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RESEARCH REPORT

The Impact of COVID-19 on Jobs, Skills and Skills Development in South Africa

by

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Submitted in fulfilment of the requirements for the degree of

Master of Management in the field of Governance specialising in Development and Economics

In the Faculty of Commerce, Law and Management

at the

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Supervisor: Prof. P. Pillay

Declaration

I declare that this report is my own, unaided work. It is submitted in fulfilment of the requirements of the degree of Master of Management (in the field of Governance specialising in Development and Economics) in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other university.



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Lucinda R. de Leeuw

02 November 2021

Dedication

Dedicated to my mother, Magdaline, and late father, Reginald.

Acknowledgements

I would like to thank my family for their constant and unfailing support. I thank my friends, colleagues, academic peers, and every person who extended their kindness and thoughtfulness to me during this period. There are those who played a role in guiding and supporting my ideas and research in ways they do not know.

Every little act, word of encouragement, humour, or lengthy conversation I shared with you between 2019 and 2021 likely played a role in the development of my work or resolve—It does not go unappreciated. I don't want to leave out anyone, so I am not naming names.

And thank you to Professor Pillay for guiding me through this important piece of work in my academic career. Every question, comment or point of consideration challenged me to produce work I can be proud of. Your constant feedback and availability when called upon was inspiring and a source of great calm.

Abstract

The scale of the COVID-19 pandemic has no equivalent in modern history. The pandemic has tested the economic and social resolve of the economies across the world. It has altered the world of work and accelerated the adoption of the Fourth Industrial Revolution in society, the economy and across sectors. For South Africa to prepare for the future, the changing world of work and learning must be understood in the South African context. An assessment of the pandemic's implications on jobs, skills and overall skills development is crucial for the economic growth of the country. Skills development and education have always been considered critical in addressing South Africa's triple challenge of poverty, inequality and unemployment. However, the pandemic also presents a window of opportunity to review existing trends in the economy, development and policy to ensure that present challenges do not become permanent, unsolvable problems in the country. It is therefore important to understand the social and economic context of the pandemic on education, skills and jobs—as a means towards sustainable growth—in an unfolding, dynamic and digital environment. One way for the country to carve a path out of the chaos wrought by the COVID-19 crisis is the pursuit of knowledge-creation in crucial areas of development and economics. This research, through the analysis of recent data, identifies pressure points for the South African economy and skills system. The research also identifies areas of opportunity for responsiveness and the sustainability of jobs, skills and skills development in South Africa given the scale of the social and economic change induced by the 2020 crisis.

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List of Acronyms

4IR	Fourth Industrial Revolution
AI	Artificial Intelligence
AAG	Annual average growth
APP	Annual Performance Plan
ATR	Annual Training Reports
BANK SETA	Banking Sector Education and Training Authority
B-BBEE	Broad-Based Black Economic Empowerment
BBC	British Broadcasting Company
CAGR	Compound annual growth rate
CESM	Classification of Educational Subject Matter
CJI	Career Junction Index
CSIR	Council for Scientific and Industrial Research
CV	Curriculum Vitae
DCDT	Department of Communications and Digital Technologies
DBE	Department of Basic Education
DED	Department of Economic Development
DHET	Department of Higher Education
DoEL	Department of Employment and Labour
DPME	Department of Monitoring and Evaluation
DPSA	Department of Public Service and Administration
DSI/T	Department of Science and Innovation/Technology
dtic	Department of Trade, Industry and Competition
ECD	Early childhood development
ERRP	Economic Reconstruction and Recovery Plan
FASSET	Finance and Accounting Services Sector Education and Training Authority
GDP	Gross domestic product
HTFV	Hard-to-fill vacancy
HRDCSA	Human Resource Development Council South Africa
HRDSSA II	Human Resource Development Strategy for South Africa
ICT	Information and Communication Technology
ILO	International Labour Organisation
INSETA	Insurance Services Sector Education and Training Authority
IPAP	Industrial Policy Action Plan
IT	Information Technology
m	million
MICT SETA	Media, Information and Communication Technologies Sector Education and Training Authority
MTBPS	Medium-Term Budget Policy Statement
MTSF	Medium-Term Strategic Framework
NEA	Not economically active
NEET	Not in employment, education or training
NDP	National Development Plan
NGP	National Growth Path
NIDS-CRAM	National Income Dynamics Study – Coronavirus Rapid Mobile Survey
NPC	National Planning Commission
NQF	National Qualifications Framework
NSA	National Skills Authority
NSF	National Skills Fund
NSDP	National Skills Development Plan

NSDS III	National Skills Development Strategy III
OECD	Organisation for Economic Co-operation and Development
OIHD	Occupations in High Demand
PSET	Post-School Education and Training
QCTO	Quality Council for Trades and Occupations
QLFS	Quarterly Labour Force Survey
R&D	Research and Development
SA	South Africa
SAMPI	South African Multidimensional Poverty Index
SAQA	South African Qualifications Authority
SARB	South African Reserve Bank
SARS	South African Revenue Services
SDG	Sustainable Development Goals
SDL	Skills Development Levy
SDLA	Skills Development Levies Act
SETA	Sector Education and Training Authority
SIC	Standard Industrial Classification code
SSETA	Services Sector Education and Training Authority
SSP	Sector Skills Plan
Stats SA	Statistics South Africa
STEM	Science, technology, engineering and mathematics
TVET	Technical and Vocational Education and Training
UK	United Kingdom
US	United States
W&RSETA	Wholesale and Retail Sector Education and Training Authority
WBL	Workplace-based learning
WEF	World Economic Forum
WFH	Work from home/ working from home
WP-PSET	White Paper for the Post-School Education and Training
WSP	Workplace Skills Plans

1. **Introduction**

At the beginning of 2020, the world had been operating at its usual pace; everything was conventional and certain. By the end of the first financial quarter (Q1), the world had been overcome by the global health pandemic caused by the COVID-19/coronavirus disease. The virus's rapid spread pivoted the world's perceived normalcy into something that, until then, had been unprecedented in the 21st century.[1] Research (WEF, 2020) shows that the twin developments of 2020/21—COVID-19 and the rapid advancement of the Fourth Industrial Revolution (4IR)—are of major consequence for the future world of work and skills development. The onset of the pandemic brought unexpected disruptions to labour markets, accelerating the adoption of the 4IR, and thereby deepening pre-existing inequalities across labour markets and reversing employment gains made since the global recession of 2008/9.

The crisis called upon the resourcefulness and resiliency of leadership at the government, business and individual levels. The full economic and social extent of the crisis is not yet determined at the time of research. What is certain, however, is that the way forward will require the adaptation and application of new thinking, doing and other resourceful faculties in economies across the world.

This study is interested in the wide-ranging economic and social impact of the pandemic in South Africa—more particularly, the impact on key economic development policy and economic growth enablers, including jobs and skills. Skills development is considered a significant driver of sustainable growth, which makes the pandemic an important moment in which to consider the current status of the country's skills landscape and anticipate the implications on national skills policy and planning as impacted by the crisis.[2] This area of interest informs the research focus of this study.

This thesis was compiled through qualitative and quantitative research using secondary data collection methods as a source of information. The data collected provided gainful insight into

[1] The COVID-19 pandemic is likened to the Spanish flu, which recorded between 50-100 million deaths and devasted the global economy between 1918 and 1920 (McKibbin & Fernando, 2020).

[2] This research study is informed by the definition of 'skills development' as "all education and training which is aimed at the workplace" (Allais, 2012).

the study's area of investigation: the impact of the pandemic on jobs and skills in South Africa. Secondary research proved to be a suitable method to uncover and understand the magnitude of the changes, trends and phenomena around the current crisis (Heaton, 2004; Long-Sutehall et al., 2011; Johnston, 2014).[3] Due to the government-enforced social distancing measures to contain the spread of the coronavirus, the selected research method, at this time, was both practical and sensible.

It is commonly perceived that the country's current skills pipeline cannot cater to the fast-paced demands of a changing global economy. However, the impact of the crisis is not only negative. The coronavirus crisis is also an opportunity to drive change towards innovation and new forms of intelligence.

The crisis also calls for leadership that is more collaborative, inspiring and imaginative at the governance, industrial and policy levels. While the crisis will continue to unveil the inadequacies in current and traditional approaches, it can also eliminate the resistance to change that is inherent in the political economy of South Africa. It is expected that everything that has persisted in the social, economic and political fabric of many countries will be impacted. As such, the population and the leadership of South Africa are forced to face and pursue new possibilities. What exactly those possibilities will entail, however, is still uncertain. Since the virus and the scale of its crisis is novel, the current knowledge of the economics of COVID-19 is deficient (McKibbin & Fernando, 2020; Rasool, 2020a). Research towards more complete knowledge and understanding, however, is possible and needed now more than ever.

The current policy context of South Africa's skills development system is guided by the Skills Development Act (SDA) of 1998, which seeks to develop the skills of the South African workforce and ensure that opportunities are created for skills acquisition through employers, workplaces and employees (Government Gazette, 1998). The workplace becomes an active learning environment for employees to obtain skills that are demanded in the labour market. The ultimate aim is that skills development will produce a skilled and capable workforce that

[3] Secondary research can also be referred to as 'desk research' and uses existing resources as a source of data for analysis. The more commonly referenced 'secondary research' will be used in this research paper with the understanding of the provided definition.

can contribute to the national developmental imperative to create employment and reduce inequality and poverty.

The purpose of the SDA is achieved through an appropriate institutional and financial framework. (Government Gazette, 1998). The framework consists of skills levy organisations such as the National Skills Authority (NSA) and the National Skills Fund (NSF). These organs play an essential role in planning, governing and administering the skills development levy-grant scheme through various skills development interventions, programmes and partnerships with post-school partners.

Another component of the SDA framework is the Sector Education and Training Authorities or SETAs. There were 21 SETAs as of March 2011, which are being restructured between 1 April 2020 and 31 March 2030 (DHET, 2019a). The SETAs are responsible for planning, managing and facilitating sector skills planning within the framework of the national skills development strategy (Government Gazette, 1998). The SETAs also establish the learning programmes that will benefit the country's economic sectors via the supply of skills to the labour market. The SETAs' role in sector skills planning will be central in determining the impact of the coronavirus crisis on SA's national skills planning in the medium term (2020–2025). This was assessed against key policy plans and strategies in the development of this research paper.

Skills development is indispensable in South Africa as it not only seeks to achieve a skilled and capable workforce—it also assists in building a fair, equitable, non-racial, non-sexist and democratic post-school education and training (PSET) system in the country (DHET, 2013). Through the White Paper for Post-School Education and Training, the skills development system is expected to be responsive to the needs of individual citizens, employers in both public and private sectors, as well as broader societal and developmental objectives (DHET, 2013). The policy context of the country's skills development environment, which is explored in this research paper, implies that South Africa has developed a seemingly capable skills development system. Of salience are the sustainability of this system and what it achieves against the demands of the COVID-19 pandemic and the evolving world of work.

1.1. Problem statement

The response to the skills demands created by the pandemic and related forces, such as the changing nature of work and the advent of the 4IR, must be understood in the South African context. The pandemic is affecting the capacity of the country's human capital. An assessment of its implications on the jobs, skills and skills development of the country is thus important to determine the economic sustainability of the country and its workforce, which are now required to be simultaneously adaptive and dynamic. Knowledge-creation in crucial areas of economic development can allow the country to pave a path beyond the chaos wrought by the crisis. In consideration of this significance, the intent of this research is to generate insights that will lead to identifying areas of opportunity for the sustainability of jobs, skills and skills development in South Africa given the social and economic scale of the 2020 crisis.

Expertise on the economics of the crisis is continually unfolding and under development. Thus, increased research in key areas of knowledge production is crucial at this time. Despite the uncertain nature of the crisis, knowledge can be achieved by defining the current problem and its implications through research based on available data, trends and insights.

It bears emphasis that the topic of this research is a novel and recent occurrence. The scale of the crisis is a moving target. Therefore, a narrow research focus would not have been feasible at the time of research as various economic sectors and functions were still locating and assessing direct impact. A broad-based impact assessment appears to be more researchable and plausible for this research undertaking, i.e. mid-2020. Moreover, existing literature, policy, reports and statistics on South Africa's skills environment, the world of work and the 4IRcan be readily accessed and utilised for research purposes.

1.2. Research question

The research question is this: How is the COVID-19 pandemic impacting the jobs, skills and skills development landscape of South Africa?

