

Phone 079 890 2351

Research Supervisor: Hayley Pearson

Email: pearsonh@gibs.co.za

Phone: 076 930 2170

Name of participant: _____

Signature of participant: _____

Date: _____

Appendix 3: Interview guide for executives

Question 1

Can you please tell us about your job and your daily tasks within this facility?

a. What is your role?
b. How long have you been in this role?

Question 2

What are some of the challenges you are currently facing when recruiting graduates into the business?

Question 3

In your opinion, what are the most and least important skills that graduates employed in the South African banking sector should possess?

Question 4

What is the greatest challenge or threat your industry is facing**?**

Question 5

How is digitisation or technology used in the South African banking industry?

Question 6

Is the current workforce able to support the technological advances in your sector?

Question 7

How are the required skills obtained by employees in your business?

Question 8

Are these skills sufficient to enable employees to adapt to the banks changing needs now and in the future?

Question 9

In your experience, do you feel that tertiary institutions produce graduates that are ready for your current environment, and please elaborate?

Question 10

How can institutions of higher learning assist the banking industry with closing the skills gap?

Question 11

How can both institutions of higher learning and industry assist in closing the skills gap?

Appendix 4: Interview guide for graduates

Question 1

1. Can you please tell us about your job and your daily tasks within your organisation?
    a. What is your role?
    b. How long have you been in this role?

Question 2

What skills does your role require?

Question 3

How did you acquire these skills, were they taught at your institution of higher learning or obtained through the graduate recruitment program or any other training provided by your employer?

Question 4

What were your majors/field of study at the institution of higher learning and would you say they have adequately equipped you for your current role?

Question 5

How did you find adapting to the work environment post your academic training, what were your major challenges when transitioning to the work environment?

Question 6

How is digitization or automation used in the banking industry and how do you see that evolving in the next few years?

Question 7

Is your current skillset able to support the technological advances in your sector now and in the future? Will you please elaborate?

Question 8

In this digital era, specifically within the banking industry what skills or competencies do you feel are the most and least important that graduates should possess?

Question 9

Do you think tertiary institutions produce graduates that are ready for the banks' current environment or industry needs, and please elaborate?

Question 10

What is your view on the traditional approaches to education and the curriculum design, especially in the context of the digital age?