1.3. Research objectives

The study aims to achieve the following objectives.

1. Determine the influence of the pandemic on the current skills needs of South Africa;
2. Assess the dynamics of South Africa's skills supply and demand;
3. Observe the impact of the crisis on national skills policy and planning. The focus will be directed to the implications of the crisis on:
    - the national skills planning fourth phase (2020–2025); and
    - the objectives of the National Skills Development Plan (NSDP) 2030;
4. Identify the skill sets of the future; and
5. Establish South Africa's readiness concerning changing skills needs.

2. Literature review

In alignment with the research topic, this literature review contextualises the area of investigation. The review examines current issues as it concerns the impact of the pandemic on South African businesses and, by implication, the country's skills environment. Critical interpretation is applied to the texts reviewed by evaluating strengths and weaknesses in the literature where relevant. The literature review, based on the nature of the study at this time, references a variety of sources, including journals, respected scholars in fields relevant to the topic of examination, reports, credible websites and e-books. To give a general overview, most of the literature reviewed relates to qualitative assessments, while the economic literature referenced uses mostly quantitative modelling and statistics for their findings.

2.1. Economic impact of the pandemic

South Africa's annual economic growth rate contracted to -7% in 2020—this negatively impacted employment, with significant job losses seen during the early months of the lockdown (Stats SA, 2021a). The growth rate is projected to show gradual recovery in 2021 by 3.6%, which should recover some of the job losses experienced (SARB 2021). Economic growth in 2021 will be determined by the success of containment measures and fiscus recovery following the complete cessation of lockdown levels. Statistics South Africa's (Pillay et al., 2020) business impact survey conducted between March and April 2021 on 2 182 tax-paying businesses across industry revealed that 89.6% of SA business had a below-normal turnover in the lockdown level 5 period.[4] Nearly 37% of businesses expected to lay off staff in the short term, and over 45% expected a reduction in their workforce following the reference period (Pillay et al., 2020).

In terms of survival, just over 55% indicated that they could continue business for one to three months without turnover; many indicated they were not operating at full capacity at the time of the survey (Pillay et al., 2020). Moreover, while over 36% of businesses indicated that they would be laying off staff, only 0.7% indicated that they would recruit in the short term (Pillay et

[4] The Stats SA survey was designed as an experimental study. The aggregated results are interpreted from the qualitative survey, and excludes micro businesses (Pillay et al., 2020).

al., 2020). These figures will adversely impact (un)employment rates in the short term. The job market will become increasingly competitive as the country faces more job losses—the ramifications on which skills will be favoured (or in high demand) in a growing pool of job seekers will be important in the months following the cessation of lockdown measures. More recently, in June 2020, an unemployment rate of 30.1% (over 7 million people) was recorded for quarter two (Q2), with the youth (ages 18–24) being the most vulnerable and impacted (Stats SA, 2020a). The task of addressing unemployment is a policy issue; however, due to the unique situation of SA's high unemployment rate, developmental issues such as education and skills development cannot be separated from the employment/unemployment narrative.

Furthermore, with business impacted and as the pool of unemployed jobseekers grows, the demand for skills and occupations will inevitably evolve in accordance with the pandemic/lockdown measures and the realisation that 4IR capability and virtual work are the unavoidable future. This leaves more people in the unemployed pool with skills that are quickly becoming redundant and possibly obsolete in the near future. Many of these individuals went through the education and training system to obtain so-called relevant, critical and scarce skills as recently as 2019. Their skill set is newly attained, but quickly becoming irrelevant—this will result in a skills development issue, aggravated by the pandemic, that the South African PSET system had not envisaged. As identified, the need to enhance and develop new skills will be compounded by a growing unemployment rate and increasing desperation among the citizens of the country. The pandemic has brought more than economic and health problems to an already socially and politically volatile country. Will the national labour market contend with global competition in terms of demanding new skill sets—or will the economic climate require dwindling unemployment to be prioritised above developing skills?

2.2. The skills development issue

Skills and education have always been considered critical to addressing SA's triple challenge of poverty, inequality and unemployment; the associated challenges are interlinked and mutually reinforcing (Wilson et al., 2004). The preceding sub-section outlines this challenging relationship between economic welfare and employment. The pandemic will only further highlight the hard truths about this very South African predicament. The immediate response

from South African businesses upon the initial lockdown in March 2020 was that jobs would be lost without economic activity, sparking fears about job security among the working community. Hanushek (2009) argues the value of skills as essential for an economy's production and invention levels; this assigns the individual as a subject of the economy and not as an active participant in the economic market.

The COVID-19 pandemic has shown that, for the most part, individuals do not have much agency in the economic market when greater external forces are at play. Businesses' failure or inability to sustain themselves comes about because of industry's reluctance to be adaptable and responsive to change (IDC, 2019; Carlsson-Szlezak et al., 2020). While workers and qualified jobseekers may have the skills previously required to be employable and competent, they now face a two-pronged challenge: the current labour force may show skills gaps as new skills are demanded, and the enormous economic shock imparted by the pandemic in a country that was already in a technical recession. These challenges will put pressure on the skills development system to reskill, upskill and train people in new occupations to ensure their employability and relevance to the labour market.

It is commonly believed that skills and education are tied to economic development. Hanushek (2009) argues that the relationship between economic growth and labour force quality is important and often takes priority over human capital development.

Vally and Motala (2014), however, refute the idea of an intrinsic relationship between education and society. Their literature argues that the concept that education, skills and economic development are inextricably linked narrows the skills discourse and ties it to economic ends ignoring the value of social justice, transformation and democratic citizenship. Moreover, Vally and Motala criticise outcomes-based models for education and training, as seen in the National Qualifications Framework (NQF) level system, and this is centred around the same idea that the quality of individuals' learning and knowledge in the labour force is linked to the economic growth of a country (Ngcwangu, 2014). The critique infers that outcomes-based models focus on "what people can do" and exclude other knowledge they may have (Ngcwangu, 2014). It is further argued that these neoliberal approaches to the education and training system often

produce a workforce that is required to be multi-skilled and flexible, catering to specialised international markets (Ngcwangu, 2014).

Such contending ideas on skills development are considered in the analysis of South Africa's approach to skills development and economic growth. Skills development in this research study refers to *all education and training which is aimed at the workplace*.[5] An inquiry into South Africa's approach was taken to discover whether skills are a commodity for labour or whether it is an investment in the individual to be a productive member of society, but still an autonomous being. The pandemic will reveal what is prioritised in the South African economy. Another contentious issue was reviewed, and that is the importance of continuous skills development initiatives in a country adversely affected by rising unemployment. The relevant data were gathered and interpreted to determine the skills development priorities of South Africa prior to COVID-19 and how priorities may shift post-COVID-19. This context will be important to understand how the idea of 'future skills' and the demand for such skills will be treated in SA in the short to medium term (effectively addressing research objectives 1, 2 and 4).

South Africa's approach to skills development was conceptualised around the idea that elevated education and skills levels are enablers of economic growth, and that skilled people can be absorbed into employment and are also able to create jobs (Kraak et al., 2013; Powell et al., 2016). Therefore, employed and employable people contribute to the economic activity of the country, and skilled people can become self-employed. Employment and the employability of the population are considered to be a structural exercise for economic growth because they help alleviate the challenges of unemployment, poverty and inequality in the country (Kraak et al., 2013). This take on skills development stems from the view that skills shortages are one of the leading causes of unemployment (Allais, 2012). Education policy and skills development in SA, therefore, aim to combat the sustained unemployment rate of the economy, which has been above 20% since 1997, based on the premise that elevated skills levels enable economic growth (McGrath, 2010; BusinessTech, 2015; Reddy et al., 2018a).

[5] As referenced by S. Allais (2012, p. 633).

According to more recent research on SA's skills policy system, it appears that producing higher- and intermediate-level skills is prioritised over employability and core competence skills (Reddy et al., 2018a). This agrees with the narrative already outlined here, which is that skills development is orientated towards servicing the labour market for sustaining a broader imperative—that of the national economy. Research, according to Reddy et al. (2018a), says that employability and competency skills are "critical building blocks" for further development and promote the ability to adapt to a changing labour market. The impact of the pandemic already hints at changes in the labour market.

The pandemic, as this research study seeks to determine, will reveal the shortcomings and successes of SA's skills development system as well as its response to the impact of the pandemic. Will it be viable? Will the plans and strategies already in place for the medium and long terms be effective in a post-COVID-19 world? At the time of writing, expert knowledge on the economics of the pandemic is still unfolding (McKibbin & Fernando, 2020; Rasool, 2020a). Therefore, there are no certainties. Nonetheless, it is helpful that history can always be relied upon to inform current events. This study compares historical records against current records and information to determine the likely outcomes of SA's skills environment between 2020–2025 (the national skills planning fourth phase, as per research objective 3).

Rasool (2020a) advises that the pandemic will "decisively" change SA's skills planning agenda in the short to medium terms; continued active policy actions and efforts should not be hindered by the pandemic. However, the final submissions for sector skills plans for 2020/21,[6] as implemented through SETAs and captured through industry insights, were postponed to a later date in the year as a result of the pandemic and lockdown restrictions.

Further to SA's skills development approach, it is commonly understood that individuals with a tertiary level of education (NQF level 5 and above) stand a better chance of employment. Stats SA (2020) contends that education remains key to young people's prospects of improved livelihood, as well as the improvement of the national labour market. This emphasises the idea

[6] Skills planning provides insights about the labour market and provides signals to the education and training system (Marock., 2012; Powell et al., 2016).

that education and skills as an instrument of human capital development enable the economic growth of a country.

Research on the South African skills system suggests that skills policy should foster “holistic human development”, which includes focusing on employability as well as supporting skills development that meaningfully impacts the lives of South Africans (Reddy et al., 2018a). The research does not disregard the challenges of the national economy, which include participating in a globally competitive environment that requires a high skills base while faced with the local context of low-wage jobs that absorb a large number of unemployed or vulnerable persons (Reddy et al., 2018a). Moreover, South Africa is mostly characterised by low education levels; few people have a higher education or tertiary qualification, which means that, according to the Stats SA inference, not many people in the country are able to attain quality livelihoods through better employment. The labour market continues to demand high-level skills while the country has a surplus of low-level skills or workers (Reddy et al., 2018a). This creates a mismatch between supply and demand in the labour market; this discord in what the economy needs, particularly in the advent of an advanced industrial revolution (the 4IR), will only intensify because of the pandemic.

Many of the researchers referred to earlier contend that SA’s interpretation of skills development and economics is not appropriate, for many reasons, but largely because it assumes that investments in higher education will have trickle-down effects to combat the triple challenge of unemployment, poverty and inequality (Reddy et al., 2018a). It is also argued that while the development of skills is necessary, it is not sufficient for employment and that South African skills legislation must review this stance—perhaps consider a growth strategy over a skills policy for economic improvement (Reddy et al., 2018). Allais (2012) suggests that for education to meet the long-term needs of an economy, demand-driven skills needs must be secondary to educational outcomes at various points in the education and skills pipeline. Kraak (2005), in agreement, states that privileging high skills in SA is inappropriate and is a singular human resource focus because it ignores the structural conditions inherent in the country. With a broader outlook, McGrath (2010) argues that education is good but not *that* important for development when compared to other social, political and economic issues, such as trade, conflict, investment and governance. The role of education and skills in development and

economics is indeed complex, particularly in contemporary society where the factors that influence demand are dynamic and unpredictable and can either enable or inhibit successful developmental objectives.

The pathway from post-school education and training to entry into the labour market is poorly articulated in SA, at all levels of the skills development pipeline, because it disregards the socio-economic and structural inadequacies inherent in the country (Kraak, 2005; Allais, 2012; Powell et al., 2016; Reddy et al., 2018a). Skills deficits are present at high, intermediate and low skills levels, and these have to be addressed appropriately if SA is to realise its goal of achieving economic empowerment through education and skills development. Kraak (2005) acknowledges that comparative advantage at the global level is achieved through high-quality and value-add labour and services which call for a higher-skilled workforce, and that this puts pressure on national economies to meet such demands to remain competitive globally. However, he argues that the unique characteristics of national economies must not be ignored when addressing 'skills crisis' issues (Kraak, 2005). For multi-layered, developing countries like SA, such challenges can be "exaggerated and misplaced" when the context is ignored, resulting in a "narrow and limiting" perspective of skills development as an instrument of social and economic change (Kraak, 2005; Powell et al., 2016). This argument is salient and will bear consideration in the current crisis when trajectories around labour market needs, future skills and the world of work will be led by more developed and advanced global perspectives. South Africa's relationship with education, skills and economic growth is paradoxical and complex and requires in-depth analysis. Reddy et al. (2018a) suggest that SA's dilemma is situated in how to respond to the diverse sets of development needs, occupational pathways, and by implication, changing labour market needs to achieve inclusive growth and positive development trajectory while minimising job losses and unemployment all at once.

The ideas explored in this sub-section are supported by the framework for analysis that this research study follows and which is outlined next.

2.3. Framework for analysis: Human Capital Theory and Neoliberal Theory

Objective 2 of this research study aims to assess the alignment and, by implication, the relationship between the supply of skills and the needs of an economy. Human capital theory discourse is central to this inquiry as the skills supplied to an economy are based on human capital development interventions.

Human capital is defined as the knowledge and skills that enable work that is of economic value to be performed (Spring, 2015). Spring traces the concept to 1776 where it is illustrated in Adam Smith's *Wealth of Nations.* It will be constructive to observe to what extent skills planning in South Africa is informed by human capital theory and underlying connotations (i.e. neoliberal ideologies). Unemployment, as argued by Vally and Motala (2014), is not a problem of lack of worker supply, but rather a structural problem of capitalism realised through neoliberal theory. This function of neoliberalism is a persistent idea in development economics discourse and warrants attention in this research study (Kruss, 2004; Holborow, 2012; Kotzian, 2013). The theories identified will give insight into the country's approach to adapting to changing skills needs following the pandemic.

In addition, in Vally and Motala (2014, pp. vii-viii), the concept of human capital as linked to neoliberal economics is interpreted as stripping the human element from skills and education priorities. The publication conveys that in the 1950s and earlier, labour economics was intrinsically sociological, based on the real world, collective bargaining and public policy (Vally & Motala, 2014). Meanwhile, the 1960s, because of neoliberal ideologies, birthed the idea that labour is a commodity, introducing the concept of human capital theory in development economics. Since then, education is used in an economy as a means to invest in the skills that make individuals (the citizenry) more productive and employable (Kruss, 2004; Holborow, 2012; Vally & Motala, 2014). To a large extent, this is true.

Because of economic determinism,[7] education and skills attainment are therefore perceived as a gateway to employment in contemporary society (Thomasberger, 2013; Wilson et al., 2004). This perception is ingrained and socialised into contemporary society and generally goes

[7] Economic determinism qualifies that "education leads to skills, skills lead to employment, employment leads to economic growth, economic growth creates jobs and is the way out of poverty and inequality" — Steven J Klees, professor of international education policy (in *Education, Economy & Society,* 2014).

unquestioned. McGrath (2010) asserts that comparative research across rich and poor nations reveals that individuals are completing ever-higher levels of education to succeed in the labour market. This leads to an oversupply of qualifications that outweighs demand, which in turn leads to unhappiness in education for the individual when fulfilment through education and learning is not achieved (McGrath, 2010). The link between education and the economy likely enhances this level of unhappiness for individuals. For economies such as South Africa, where high rates of unemployment are persistent, the link between being skilled and having economic value is unassailable. In addition, with every financial crisis and economic recession, people become more reliant on advancing their education and skill sets to either obtain employment or remain employable in the event of large-scale job losses and replacements.

Notwithstanding, at an individual level, capacitating oneself with an education and skill set is valuable and linked to the human need for competence (actions, skills and abilities) and self-determination (Deci & Ryan, 2004; Spring 2015). Literacy, numeracy, problem-solving and critical thinking skills are not only cognitive tools for survival but are an intangible asset that extends beyond the reach of any market economy. Beyond the individual's need for autonomy, the growth of an economy is closely dependent on the "synergies" between new knowledge and human capital (Becker, 1993; Holborow, 2012).

2.4. International perspective

South Africa's approach to skills development is largely motivated by its unique historical and political challenges and should be interpreted differently from the skills development approaches of other regions (Powell et al., 2016). For example, while successful, the South-East Asian and European models are not the most appropriate case studies for South Africa to compare its strategies and policies against (Powell et al., 2016). The economic structure and structural dynamics of these regions are vastly different and too complex for simple comparison. However, this does not preclude them from acting as examples for countries such as South Africa to draw lessons and guidance from. Under the South-East Asian development state model, the state drives human resource development processes and thereby determines growth patterns and pathways for the country—this is a top-down approach (Powell et al., 2016). In contrast, the European model takes an inclusive approach where the market or social partners drive decisions over skills development (Powell et al., 2016). Moreover, the

developmental state approach, generally, identifies priority sectors for future development as well as the skills that need to be produced and takes decisions from there (Powell et al., 2016).

The South African model is a hybrid approach where elements are market-driven and decisions are left to providers (Powell et al., 2016). In the South African skills planning approach, the DHET, since 2014, in conjunction with various stakeholders, including SETAs' involvement, collates and publishes a biennial iteration of the List of Occupations in High Demand (OIHD) for public and industry consumption (DHET 2014a; 2018).[8] The list is a compilation of the top 100 occupations identified to be "in demand" during that period and is informed through market analysis and relationships with trade associations and industry role-players (DHET, 2018). The purpose of the list is to inform human resource planning and development, among other objectives, towards addressing skills shortages and priority occupations in the country (DHET, 2018; Reddy et al., 2018b).

In recent years, skills development mostly centred around the Sustainable Development Goals (SDGs) 2030 agenda for many national governments globally (Comyn, 2018).[9] Technical and Vocational Education and Training (TVET) and lifelong learning are given priority in the education development agenda (Comyn, 2018; Sakamoto, 2019; UN, 2020). This is driven by persistently high levels of youth unemployment across the world, as well as the changing nature of employment, increased skills migration, new skills demand, skills mismatches and the introduction of new technologies (Comyn, 2018; UN, 2020). The 2030 SDG agenda views education and skills development as a transformative policy to achieving inclusive, long-term and sustainable economic growth (Comyn, 2018). In line with growing skills development literature, the global imperative towards education and skills development follows the same agenda, i.e. to be responsive to labour market needs and the employability of individuals (Comyn, 2018, Sakamoto, 2019; Jagannathan et al., 2019; UN; 2020).

Labour market trends show that different types of work will be prevalent in the future due to increasing educational attainment levels; advanced technology such as data mining; the 4IR

[8] The OIHD list is officially called "The National List of Occupations in High Demand" (DHET, 2014a).
[9] The Sustainable Development Goals (SDGs), set by the United Nations General Assembly, is a collection of 17 global goals and acts a blueprint to achieve a sustainable future (UN, 2020).

and digital transformation; disruptive technologies such as the Internet of Things (IoT), artificial intelligence (AI) and robotics; global value chains; the gig economy; changing employment models and work arrangements—all of which existed before the current pandemic (Comyn, 2018; Sakamoto, 2019; Jagannathan et al., 2019). The question of how education and skills systems will respond to changing demands has been a part of the global discourse in the last few years, but the conversation will continue to intensify because of the pandemic. The rapid pace of technological, demographic and socio-economic disruption, according to Comyn (2018), Sakamoto (2019) and Jagannathan et al. (2019), will transform industries and business models, which in turn will affect skills needs in terms of demand, resulting in a shortened shelf-life of existing skill sets for employees. The capacity of skills systems to understand such quick-changing demands and to anticipate future skills needs will indeed be challenging and demanding. The pandemic (associated with working from home, e-learning, virtual conferencing and health risks) will only escalate the pressure on national skills development systems to become adaptable and responsive to unfolding and unforeseeable demands.

What has emerged from the literature and issues outlined thus far, beyond the mortality and morbidity of the COVID-19 pandemic, is the macroeconomic devastation in the pandemic's wake (McKibbin & Fernando, 2020). Gollier and Straub (2020) contend that the scale of the pandemic has no equivalent in modern history. The version of work that was the norm before COVID-19 is now degraded, and new ways of value-creating activities have had to be forged as a result (Gollier & Straub, 2020). This research study, in accordance with research objective 4, investigates what those new ways are and what they mean for South Africa's readiness for future demands.

With everything considered, the coronavirus crisis presents an opportunity to review the skills development direction of South Africa based on current, unfolding evidence. The research inputs and outputs will be compelling to explore. Finding definitive answers to appropriate skills policy responses to the demands of the pandemic is not the goal. Rather, discovering the potential of SA's human capital to be dynamic and resilient under the guidance of its skills development model is the defining point. The next section details the research approach for this study.

3. Research approach

The qualitative research approach adopted for this study is commonly used to explain, understand and interpret social science research. It was found to be the most suitable approach to answer this study's research question, namely, to determine the impact of the COVID-19 pandemic on jobs, skills and skills development in South Africa. The approach enabled an in-depth enquiry into the economic consequences of the pandemic on the skills needs of the country, as well as the assessment of SA's readiness for a changing world of work. The implications of the crisis for skills policy and planning in the medium to long term could also be interpreted.

The approach is ideal in several ways: it is useful for dealing with information explosion; it enables dialogue and debate; and it allows for the development of evidenced-based practice and policy by bringing research to decision-makers, for example (Major & Savin-Baden, 2010). Moreover, the research question and objectives of the study adequately guide the research approach and methods adopted for the study.

Therefore, this study used the secondary data collection method to conduct both qualitative and quantitative research to answer the study's research question and objectives.

The social distancing and safety measures effected through lockdown restrictions, locally and globally, as a result of the COVID-19 pandemic, limited access to people and information and, consequently, also called for novel data collection and methodological approaches. For this reason, creative yet viable ways of collecting information were employed in the conduct of this study. Given that the research question and its objectives were substantively explored, the secondary data collection method proved to be an adequate and resourceful means of conducting this social science research study. This method of data collection also gave the researcher access to wide-ranging, up-to-date quantitative and qualitative research for findings and analysis.

The possible limitations of secondary data collection methods were considerably circumvented as the world turned to online and virtual spaces for data, information and knowledge sharing.

Online and electronic platforms became requisite in 2020 and early 2021 for navigation and access to information, particularly on the pandemic and related developments. This shift to online, electronic and virtual spaces also provided first-hand insight and experience for the researcher into the changing nature of work and learning, which informs a key area of this study's inquiry, namely, the advent of the Fourth Industrial Revolution in the work and skills space. Therefore, while the researcher relied on a breadth of research resources for the validity and credibility of the study, the nature of the shifts that took place during the research period deeply informed her perspectives and understanding of the research inquiry.

3.1. Research tools and their application

As determined, this study makes use of qualitative and quantitative data collected through secondary research. Secondary research typically involves the use of existing data and material to conduct the research study (Long-Sutehall et al., 2011; Johnston, 2014). The data, information and literature used were collected, summarised and collated through desktop means, which supports the selected research method. The breadth of data, information and knowledge on electronic and online platforms in the present day is vast, easily accessible and dynamic, and serves the purpose of this study and its objectives. Technology advancements, particularly digitisation, allow for large amounts of quality and credible data and information to be collected, documented and archived electronically and be accessed through online and virtual platforms (Heaton, 2004; Johnston, 2014).

Moreover, the use of secondary data, including the extraction and analysis of raw data from electronic databases, proved to be flexible and cost-effective; it was also systematic, resulting in its application being thoroughly viable and producing sound answers (Long-Sutehall et al., 2011).

In the period of this research (2020/21), the chosen method of data collection was also within the regulations of the government-mandated social restrictions put in place for safety and health reasons. Furthermore, given the context of the study, which was to explore the demands of the pandemic on our skills and resourcefulness, employing secondary data collection methods and

analysis was both relevant and progressive. It was also the most productive approach to getting thorough, timely and insightful evidence to present the research enquiry.

The secondary data and information relevant to this study include government documents; industry reports; skills policies and strategy documents; journals; current events publications; e-books and library books. Although defined as a qualitative study, the research constitutes findings and analyses of national and international statistical and economic data. The selection of data sources, shown in section 3.3, was determined based on the quality, relevance and comprehensiveness of the data and information reported. Careful consideration was applied in the selection of data and information used throughout the study. This was a priority for the researcher as the quality and integrity of the information sources would influence the quality of findings and analyses in this research study.

Secondary research as a data collection tool proved to be a powerful choice for this study given the events of 2020. The volume of data and textual information required for this study, specifically to answer its research questions, is not easily attainable through primary research. Findings gleaned from a different research tool, in the case of this research study, would render subjective, incomplete and limited information, incapable of application to a broader and national context. The chosen tool also provided in-depth and international comparative insights which would have been otherwise unobtainable. The choice of research tool and method, then, was both suitable for the study and able to adequately support the area of investigation.