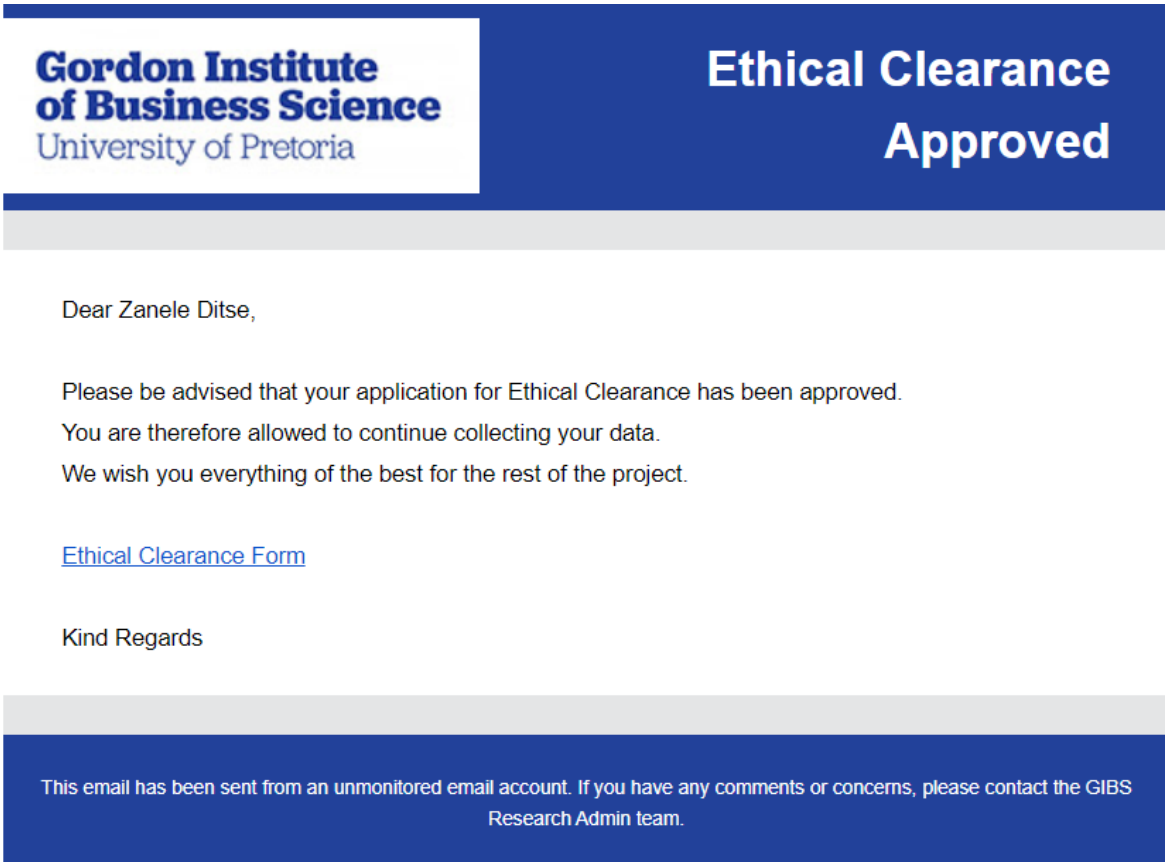
Question 11

How can institutions of higher learning assist the banking industry with closing the skills gap?

Question 12

How can both institutions of higher learning and industry assist in closing the skills gap?

Appendix 5: Ethical clearance



Gordon Institute of Business Science
University of Pretoria

Ethical Clearance Approved

Dear Zanele Ditse,

Please be advised that your application for Ethical Clearance has been approved.
You are therefore allowed to continue collecting your data.
We wish you everything of the best for the rest of the project.

Ethical Clearance Form

Kind Regards

This email has been sent from an unmonitored email account. If you have any comments or concerns, please contact the GIBS Research Admin team.

Appendix 6: Non-disclosure agreement

25. APPENDIX 6 CERTIFICATION OF ADDITIONAL SUPPORT

(Additional support retained or not - to be **completed by all students)**

Please note that failure to comply and report on this honestly will result in disciplinary action

I hereby certify that (please indicate which statement applies):

- *I DID NOT RECEIVE any additional/outside assistance (i.e. statistical, transcriptional, and/or editorial services) on my research report:*

  .....

- X *I RECEIVED additional/outside assistance (i.e. statistical, transcriptional, and/or editorial services) on my research report* Transcriptional services

  .....

If any additional services were retained– ***please indicate below which:***

☐ ***Statistician***

☒ ***Transcriber***

☐ ***Editor***

☐ ***Other (please specify:.....)***

Please provide the name(s) and contact details of all retained:

NAME: **Eve Armstrong**

EMAIL ADDRESS: **audtranscriber@gmail.com**

CONTACT NUMBER: **0785896602**

TYPE OF SERVICE: **Transcription**

Appendix 7: Atlas.TI codebook

Code	Code Groups
Able to support current skill demand	
Academia does not teach soft skills	Challenges_Industry Challenges_Education
Academia is theory-focused	Challenges_Industry Challenges_Education
Access and inequality	Challenges_Education
Accountability	Soft skills
Accountants, CAs specialised fields	
Acturial science	Hard skills
Adequately prepared for current role	
Adequately prepared for work	
Administrative functions	Least important skills
Agile and adaptable	Soft skills
AI performing HR functions	Digitisation in South Africa
AI preforming risk functions	Digitisation in South Africa
All-in-one stop	Digitisation in South Africa
Analytical skills	Hard skills
Application of knowledge	Challenges_Industry
Artificial intelligence	Hard skills Digitisation in South Africa
Balance between innovation and profit	Challenges_Industry
Balance soft and hard skills	
Bank-FinTech collaboration	Digitisation in South Africa
Banks are product-focused	Challenges_Industry
banks to maximise consumer analysis	
Behavioural science	Soft skills
Better quality graduates	
Big transition gap between tertiary and work	
Book keeping	Least important skills
Brain drain	Challenges_Industry
Brand and marketing	
Building dynamic capabilities	
Bureaucracy and legacy	Challenges_Industry
Business analysts	Hard skills
Carrer days with industry experts	
Client experience	
Coding	Hard skills
Collaboration and teamwork	Soft skills
Collaboration prefernce limited	
Communication skills	Soft skills
Community outreach programs	
Compant sponsorships	
Competency-based recruitment	Recommendations Industry response to skills gap
Competition for talent	Challenges_Industry