3.2. Sampling

The nature of this study did not necessitate any sampling.

3.3. Process of analysis

The secondary data and research materials for the study were collected through electronic and online platforms. The criteria that determined the selection of material for the study were dependent on how closely they related to the central concepts of this research enquiry. These research materials include, but are not limited to, literature on the COVID-19 pandemic and resulting economic crisis; literature on the labour force impact of the lockdown South Africa;

information based on qualifications and higher education completions; unemployment and employments statistics; macroeconomic indicators; raw datasets derived from up-to-date economic data sources; and qualitative and quantitative insights from government and industry relating to labour market trends, skills needs and future skills.

Key quantitative information sources include:

- Quantec economic data
- Statistics South Africa Quarterly Labour Force Survey (QLFS) statistics
- Statistics South Africa gross domestic product (GDP) data
- National Income Dynamics Study – Coronavirus Rapid Mobile Survey (NIDS-CRAM
- Global and South African data from the International Labour Organisation (ILO) and the Organisation for Economic Co-operation and Development (OECD) for country profiles and economic, labour and skills data
- South African government data on economics, labour, finances and budget (National Treasury, South African Reserve Bank, South African Revenue Services)
- South African Multidimensional Poverty Index (SAMPI)
- Industry research and data (PwC, McKinsey)
- World Economic Forum data
- World Bank data

Key qualitative information sources include:

- National legislative, strategic and policy documents
- South African government on economic policy, development and governance
- National social and economic development frameworks, plans and papers
- The Department of Higher Education, including the PSET Research Repository
- SETAs' research and sector skills plans
- Literature on the post-school education and training system in SA and globally
- Literature on skills and skills development in SA and globally
- Academic and/or scholarly journals, articles and publications
- National and global COVID-19 pandemic research and literature
- 4IR research and literature

- World Economic Forum research
- World Bank research
- Industry research and insights
- Research institutions and think tanks
- OIHD lists, Career Junction Index and related jobs surveys

The quantitative and qualitative data selected for data analysis and interpretation in this study are widely known and used for data, policy and research on economies, education, employment, unemployment, GDP, government, technology, jobs and society, amongst other key areas. These sources of information were key in providing a well-documented, credible and reliable interpretation of the pertinent issues underlying this thesis, namely the pandemic and its economic impact on those areas listed.

The use of statistical data and analysis helped to understand and quantify the broader and contemporary trends related to the study's area of investigation, i.e. GDP, jobs and labour force impact, amongst others. Moreover, quantitative data, used mostly in Chapter 5 under "Findings and Data Analysis", helped to characterise the impact of the pandemic in the study's area of investigation more substantively while enriching the qualitative perspectives and findings in the research.

The use and analysis of textual context from a variety of secondary qualitative sources add value and depth to the central themes of this research study. Qualitative information is used in Chapter 4 to provide context to South Africa's skills development landscape, as well as in Chapter 6 under "Analysis" and "Conclusion". As such, the triangulation of quantitative and qualitative research used in this thesis results in a meaningful and thorough interpretation of the study's area of investigation.

Finally, because the use of existing datasets and information accelerates the pace of the research process, this study could be published in a reasonable time without having deviated from its research enquiry.

3.4. Limitations, feasibility and positionality

The unique limitations and feasibility issues concerned with using secondary research are recognised. The secondary data and information used in this research are produced and developed by other researchers, institutions or publications for purposes different to the specific interest of this research project. In some instances, formal requests for reports and documents were made, particularly where government agencies are involved. As such, careful assessment and selection of data and data sources were always pursued in the secondary data collection (Long-Sutehall et al., 2011).

While secondary data—where statistical data is involved—lacks the capacity for follow-up questions or gathering additional raw data where needed, this was not a major impediment for the purposes of this study. However, it did manifest a lack of control over the data for the researcher. Related to this is that the researcher had no sway over sampling issues, missing responses or biases evident in raw datasets. However, this is not a disadvantage that cannot be overcome. Carefully matching the research question to existing data was crucial and ensured that these limitations did not compromise the study's findings and integrity (Johnston, 2014).

Furthermore, the cost-effectiveness and convenience of secondary research and analysis allowed the study to readily adapt and revise strategies where obstacles may have arisen. This was particularly evident during the varying COVID-19 lockdown levels throughout the research period. The inherent limitations of secondary research, when critical evaluation is applied, can be outweighed by the research method's apparent advantages, and this was the experience of the researcher. Secondary data collection was particularly appropriate under the precarious conditions caused by the pandemic— proving again that the chosen research design was both suitable and sensible.

Although no primary data were interpreted, the researcher was aware of their positionality in conducting the research in terms of understanding and interpreting the research as a specialist in skills and enterprise development. Personal views, opinions and perspectives did not affect which data was collected or how it was interpreted.

3.5. Ethics

This study did not require unusual ethical considerations; sources that necessitate data collection from the field were not used. However, the study was approved by the University's ethical standards for research before research commenced.

3.6. Validity, reliability and dependability

Based on the research approach, this study can inherently not be generalised. However, the analysis and interpretation applied in the study, which includes the triangulation of qualitative and quantitative research, makes the study's method and findings sound.

The research methodology applied in this study allowed the researcher access to large, high-quality datasets and information. This resulted in substantial, in-depth findings, which increased the chances of creating a meaningful study. As the adopted research method is convenient and inexpensive, it equalised the opportunity for the researcher to produce a rigorous, substantive research study within the means available to the researcher. Critical evaluation—i.e., questioning when, why and who collected the existing data—applied in collecting, interpreting and analysing the secondary data helped to achieve this (Heaton, 2004). Awareness of the inherent biases in the secondary sources further enhances the credibility of the research.

Moreover, the researcher, as far as possible, relied strictly on relevant, credible, consistent and complete data and research materials to conduct the research and formulate her findings. The suitability and adequacy of the data collection method and research design are equally important and were carefully heeded for this study. Through identifying the strengths and weaknesses of the selected methods, the researcher took sensible measures to assess and successfully mitigate the possible risks and obstacles that may have arisen during the research process. The use of reputable secondary data in this thesis reliably achieves its outcomes by using value-driven information for value-creating research.

4. Background to skills development in South Africa

This chapter develops an understanding of the social and economic dynamics of education, skills and unemployment in the country. It also provides a more insightful background and overview of the legislation, policy and practices that inform the current skills development system and approach in SA than what was introduced in earlier chapters.

During the apartheid regime, skills and training largely consisted of low skills production supported by an unequal public education system (Allais, 2012; Powell et al., 2016). In the later years of this regime, skills training would shift from a 'low skills' framework to an apprenticeship system motivated by mechanisation and the mass production practices of the 1970s and 1980s. This type of work required competency-based skills (Allais, 2012; Powell et al., 2016).

In 1994, under the new democratic regime, skills development adopted a more inclusive approach to address past imbalances and create a more employable workforce (Allais, 2012; Powell et al., 2016; DHET, 2019b). As such, the goals of education and training were split into a Ministry of Education and a Ministry of Labour (Allais, 2012). The former would be responsible for schools, adult education, colleges and universities, while the latter would oversee skills development (Allais, 2012).

Skill development was reformed again in 2009 in pursuit of a more responsive delivery system (Powell et al., 2016). The Ministry of Education, accordingly, was split into the Department of Basic Education (DBE), focusing on the schooling system, and the Department of Higher Education, focusing on the PSET system (DHET, 2019b). The DHET also subsumed certain functions that previously resided in the Ministry of Labour (DHET, 2019b). The reforms from this period, which were made to match skills demand with the provision of education and training, are aligned with the concept of skills development as assessed in this research study.[10]

4.1. The South African skills development framework

[10] As stated earlier, skills development in this research study refers to "all education and training which is aimed at the workplace" (Allais, 2012, p. 633).

The current policy context of SA's skills development system is guided by the Skills Development Act (SDA) of 1998, which aims to develop and enrich the skills of the South African workforce; to ensure quality education and training; and to ensure that opportunities are created for skills acquisition and workplace-based learning through the participation of employers, workplaces and employees (Government Gazette, 1998). The workplace becomes an active learning environment for employees to learn and train to achieve the skills that are demanded in the labour market. The ultimate aim is for skills development to produce a skilled and capable workforce that can contribute to the national developmental imperative to create employment and reduce inequality and poverty.

Key skills development legislation, policy and strategies are briefly described hereunder in the context of this research study.

4.1.1. Skills development legislation

This sub-section provides a brief overview of the skills development legislation in South Africa, namely:

- The Skills Development Act No. 97 of 1998
- The Skills Development Levies Act No. 9 of 1999

The SDA guides the national skills development system and is achieved through an institutional and funding framework that carries out this purpose (Government Gazette, 1998; DHET, 2017a). The framework consists of skills levy organisations: the NSA and the NSF. These organs play an essential role in planning, governing and administering skills development efforts. Another key organ in the framework is the SETAs. The 21 SETAs, as of 2011, are responsible for planning, managing and facilitating sector skills planning within the framework of the National Skills Development Strategy (NSDS) (Government Gazette, 1998; DHET, 2019a).

The Skills Development Levy (SDL) is a compulsory levy scheme, in accordance with the SDL Act, for encouraging learning and development (DHET, 2017a; SARS, 2020). A monthly levy

(of 1%) from employers' payroll is collected by the South African Revenue Services (SARS). This levy, as well as that from unallocated SDL contributions, is paid to the DHET (SARS, 2020). The DHET disburses 80% of the accumulated funds to the 21 SETAs, and 20% goes to the NSF for funding and supporting skills development objectives (DHET, 2017a). The SDL serves to develop the skills of employees and enables the institutional and funding framework of the NSF and the SETAs to fulfil this function (DHET, 2017a).

4.1.2. Skills development policies

This sub-section provides a brief overview of the skills development policies, namely:

- The White Paper for the Post School Education and Training (WP-PSET)
- The third National Skills Development Strategy (NSDS III)
- The revised Human Resource Development Strategy for South Africa (HRDSSA II)

In 2013, the DHET, whose responsibilities included the implementation of the Skills Development Act and providing oversight of qualifications and education and training authorities (SAQA and SETAs), published the White Paper for the Post School Education and Training (WP-PSET) to set out its priorities and strategies as informed by the National Development Plan (NDP) (DHET, 2019b). These strategies aspired to improve the overall PSET system to meet the country's training, education and employment needs, which is central to the achievement of "a skilled and capable workforce to support an inclusive growth path" or Outcome 5 of the government's 14 performance outcomes (DHET, 2013).

The NSDS was developed as the implementation framework for Outcome 5 and provides the strategic framework for skills development institutions (the DHET, SETAs and the NSF) to collectively implement the national objectives and developmental imperatives associated with skills development (DHET, 2015; DHET, 2017a). The NSDS III (2011–2020), compared to its predecessors, focused on improving the effectiveness and efficiency of the PSET system and responds to the skills development challenges that impact the economy and employment (DHET, 2015; DHET, 2017a). The first revision (2000–2005) focused on increasing the

productivity of employed workers; the second (2006–2010) focused on job creation through learning and artisan training programmes for the unemployed (DHET, 2017a). The NSDS III concluded on 31 March 2020 and made way for NSDP 2030, which launched on 1 April 2020 and is discussed in the concluding chapter of this research report.

The Human Resource Development Strategy for South Africa (HRDSSA II) prescribes eight commitments that must be reflected in the plans of the SETAs and the NSF (DHET, 2015). These commitments loosely translate to increasing the supply of people with priority skills; using skills development programmes as a vehicle to overcome poverty and unemployment; increasing access to education and training opportunities to obtain sustainable employment; and promoting technological and innovation capability within the public and private sector (DHET, 2015). The NSDS III is a sub-component of the HRDSSA and operates in conjunction with and in support of the strategy (DHET, 2015).

4.1.3. National developmental strategies

This sub-section provides a brief overview of some of the more recent national developmental strategies, namely:

- The National Growth Path (NGP)
- National Development Plan (NDP) 2030
- The Industrial Policy Action Plan (IPAP)

The NDP 2030 targets the country's severe inequality in areas such as income, employment, skills, education and other opportunities of access and ownership such as housing, land and assets (National Planning Commission, 2011). These areas are the deliverables for the country's social and economic development objectives as well as the strategic aims of the skills development institutional and funding framework.

The NGP was formulated to drive the country's economic policy jobs strategy and grow employment (DED, 2011). Its strategy calls on key role-players in the economy to make employment a central focus and be productive organs of the economy to enable inclusive and

sustainable growth (DED, 2011). The National Skills Accord, an outcome of the NGP, is committed to the expansion of workplace-based learning to increase employment and placement for unemployed individuals (DED, 2011).

The IPAP, which has been revised since 2014, is an active industrial policy to improve economic productivity at the national, sectoral and enterprise levels through enhancing the output of relevant skills and occupations in key economic sectors (dtic, 2018). The IPAP identifies the factors that contribute to SA's weak economy as a weak skills system, poor linkages between sectors and practices that limit innovation, amongst others (dtic, 2018). The IPAP identifies enormous potential for employment creation for unskilled and semi-skilled individuals in productive sectors (dtic, 2018).

4.1.4. Overarching strategic and budgetary framework

This sub-section briefly describes the budgetary framework towards developmental objectives, specifically skills development policies, namely:

- Medium-Term Strategic Framework (MTSF)
- 2020/21 Medium-Term Budget Policy Statement (MTBPS)

The MTSF is a five-year strategic plan for government and the implementation arm of the NDP 2030 (South African Government, 2014). It also lays out the interventions and programmes that will ensure that the outcomes of the NDP are achieved by 2030 (South African Government, 2014). The MTSF ensures policy coherence and coordination across government plans and that there is alignment with budgeting processes (South African Government, 2014). Furthermore, it is linked to the outcomes of the DHET and is structured around education and skills towards the attainment of a skilled and capable workforce (South African Government, 2014). The current MTSF (2019–2024), which replaced the first revision (2014–2019), aims to address SA's triple challenge under three pillars, namely:

- achieving a more capable state,
- driving a strong and inclusive economy, and
- building and strengthening the capabilities of South Africans (DPME, 2019).

The targets of the MTSF 2019–2024 include, amongst others, proposing a more realistic GDP growth rate of 2–3% by 2024; reducing unemployment to 20–24% by 2024; and lowering the national Gini coefficient to 0.66 from 0.68 by addressing income and asset inequality in the country (DPME, 2019).[11]

The MTBPS sets out the policy framework for the coming budget by examining the current economic environment as well as the total level of resources available to address government's priorities (National Treasury, 1997). Government's operational plan for dealing with the COVID-19 crisis, as per the MTBPS 2020 (delivered on 28 October 2020), indicates the following concerning education and training. The MTBPS's spending priorities are to stabilise debt while supporting economic recovery, which means that significant spending cuts will be made in the medium term (National Treasury, 2020). However, basic and post-school education and training will continue to receive a large allocation of funds under the learning and culture function (National Treasury, 2020). Basic education is expected to achieve an annual average growth (AAG) rate of 0.8% between 2020/21 and 2023/24, while post-school education training is expected to achieve an AAG of 1.7% over the same period (National Treasury, 2020). The MTBPS 2020 emphasises that targeted skills development will improve productivity and employment prospects, and therefore, job creation remains a top priority of the economic recovery plan (National Treasury, 2020).

Together, these institutions, policies, strategies and key role-players are expected to drive skills development in the country by increasing funding, access and participation in learning and education in line with the demands of the labour market and government priorities.

4.2. Persistent challenges that drive skills development in South Africa

This sub-section explores the conditions that led to South Africa's skills development framework. Context is provided through data on the unemployment statistics in the country prior

[11] The Gini coefficient is an index that measures income inequality in a nation. A coefficient of 0 presents perfect equality and 1 presents perfect inequality (Ramzai, 2020).

to the COVID-19 pandemic, as well as those of 2020. Where possible, projected employment statistics are also provided.

4.2.1. Challenges of a low-skilled workforce

As identified in the literature review, education has long been linked to the economic development of a country. Unskilled, semi-skilled and skilled labour support an economy to be active, developing and competitive. Economic growth through human capacity is sustained and can even achieve advanced levels of growth if labour is used productively.

The country's current approach to skills development aligns with the idea that elevated education and skills levels are enablers of economic growth, while unskilled labour is perceived to undermine economic growth (Kraak, et al., 2013; Groener, 2013; Allais & Nathan, 2014; Powell et al., 2016). Moreover, the attainment of skills also leads to increases in employed and employable people in a country. These individuals are considered as participants of the economy, offering either skilled labour or creating jobs through self-employment and entrepreneurial efforts. This is a structural exercise for economic growth—'skills' in contemporary policies are linked to international competitiveness and reductions in unemployment, poverty and inequality (McGrath, 2004; Kraak, et al., 2013; Groener, 2013).

However, in SA, the legacy of the pre-1994 regime produced a country with a mainly low-skilled workforce (Kraak, 2004a; Ashton, 2004; Groener, 2013). 'Low skills' are perceived as contributing to slow economic growth, high unemployment rates as well as perpetuating poverty and inequality (World Bank, 2017).[12] In contrast, a skilled workforce can transform an economy, making companies more competitive and adaptable to economic changes (World Bank, 2018). It also spurs innovation and allows workers to move beyond low-productivity activities and thereby increase their income potential (World Bank, 2018). Addressing the issue of 'low skills' through more active labour market policies is, therefore, a national priority. Following 1994, new qualifications were developed and registered on the NQF in SA in accordance with employer-

[12] This study is cognisant of the negative or racial connotations associated with the concept of 'low skills' in South Africa. Instead, the concept of 'low skills' is used in this study with reference to the SAQA qualifications framework, which defines 'low skills' as pre-matriculation learning only or NQF levels 1-3.

and stakeholder-specified competencies to enable this kind of economic transformation (Kraak, 2004a; Allais, 2012; Powell et al., 2016).

As such, the current skills development system developed in the early phases of the current regime focused on upskilling skills at all levels and across economic sectors to "free" the economy from its low-skills "trap" (Kraak, 2004a; Allais, 2012; Groener, 2013). Earlier research data reveals that there is indeed a push toward high-skills attainment in SA; the sectors with the highest training rates are those that are characterised by high and intermediate skills, such as the banking, insurance and financial services sector (Badroodien, 2004). Badroodien (2004) concludes, in his assessment of the NSDS institutional regime, that it has the potential to reverse low skills levels, particularly with a greater, growing network of the key role-players in the national skills system. Kraak (2004b) argues for a more sensible, alternative approach of pursuing "*higher* skills" in SA (or developing economies) as opposed to simply 'high skills' (prevalent in high-skills societies or advanced economies), which makes the current NSDS institutional regime appear ambitious.

According to the NQF, levels 1–3 are considered 'low skills' or pre-matriculation; levels 4–5 are intermediate skills, including artisans and technicians with matriculation or post-matriculation diploma qualifications; and levels 6–8 and upward are high skills levels or equivalent to higher education degrees and postgraduate qualifications (Horwitz, 2013; SAQA 2015; DHET, 2019c).[13]

The table below gives a breakdown of the South African workforce by skill level in 1994 compared to 2014.

Table 1: Employment composition by skill level, 1994 vs 2014

Skill level	1994	2014	Change (% points)
Skilled	21%	25%	+4 ↑
Semi-skilled	47%	46%	-1 ↓

[13] See Annexure A: National Qualifications Framework, sub-frameworks and qualification types.

Skill level	1994	2014	Change (% points)
Low-skilled	32%	29%	-3 ↓
TOTAL	**100%**	**100%**	**-**

(Source: Stats SA, 2014a; Stats SA, 2014b).

Table 1 shows that the demand for skilled labour grew between 1994 and 2014, while low-skilled labour showed a more significant decline than semi-skilled labour over the same period. In 2014, the second set of skills development reforms were implemented, with the DHET spearheading efforts to produce education and learning that is in line with labour market demands. In 2014 (15 million), there were over 6 million more people employed than in 1994 (8.9 million) (Stats SA, 2014b). This means that more people achieved higher education outcomes in recent years that enabled them to enter more skilled professions. While skilled labour showed growth, the number of people in low-skilled labour was reducing over time.

However, while this trend is a positive reflection of the country's developmental efforts to reduce poverty, inequality and unemployment, low skills signal social disadvantage which encompasses economic, social and political deprivation (Hasluck, 2011). Based on the findings of a UK-based study, the employment prospects during an economic downturn are worse for people with low-ranked skills or qualifications (Hasluck, 2011). Low-skilled people are in a weak competitive position; they are most likely to be trapped in worklessness and formal unemployment and have a higher rate of being economically inactive (Hasluck, 2011).

Low-skill labour is also often elementary and routine (Hasluck, 2011). The changing economic climate and work dynamics will require labour that is dynamic and adaptable (WEF, 2020; PwC, 2021; WEF, 2021). Workers will be required to adapt to demands which require that they can advance their skill set as the world advances and at a much faster pace than expected before 2020 (WEF, 2020; PwC, 2021; WEF, 2021). Even before 2020, Hasluck (2011) found that employers will increasingly demand higher levels of skills, even for traditionally low-skill employment, and that economic recessions displace most workers, increasing the competition for jobs. This means that while people with low skills have been reducing in the South African

labour market, the pandemic has effectively made those who *are* still low-skilled even more vulnerable than before.

4.2.2. Unemployment challenges

South Africa has a long history of growing unemployment. Despite having doubled the number of people employed from at least 8.9 million in 1994 to 16.5 million in 2018, and achieving an average GDP growth rate of 2.8%, the economy has found it difficult to generate *enough* jobs (South African Government, 2019). Significant statistics include the 36.4% unemployment rate in 1999 and the dip of 21.5% just before the 2008 financial crisis (South African Government, 2019). More notably, the South African Multidimensional Poverty Index (SAMPI) confirms that unemployment is the largest contributor to poverty in the country, with a weighting of 40% in 2011, according to reported data (South African Government).

The government's 25-year review notes that persistent unemployment, together with legacy structural impediments such as spatial planning, is influenced by rising demand for high-level skills and high entry-level requirements in the labour market (South African Government, 2019). The review also notes that population growth has surpassed economic growth, affecting the country's ability to create jobs for all (South African Government, 2019).

The graph below shows the annual average unemployment rate between 2010 and 2019 based on Quantec economic data for labour in South Africa. The data are derived from Stats SA QLFS statistics.[14] These data reflect the official definition of unemployment, which describes the number of people who are actively looking or are available for employment but were not in any form of employment at the time; it does not include discouraged work-seekers (Stats SA, 2020c).

[14] The QLFS, conducted by Stats SA on a quarterly basis, is a household-based sample survey that collects data on the labour market activities of the working-age population (15–64 years) (Stats SA, 2020c).

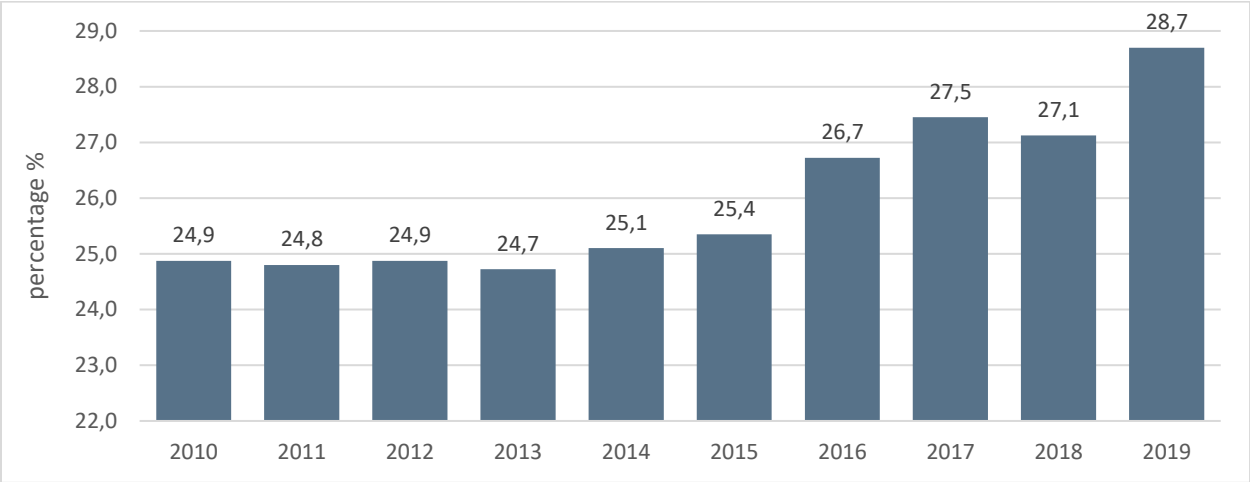


Figure 1: Annual average unemployment rate, 2010–2019 *(Stats SA, 2020b: P0211, derived from Quantec Economic Data).*

The unemployment trend of the past ten years shows a gradual increase in unemployment with significant increases seen between 2015 and 2019. The annual unemployment rate, prior to the COVID-19 pandemic, rose from just under 25% in 2010 to over 28% in 2019. The unemployment rate year-on-year change from 2018 to 2019 was 5.8%, the highest in the ten-year period examined. The annual unemployment rate in 2020 was 29.2% and is discussed further in section 5.1 (Stats SA, 2020b).