Competitive governance skills	
Complex problem solving	
Computer science	Hard skills
Conferences with corporate	Recommendations
Consumer data analysis	
Consumer preference	
Convenient banking	
Co-ordination and time management	Soft skills
Corporate Social Investment	Recommendations
Cost saving	Digitisation in South Africa
Creative	Soft skills
Cross-breed careers	Challenges_Education
Culture is important	
Curriculum already flexible	
Curriculum and economy misalignment	Challenges_Education
curriculum and industry misalignment	Challenges_Education
Customer centricity	Digitisation in South Africa
Customer onboarding	Challenges_Industry
Customer retention	Digitisation in South Africa
Cyber threat	Challenges_Industry
Data entry	Least important skills
Data scientists	Hard skills
Demand-supply mismatch	Challenges_Education
Demographic dividend	Industry opportunities
Design specialists	Hard skills
Different market segment	Digitisation in South Africa
Digital advise	Digitisation in South Africa
Digital divide	Challenges_Industry Challenges_Education
Digital inequality	Challenges_Education
Digital pioneers	Digitisation in South Africa
Digital skills	Hard skills
Digital transition	Digitisation in South Africa
Digitisation not new	Digitisation in South Africa
Diligence	Soft skills
Discipline	Soft skills
Diverse culture	
Dynamic digital skillset	
Dynamic learning approach	
Early career guidance	Recommendations
Early exposure to technology	Recommendations
Economic downrurn imact on employment	
Education background plus agility	
Education based on real world cases	Teaching methodologies
Efficiency	Digitisation in South Africa
End-to-end product development	Digitisation in South Africa
Engineering background	Hard skills
Ensuring accountability and responsibility	
Enterprise architects	

Entrepreneurial skills	
Experience curve	Industry opportunities
Experiential learning	Teachingmethodologies
Fair innovation and digital skills	
Fast-paced technology	Digitisation in South Africa
Financial literacy	
Fintech collaboration	Industry opportunities
FinTech competition	Challenges_Industry
Fintech skill transfer	Industry response to skills gap
Fixed curriculum	Challenges_Education
Fixed mindset	Challenges_Industry
Focus shifted towards creativity	
Free education	
Functional silos	Challenges_Industry
Good competitive advantage	Digitisation in South Africa
Graduate recruitment program beneficial	Industry response to skills gap
Growth mindset	Soft skills
Guidance and mentorship	Industry response to skills gap
Hierachy limits agility	Challenges_Industry
High risk apetite	
Historic data	Industry opportunities
Huge capital advantage	Industry opportunities
Human resources	
Immersion	Teaching methodologies
Improve basic education	Recommendations
Inadequate skillset	Challenges_Industry
Inadequate STEM graduates	Challenges_Industry
Inadequately equipped for work	
Inconvenience	
Increase in innovation	
Increase in internet penetration	Digitisation in South Africa
Individual capabilities	
Industry academia alignment	Recommendations Challenges_Education
Industry academia collaboration	Recommendations Challenges_Education
Industry academia government partnerships	Recommendations
Industry experts in academia	Recommendations
Infrastructure challenges	Challenges_Education
In-house skill development	Industry response to skills gap
Innovation hubs	Recommendations
Insufficient black professionals	
Interactive tasks	Teaching methodologies
Internship programmes	Recommendations
Intersection between human and technology	
Intuition-driven decisions	Digitisation in South Africa
Invest in entrepreneurs	
jobs becoming obsolete	Challenges_Industry
Lack of analytical skills	Challenges_Industry