Demographic and employments trends in the country show that young people in the country are the most unemployed and economically vulnerable. There are at least 38.7 million people of working age (15–64 years old) in the country (Stats SA, 2020a). At least 20.4 million people of the working-age group are young people (15–34 years old), and they account for 63.3% of the total unemployed persons (7.1 million) in Q1:2020 (Stats SA, 2020a). Moreover, the graduate unemployment rate is lower than the rate of other levels of education, which means that persons with a tertiary level of education (or a high skills level) have better chances of being employed, as indicated in the previous section (Stats SA, 2020a).

The table below shows the annual average youth unemployment rates per the reported age groups (ages 15–24 and 25–34) compared to the total average unemployment rate (ages 15–64) for the 2010–2020 period.

Table 2: Unemployment rate for youth in relation to unemployment for total working-age group

Year	Average annual unemployment rate		
	Working age 15–64 (%)	Age 15–24 (%)	Age 25–34 (%)
2010	24,9	51,2	29,3
2011	24,8	50,3	29,9
2012	24,9	51,7	29,6
2013	24,7	51,4	29,1
2014	25,1	51,3	30,1
2015	25,4	50,1	30,2
2016	26,7	53,3	31,7
2017	27,5	53,4	33,1
2018	27,1	53,4	33,4
2019	28,7	57,0	35,4
2020	29,2	59,0	36,3

(Stats SA, 2020b: P0211, derived from Quantec Economic Data).

Table 2 shows that the unemployment rates for age groups 15–24 and 25–34 exceed the total unemployment rate in every instance. The unemployment rate for the 15–24 age group is significantly higher, which indicates that this group faces "extreme difficulties" in engaging with the labour market in South Africa (Stats SA, 2020a). According to Stats SA (2020a),

> "Young work-seekers are not well-educated and do not possess sufficient skills and previous work experience demanded by employers in the labour market."

What does this mean for young people in an economy that is facing rapid change? Employers in the labour market will demand skills and experience that align with emerging business needs that did not exist before 2020. While the statistics show that newly qualified graduates have a fighting chance, those with 'low skills' will slip further down the ranks, growing more 'discouraged' as the economy evolves.

This sub-section showed that SA faces continued high unemployment rates along with a legacy low-skilled workforce. These challenges are inherent to skills development policy that aims to resolve structural unemployment, poverty and inequality, which is an important public need.[15]

[15] Structural unemployment refers to the overall inability of an economy to provide employment for the total labour force even at the peak of its economic cycle (Cloete, 2015).

Building upon this context, the following chapter presents the key findings concerning the study's main objective, which is to assess the economic impact of the pandemic on South Africa's jobs, skills needs as a result of the unfolding world of work, and skills development landscape. This assessment gives insight into the credibility/capability and sustainability of the current skills development system based on the framework outlined in this chapter.

5. Findings, Data Analysis and Interpretation

Through the identification, assessment, interpretation and analysis of available research, this chapter presents the impact of the COVID-19 crisis on South Africa's skills situation. The aim is to answer the research questions of this study and build towards a projected future outlook for skills development based on current events.

5.1. Economic impact of the COVID-19 pandemic

This section gives insight into the country-level experience of South Africa under the economic shock of the pandemic on the economy, jobs and labour.[16]

5.1.1. Impact on the economy

The onset of the pandemic was initially met with panic—the crisis threatened to destroy key economic sectors, resulting in massive job losses. The prospects for the already- and newly unemployed appeared daunting, and pundits foreshadowed that the economy would not recover to re-absorb lost labour. There was also fear that hard lockdown restrictions would persist indefinitely and that the health implications of the virus could never be contained. For the already-volatile South African society, this meant that people feared increasing poverty, inescapable inequality and insurmountable unemployment, as well as looming illness and death.

Nearly 12 months later, it is safe to assume that, at the worst, some economic sectors will never fully recover and others will likely undergo transformation. However, economic recovery is achievable, and employment can be restored in due time. The data presented in this section provide insight into the impact of the pandemic on the national GDP.

[16] "Economic shocks can be defined as a relatively sudden change and unpredictable changes in the economy that can affect all aspects of the economic system including labour market, specific sectors of the economy and occupational groups and can lead to positive and negative changes in the labour market" (Kramer & Kramer, 2020).

At the end of Q2:2020, the pandemic and associated lockdown had resulted in decreased household and business income alongside spikes in unemployment, business closures and halts in imports/exports and travel—by June, only 14.1 million people were employed, compared to the 16.3 million people employed in Q2:2019 (National Treasury, 2020; Stats SA, 2020c). The national GDP rate had also plummeted to a record low in Q2:2020 (National Treasury, 2020).

Table 3 shows the quarter-to-quarter changes in GDP growth in 2020. The rates are seasonally adjusted and annualised to determine an annual rate based on short-term calculations.

Table 3: SA Quarterly GDP growth rate (constant 2010 prices), 2020

	Q1:2020 (Jan-Mar)	Q2:2020 (Apr-Jun)	Q3:2020 (Jul-Sep)	Q4:2020 (Oct-Dec)
Quarter-on-quarter GDP rate (seasonally adjusted and annualised)	-1,4%	-51,7%	66,1%	6.3%
Quarter-on-quarter GDP rate (seasonally adjusted, non-annualised)	-0,4%	-16,6%	13,5%	1.5%

(Source: Stats SA, 2020f: P0441; Stats SA, 2021c: Fact sheet D – Quarterly estimates).

As shown, the economy rebounded in Q3:2020. Increases in exports and household spending were supported by the easing of lockdown restrictions following the hard lockdown of the previous quarter, when the economy experienced a significant slump (Stats SA, 2020f). Despite this surge, the economy in Q3:2020 was still 5,8% smaller than it was in the same quarter in 2019 (Stats SA, 2020g). The GDP rate was 6.3% in Q4:2020 compared to -1.4% in Q4:2019 (Stats SA, 2021c). While this comparison shows a positive outlook on quarter-to-quarter changes, the annual GDP rate, as illustrated in the graph below, shows that the economy had not recovered to pre-crisis levels on an annual basis by the end of Q4:2020.

Figure 2 contrasts the annual GDP growth rates between the last financial crisis of 2008/9 and the COVID-19 global crisis of 2020/21.

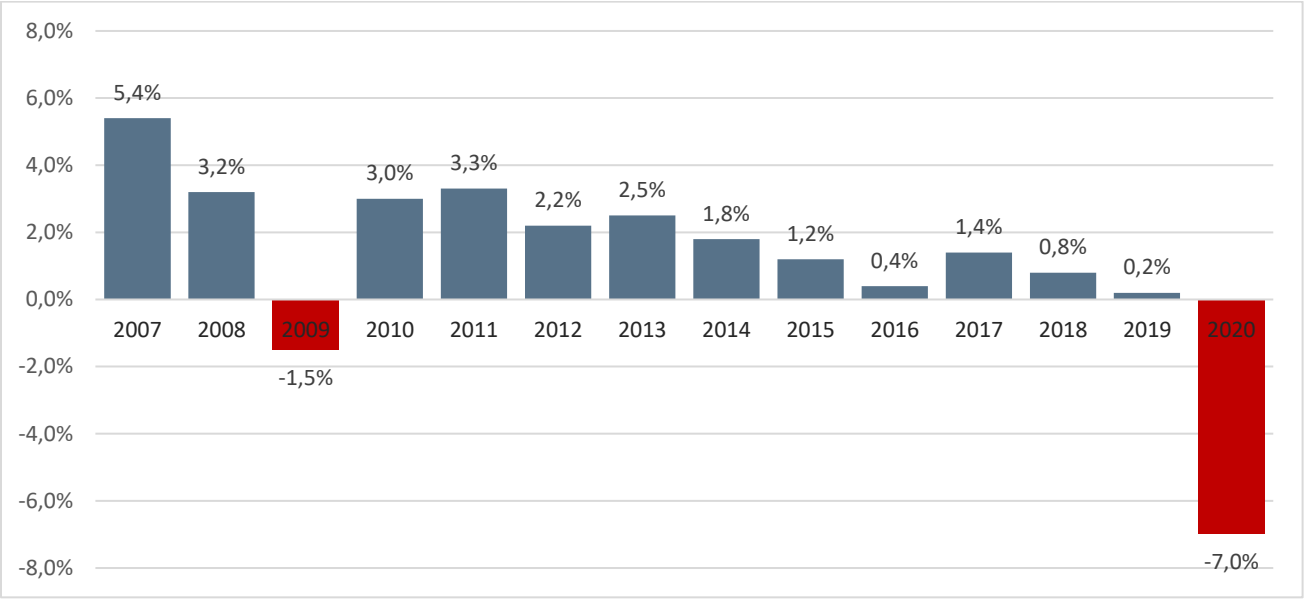


Figure 2: SA Annual GDP growth rate (constant 2010 prices), 2007–2020 *(Stats SA, 2020f; Stats SA, 2021c).*

In mid-2020, the South African Reserve Bank (SARB) forecast the annual GDP to contract by 7.8%; at the end of the year, this forecast changed to -8.0% (SARB 2020a; SARB 2020b; SARB 2021). Figure 2 shows that the economy recorded the lowest annual GDP growth in 2019 (0.2%) and 2020 (-7.0%) since 2009 (-1.5%). The graph illustrates economic recovery following the 2008/9 recession and global financial crisis, yet the economy contracted again in 2014 and failed to recover to earlier levels running up to 2019.

In 2020, with the onset of the COVID-19 pandemic, the economy experienced a significant slump with 7% negative growth—the biggest annual fall in economic activity since 1946 for South Africa (Stats SA, 2021b). The second biggest fall was in 1992 with -2.1% (Stats SA, 2021b). This means that at the end of 2020, in terms of GDP per capita, the country is in a worse position for its well-being. GDP per capita peaked in 2014 and has been declining since—SA's economic growth is struggling to keep up with population growth (Stats SA, 2021b). GDP per capita at the end of 2020 is practically at the same level seen in 2005 (Stats SA, 2021b).

The continued weak economy, negative economic growth, coupled with rising government debt (above 80% of GDP) and a growing budget deficit (15.7% of GDP), impacts sectoral performance, socio-economic growth and employment (National Treasury, 2020). The

resilience and effectiveness of economic reforms and policy are also tested under such weak economic conditions. Developmental targets and objectives, such as increasing employment and raising skills levels, become difficult to achieve or are not achieved at all.

However, the economy is expected to grow by 3.6% in 2021, by 2.4% in 2022 and 2.5% in 2023, resembling the growth rates following the 2008/9 crisis, as seen in the graph (SARB 2021). This is a favourable indication as positive economic growth can create an environment conducive to a higher rate of labour absorption, job creation and increased human capital development through advanced education and industrialisation strategies. South Africa's challenge will be to sustain the recovery rates to realise such prospects over the long run.

5.1.2. Impact on jobs and unemployment

Further to the data shown in section 4.2.2., Table 4 shows that the pandemic and earlier lockdown (particularly under levels 5 to 3 from March to August) measures exacerbated the country's unemployment challenges.

Table 4: Quarter-to-quarter changes in employment, 2020

	Q1:2020 (Jan-Mar)	Q2:2020 (Apr-Jun)	Q3:2020 (Jul-Sep)	Q4:2020 (Oct-Dec)
Quarter-to-quarter unemployment rate (%)	30,1	23,3	30,8	32,5
Quarter-to-quarter changes (%)	9,1	-19,7	5,8	1,7

(Source: Stats SA, 2020b: P0211; Stats SA, 2021a).

The unemployment trends of 2020 reflect the impact on jobs and employments with the sudden onset of the economic crisis of the pandemic. The restrictions on movement, due to the health and safety regulations imposed as a result of the virus, prohibited the activity of many economic sectors and severely impacted labour. This is seen in the drop in the unemployment rate in Q2 as fewer people actively sought employment. When lockdown restrictions eased under level 3, people resumed their activity in the job market, and the addition of new job losses created a surge in the unemployment rate as seen in Q3. In Q4, and under level 1, the economy resumed near-normal activity. The unemployment rate, subsequently, reflects an increase in

unemployment compared with pre-COVID times (or Q1) and is indicative of the large number of jobs shed between Q2 and Q4.

Between Q1 and Q2, 13.6% fewer people were employed, with 2.2 million jobs shed due to the impact of the pandemic (Stats SA, 2020d). As such, the number of employed persons decreased by 2.2 million to 14.1 million in Q2—the largest Q-to-Q change recorded in the survey—while over 5 million people became 'not economically active' (NEA) between Q1 and Q2 (Stats SA, 2020d). Moreover, the reduced unemployment rate in Q2 (23.3%), as shown in the table, is due to the reduction in labour force participation as a result of the nationwide COVID-19 lockdown restrictions. This means that together with the job losses, more people were also not actively looking for jobs (Stats SA, 2020d). In Q3, unemployment increased by 2.2 million to 6.5 million people (a 52.1% increase), while the number of employed persons increased by 543 000 (3.8%) to 14.7 million (Stats SA, 2020e).

In Q4:2020, unemployment increased to 7.2 million, with 701 000 more persons unemployed (Stats SA, 2021a). Moreover, 17.1 million were now considered NEA, with 2.9 million people (an 8.7% increase) being discouraged work-seekers (Stats SA, 2021a). Unemployment, which was at 32.5% for Q4:2020, was unprecedented since the QLFS in 2008 (Stats SA, 2021a).

The expanded definition of unemployment, which includes the number of people who are discouraged work-seekers, i.e. those who have stopped actively looking for employment, shows a more significant proportion of South Africans who are unemployed and economically inactive (Stats SA, 2020c; IRR, 2020). Under the expanded definition, in 2020, roughly 10.2 million (42%) people were unemployed in Q2, with an increase to 43.1% in Q3—and in Q4, with a slight decrease to 42.6%, 11.1 million people were unemployed (Stats SA, 2020c; Stats SA, 2020d; Stats SA, 2020e; IRR 2020; Stats SA, 2021a).

The expanded definition is considered to provide a more accurate picture of unemployment in the country since it includes the number of people who are available to work but are not active in the job market (IRR, 2020). In the Q2:2020 survey, persons indicated as 'discouraged work-seekers' cited that they stopped looking for work because of 'the national lockdown/ COVID-19 /coronavirus' as their main reason for 'discouragement' (Stats SA, 2020d). This speaks not only

to the rife impact of the pandemic and lockdown measures on people's ability to work and find work, but also to the concurrent influence on people's motivation to be active in the labour market. Moreover, persistent unemployment threatens the relevancy of skills and qualifications of the active labour market, which means that for many, what they had obtained before 2020 could become redundant in just under five years.

5.1.2.1. Impact on youth unemployment

In section 4.2.2., the youth were identified as those most affected by high unemployment rates. The graph below depicts the quarter-to-quarter changes in youth unemployment in 2020.

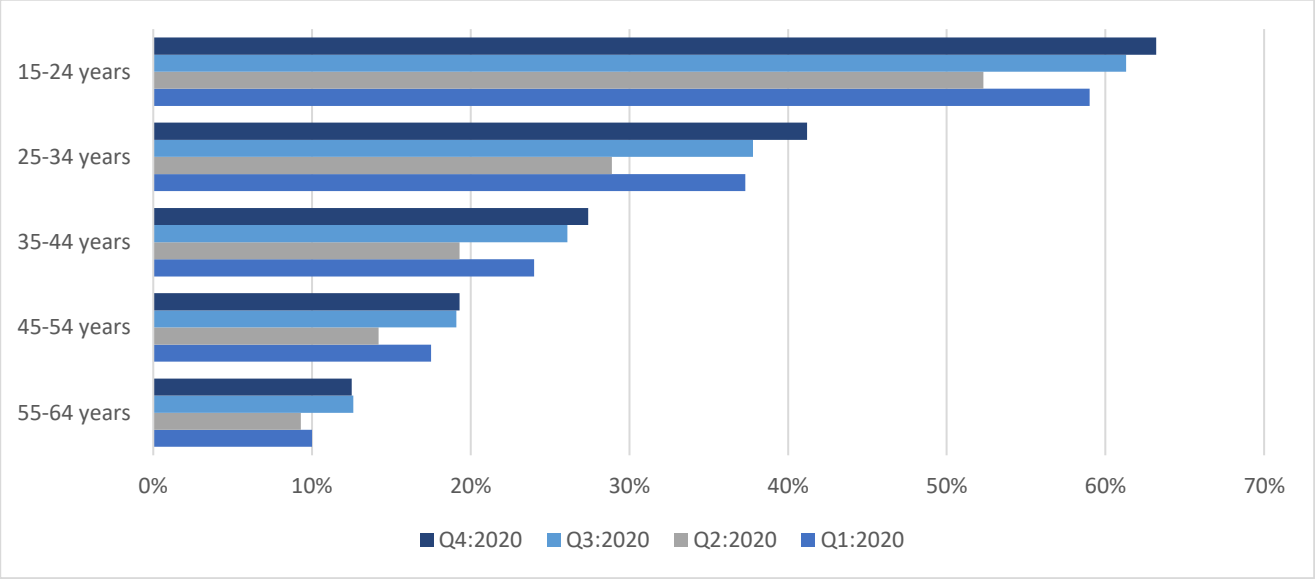


Figure 3: Unemployment by age group quarter-to-quarter, 2020 *(Stats SA, 2021a).*

Figure 3 illustrates the unemployment rate per quarter for each age group. It is evident that young people who fall within the national youth category (ages 15–34) are the most vulnerable compared to the older age groups, and they consistently experience the highest rates of unemployment in a given year. In Q4:2020, unemployment in the 15–24 age group exceeded 63% and reached 41.2% in the 25–34 age group, compared to 12.5% in the pre-retirement age group (55–64) (Stats SA, 2021a).

Under the expanded definition, the unemployment rate amongst those aged between 15–24 years was 73.8% in Q4:2020, and 50.7% amongst those aged 25–34 years (Stats SA, 2021a). Moreover, the absorption rate in the younger group is 7.8%, and 41.8% in the group aged 25–34 years, which means the extreme difficulties this group faces will not ease as the economy is expected to have a slow recovery rate (Stats SA, 2021a). The industries that absorb labour will also have changing demands during this time while the unemployed are struggling to find employment in order to gain experience and develop their skills.

An even bigger concern is the significant number of young people who are not in employment, education or training (NEET), which will only exacerbate the difficulties they face engaging with the labour market. Approximately 3.1 million (29.8%) youth of 15–24 years are considered NEET (Stats SA, 2021a). The NEET rate, when including the youth of 15 to 34 years, is 41.8% (Stats SA, 2021a).

5.1.3. Impact on labour and the world of work

This section discusses the impact of pandemic-related shocks on labour and changes to the world of work, drawing on global and domestic insights.

An ILO-OECD (the International Labour Organisation and the Organisation for Economic Cooperation and Development) study on the impact of the COVID-19 pandemic on jobs and incomes in G20 economies, which include South Africa, had the following key findings:[17]

- Up to 60% decline of industrial production in many countries;
- A sharp and unprecedented fall in employment, including lay-offs, furloughs and reduced work hours, ranging from 8–9% in advanced economies to 40% in emerging economies;
- Informal workers (850 million (70%) out of 1.2 billion informal workers across the G20 countries) severely impacted because they are unable to work from home (WFH), are in

[17] The members of the G20 are Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Republic of Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, the United Kingdom, the United States and the European Union (DFAT, 2021).

high-risk sectors of the economy; many are own-account and small business, and thus experience a lack of social protection;

- A substantial shift to WFH was seen for all G20 countries (ILO-OECD, 2020).

Furthermore, despite the efforts of governments globally to protect jobs through relief schemes, many people still lost their jobs (ILO-OECD, 2020). The pandemic and its impact on the labour market also exposed vulnerabilities and entrenched inequalities in the system; lower-skilled individuals and women were most impacted by job and income losses (ILO-OECD, 2020; Jain et al., 2020a; Kramer & Kramer, 2020). Younger people were impacted by school closures and halts on entry-level jobs, including internships and apprenticeships, most of which require on-the-job training that cannot be undertaken off-site or virtually (ILO-OECD, 2020). In the aftermath of the COVID-19 economic crisis, young people will succumb to even more precarious types of jobs as they fail to connect with the traditional labour market (ILO-OECD, 2020).

The impact of the pandemic on South Africa mirrors the global situation. The initial impact on business is observed through a Stats SA Business Impact Survey published in May 2020 (referenced in the literature review in section 2.1). The initial findings were that out of 2 182 tax-paying businesses, nearly 90% had smaller turnovers under lockdown level 5, with 37% expecting to lay off staff in the short term (Pillay et al., 2020). Over 45% of those interviewed expected a workforce reduction beyond level 5 (Pillay et al., 2020). By the end of Q2:2020, over 2 million jobs had been lost (Stats SA, 2020d).

In addition, the impact of the pandemic on SA business resulted in changes in labour and the way of work for those who were still employed (14.2 million in Q2:2020) (Stats SA, 2020d). More than half of the labour force (58% or 8 million individuals) were expected to work during the national lockdown by their places of employments, including continuing off-site work operations (Stats SA, 2020d). Professionals (44.7%) and managers (40.6%) were more likely than other occupations to work from home, indicating “access to tools of trade” as facilitating their ability to do so (Stats SA, 2020d). Lower-level occupational groups were less able to work from home (Stats SA, 2020d).

In terms of impact on income, 81.3% of all employed persons indicated that they continued to receive a salary; 21.1% of these persons received a reduced salary (Stats SA, 2020d). Persons above 35 years of age were more likely to receive a salary (82.1%) than younger working persons (79.8%), who also experienced more instances of not receiving a salary (Stats SA, 2020d). As the literature indicates, lower-skilled persons were mostly impacted by pandemic-related shocks. As shown in the graph below, those with lower levels of education were more likely to experience a reduced salary as a result of the pandemic (Stats SA, 2020d).

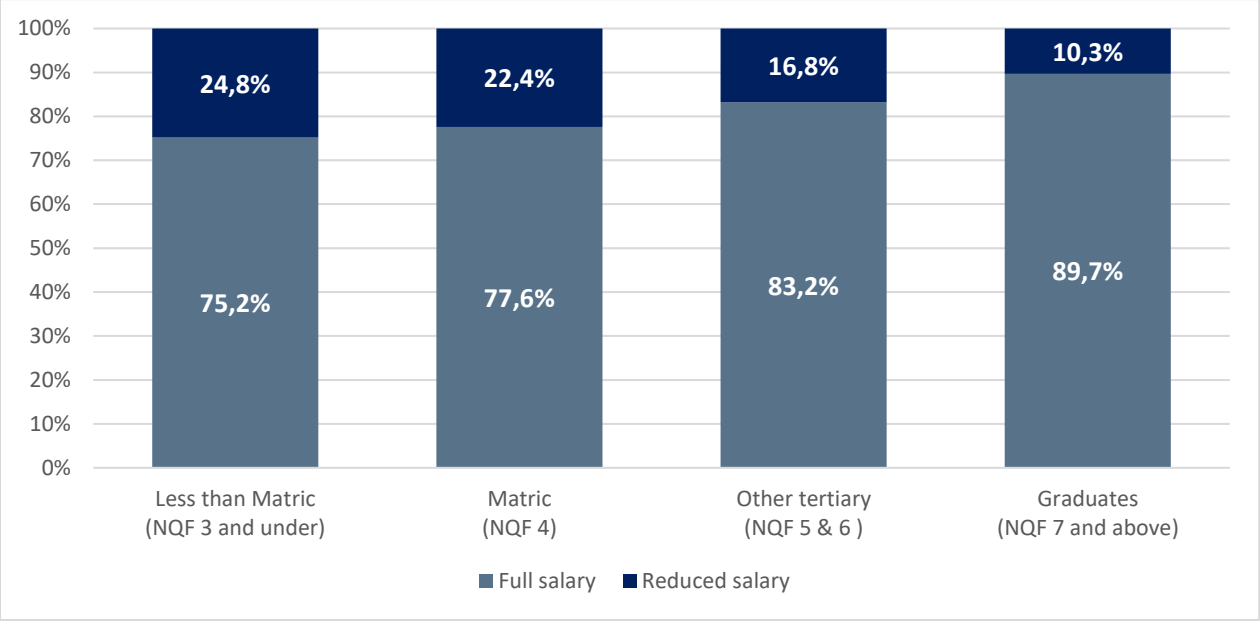


Figure 4: The relationship between the level of education and income during lockdown for working persons *(Stats SA, 2020d).*

These trends are confirmed in the NIDS-CRAM survey.[18] The findings here indicate that during the stringent lockdown period (level 5), a "dramatic change in labour market structure" was observed, with women, those with lower levels of education, manual workers, informal workers and the poor being the most impacted (Jain et al., 2020a, p.1). The initial evidence indicates that there was a significant reduction in active employment amongst women (49%) between

[18] NIDS-CRAM is the National Income Dynamics Study: Coronavirus Rapid Mobile Survey, which is a panel survey that investigated two key empirical questions: (1) What are the labour market effects of COVID-19 in South Africa and (2) How has this labour market shock affected individual welfare? The survey is stated to be "estimates" and "not representative of the SA population in 2020" (Jain et al., 2020a, p.3). As such, this study only makes use of the impact on the labour market pertaining who was affected and to what extent (social dynamics). (Un)employment, jobs and economic data in this study relies on Stats SA official publications or data derived from Quantec Economic Data.