Lack of career guidance	Challenges_Education
Lack of commitment from industry	Challenges_Industry
Lack of guidance or mentorship	Challenges_Industry
lack of industry-academia alignment	Challenges_Industry
Lack of innovation and ideation	Challenges_Industry
Lack of practical experience	Challenges_Industry
Lack of resources contribute to skills gap	
Lack of responsibility and accountability	
Lack of scalability	Challenges_Industry
Lack of social intelligence	Challenges_Industry
Leadership and social influence	Soft skills
Learnership programmes	Recommendations
Learning platforms	
Less demand for accountants	Least important skills
Less demand for analysts longterm	Least important skills
Less demand for bookkeeping	Least important skills
Less demand for finance and accounting professionals	
Less demand for marketing	Least important skills
Less demand for traders	
Less demand lawyers	Least important skills
Machine learning	Digitisation in South Africa
Manual dexterity	Least important skills
Market share retention	
match skill demand	Recommendations Challenges_Industry
Mathematical statistics	Hard skills
Mathematics	Hard skills
Misalignment in employer-graduate expectation	Challenges_Industry
Mobile banking	Digitisation in South Africa
Monitor curriculum fit annually	
Natural attrition	Industry response to skills gap
Need for digital skills	
Need for reskilling	
Need for upskilling	
Need physical bank contact	Soft skills
Networking	
Old rigid infrastructure	
Organisation culture misfit	Challenges_Industry
Organisation inertia	Challenges_Industry
Out-of-the box thinkers	
Outspoken confident graduates	
Personalised banking	
Personality-profile match	Challenges_Industry
Philosophy	Soft skills
Platform banking	Digitisation in South Africa
Point of presence	Challenges_Industry
Poor access to quality education	
Poor alignment of curriculum	
Poor education foundation	

Poor quality graduates	Challenges_Industry
Postgraduate increases employability	
Poverty and Inequality	
Precision	Least important skills
Prioritise disadvantaged groups when hiring	
Privilege	
Proactive graduates	
Problem solving	Soft skills
Product diversification	
Programming	Hard skills
Project management	Hard skills
Proper preschool foundation	Recommendations
Proper skill development plan	Recommendations
Protection of Personal Information	
Psychology background	Soft skills
Qualification-based recruitment	
Quota	Challenges_Industry
Recruit new talent	Industry response to skills gap
Relatable role models	
Repetitive tasks	Least important skills
Resilience	Soft skills
Resistance to change	Challenges_Industry
Retail most impacted	
Robotics	Hard skills
SA digitally experienced	Digitisation in South Africa
SA lags behind in digital skills	Digitisation in South Africa
Same product offering	Digitisation in South Africa
secondary to tertiary transition gap	Challenges_Education
Simple product offerings	
Skill development and retention	Industry response to skills gap
Skill import	Industry response to skills gap
Skill transfer	Industry response to skills gap
Social and emotional intelligence	Soft skills
Soft skills provided by employer	
Soft skills taught by employer	Industry response to skills gap
Software developers	
Sponsorship	Industry response to skills gap
Statistics	Hard skills
Strategic thinking	Soft skills
System engineers	Hard skills
Systematic exclusion processes	
Systematic thinking	Soft skills
Tailor curriculum design	Recommendations
Tech integration and implementation	Challenges_Industry
Technical skills taught by academia	
Technical skills taught by employer	Industry response to skills gap
Technology at the center of digital transformation	Digitisation in South Africa
Technology-driven solutions	Digitisation in South Africa
Tellers	Least important skills

Trading robots	Digitisation in South Africa
Training provided by employer	Industry response to skills gap
Transparency	
Unbundled products and services	
Unemployment impact on economy	
Unemploymentrate amongst skilled graduates	
Update teaching methologies	Recommendations
Vacation work	Recommendations
Vocational training	Recommendations
	Teaching methodologies
Warm culture	
Willingness to learn	
Winter schools	Recommendations
Workshops	Recommendations