February and April, and around 50% amongst manual workers and lower-income workers in the same period (Jain et al., 2020a). The survey's data show that women are most likely to appear in each instance of the pandemic-related labour market shocks than men (Jain et al., 2020a). The same cohort also experienced a higher reduction in full-time employment and earnings (Jain et al., 2020a).

In an updated survey, between April and June, findings showed that there was a relative shift into non-employment for many, while others remained in precarious work statuses such as part-time work, temporary lay-offs and paid leave (Jain et al., 2020b). However, in this set of data, women showed a higher recovery rate in active employment than men (Jain et al., 2020b). The evidence from both these surveys indicates that the initial impact of COVID-19 on the SA labour market has long-lasting ramifications which are "inequality-enhancing" (Ranchhod & Daniels, 2020). The restrictions on mobility and business activity due to the pandemic will bear indirect consequences that will shape the economy for many years to come (Ranchhod & Daniels, 2020).

Developing or emerging market economies tend to have fewer resources to support businesses and workers through a crisis; these countries also have a greater share of workers in occupations where they are unable to work under social distancing or from home (Jain et al., 2020a). The decline in employment in SA between April and June, which was a result of "severed employment relationships", will have long-term implications for the labour market as well as rising poverty and inequality (Jain et al., 2020a, p.8). The COVID-19 labour market shocks will be particularly detrimental for the vulnerable groups described here. The continuation of WFH in many industries, the shift to more autonomous and virtual work, and the way goods and services are produced will also negatively impact lower-income and lower-skilled people in the long run.

The sectors with close human-to-human contact were mostly impacted by health and safety measures such as social distancing (Strauss et al., 2020). Consumption-driven sectors, such as the service and agriculture sectors, were hit hardest by the onset of the pandemic (Strauss et al., 2020). These sectors include wholesale and retail trade with over 409 400 jobs shed, community, social and personal services, business activities, agriculture, construction,

professional business services (124 471 jobs shed), transport and storage, and catering and accommodation—these sectors account for 80% of all jobs at risk (Strauss et al., 2020, p.13). The pandemic has brought novel changes to labour, too. The British Broadcasting Company (BBC) (2020) asked experts, leaders and professionals about the 'unknowns' of work-life following the pandemic, and many agreed that the sudden shift triggered by the crisis will reimagine everything we know.

> "Work will never be the same, even if we don't yet know all the ways in which it will be different," says Slack CEO Stewart Butterfield (BBC, 2020).

The pandemic-related measures instituted globally have equalised the use of technology in many workplaces across occupational levels, as workers have had to become accustomed to technological tools as remote work quickly became the new norm. A hybrid remote-office model seems to be the future approach of international firms, with over 70% of workers (out of a sample of over 4 700 knowledge workers) in a Slack global survey indicating this model as the preferred way of work (BBC, 2020). While this model will benefit remote workers' efficiencies by incorporating limited social interactions for creativity and innovation, it will threaten the employment and livelihood of service workers who service these workers and offices (BBC, 2020; WEF, 2021). Service jobs in the transportation, food service, cleaning and maintenance, retail and personal care industries are facing the risk of their jobs disappearing in urban areas indefinitely as a result of the impact of COVID-19 on the world of work (BBC, 2020; WEF, 2021). These changes, their challenges and the skills needed to thrive under them are discussed in the next section.

These universal changes in labour and work indicate that over time, in SA, the labour market will have to adjust to changing, yet persistent, demands through mechanisms other than salary cuts and short time (furloughs). Such changes could be in the form of rapid or gradual adoption of automation and digital practices to accommodate health and safety requirements in the workplace without incurring profit losses. As such, the pandemic has presented the need for South Africa to address, alongside unemployment, "the nature of job changes" to:

> "…focus on which kind of jobs will be lost, who will be most affected, and where opportunities exist to create new employment" (Francis & Valodia, 2020).

SA's trend toward capital intensive production is also likely to be accelerated by pandemic-related measures such as social distancing, which will make automation increasingly attractive to firms (Francis & Valodia, 2020).[19] The shift to a more capital-intensive economy means that the emerging technologies of the 4IR will become more relevant to economies like SA, which will negatively impact labour and employment much sooner than anticipated for many industries, not only services and consumption-driven sectors.

5.2. Impact of the COVID-19 pandemic on skills and skills development

In this section, the impact of the pandemic is contextualised against emergent skills needs and the specific skills needs of the South African economy, paying attention to the needs prior to COVID-19 and also as a result of the pandemic. The section closes by assessing the skills alignment challenges South Africa faces in terms of labour market supply and demand.

5.2.1. Emerging trends

The onset of the pandemic in 2020 fundamentally shifted how people work. The pandemic presented a different way of doing work, effectively modernising how people work, unfolding overnight and requiring new sets of skills. As workforces migrated online, workers underwent a crash course in modern technology and had to adopt behavioural changes to supplement their adaptation (BBC, 2020; WEF, 2020). The pandemic accelerated the digital transformation of the 4IR, the changes to the world of work that were inevitable in the 4IR, and also the need for policy change in many areas of the economy and society.

> "The pandemic's most enduring impact will be as an accelerant. While it will initiate some changes and alter the direction of some trends, the pandemic's primary effect has been

[19] Capital-intensive production is the unbalanced proportion of labour versus capital (input versus output) in an economy. It can influence job-creation prospects (Francis & Valodia, 2020).

> to accelerate dynamics already present in society," states New York University Professor Scott Galloway (BBC, 2020).

For example, the importance of good bandwidth connectivity during the pandemic highlighted social inequalities that were already existent, as well as those generated by the evolving, increasingly digital and virtual order (BBC, 2020). Those with internet access are able to sustain their livelihoods and work remotely, while those without continue to struggle and remain out of work. Definite policy considerations arise here. Other lasting changes brought on by COVID-19, such as remote work and perceptions around work, will have profound implications for policymakers, companies and employees (Kramer & Kramer, 2020; WEF, 2020; PwC, 2021).

The pandemic-related changes to work will also be apparent in the status of certain occupations and their value; changes will be seen in the "temporal disappearance" of some occupations and the growth of other occupations (Kramer & Kramer, 2020). There are macro and micro forces at play in the institutional and social perceptions around occupations—for example, healthcare workers may see a rise in their status as a result of the COVID-19 pandemic (Kramer & Kramer, 2020). The labour market may also experience shifts in the supply and demand of some occupations due to the changing perception of such occupations (Kramer & Kramer, 2020; WEF, 2020; PwC, 2021).

Another inequality-perpetuating shift will be seen in employers increasing their investment in high-skilled occupations, while low-skilled occupations are likely to see a decrease in such investment (Kramer & Kramer, 2020). Low-skilled workers' productivity is dependent on work environments whose future survival is threatened, while high-skilled workers are perceived to be able to maintain productivity in extreme working conditions (Kramer & Kramer, 2020; Strauss et al., 2020). These perceptions will further perpetuate the idea of 'good' or 'decent' jobs in the future. Therefore, the economic impact of the pandemic will exacerbate existing inequalities related to gender and racial dynamics with divisions at the occupational level (Kramer & Kramer, 2020; Strauss et al., 2020).

The key trends impacting work and skills that emerged as a result of the COVID-19 pandemic and related restrictions, according to a McKinsey study on the future of work (2021), include the following.

- Jobs with high physical proximity are likely to be most disrupted.
- Remote work and virtual meetings are likely to continue.
- The extensive use of videoconferencing during the pandemic normalised the acceptance of virtual meetings.
- Virtual work will change the geography of work.
- Labour demand will be curtailed for frontline and customer-facing jobs due to remote work and the automation of some occupations.
- E-commerce and other virtual transactions will boom as consumers found them convenient during the pandemic.[20]
- The adoption of automation and artificial intelligence (AI) will be faster.[21]
- A different mix of occupations may emerge after the pandemic, particularly in advanced economies.
- The demand for workers in healthcare and science, technology, engineering and mathematics (STEM) occupations will grow.
- About 25% of workers in advanced economies will need to find a different occupation by 2030.
- Social and emotional skills and technological skills will increase, while basic cognitive skills and physical and manual skills will decline.

The scale of workforce transitions as a result of the pandemic requires urgency for businesses and policymakers to take steps to address changing labour trends (McKinsey, 2021; WEF, 2020; NPC, 2020; PwC, 2021). Additional training and education programmes for workers, as well as re-tooling the workforce with skills that make them flexible and adaptable, and to support

[20] Virtual transactions include telemedicine (online doctor consultations), online banking and streaming entertainment (McKinsey, 2021).

[21] Companies typically deploy automation and AI in warehouses, grocery stores, call centres and manufacturing plants to reduce workplace density and cope with surges in demand; this will become more common as a result of COVID-19-related safety measures (McKinsey, 2021).

workers migrating between occupations, are some of the measures businesses and policymakers can pursue (McKinsey, 2021; WEF, 2020; NPC, 2020; PwC, 2021).

In addition, research on the pandemic and its effect on work reveals that many work and career variables will be affected (Spurk & Straub, 2020). These include effects on working conditions, work motivations and behaviour, job and career attitudes, career development and personal health and well-being (Spurk & Straub, 2020). All the trends highlighted indicate that such variables will be affected at both the organisational and the individual levels (Kramer & Kramer, 2020).

In SA specifically, company closures, restructuring and downsizing will reflect in the labour market (Rasool, 2020a). The labour market will become more competitive; occupations that were previously in short supply may become surplus; and labour demand for some occupations and skills gaps may also change (Rasool, 2020a). Companies will continue to critically assess their internal value chain, cutting costs where necessary, and they will experiment with new organisational architectures (Rasool, 2020a). These include remote work, more frequent application of virtual tools to handle business and meetings, and flexible employment arrangements, e.g. a leaner core team supported by outsourced contractors (Rasool, 2020a).

5.2.2. Skills needs of the country

According to Reddy et al. (2016), determining skills demand involves three interrelated aspects: “the state of the economy; the characteristics of the employed and unemployed who make up the labour force; and current and intermediate demand from the analysis of changes in the structure of employment”. These signals of demand are compared with the supply of skills from the education system, the PSET system and the workplace (Reddy et al., 2016). This contrast is the basis for interpreting the “nature and extent” of the skills shortages facing the country (Reddy et al., 2016). The same contrast informs future skills development investment and interventions in line with the guiding skills development framework (Reddy et al., 2016).

Based on the above interpretation, the common trends in SA’s skills supply and demand are as follows. The continued low economic growth leads to poor employment growth, which also

means that the labour market cannot sufficiently absorb new entrants (Reddy et al., 2016; DHET, 2019c). As indicated in section 4.2, a structural mismatch between labour demand and supply exists where high-skilled labour is favoured even though SA's labour force is mostly characterised by low-level skills (Reddy et al., 2016; DHET 2019c). SA's education level and skill base are lower than those of many other productive economies, with occupational shortages concentrated in low-skilled occupations (Reddy, et al., 2016; DHET, 2019c). Most skills shortages, in terms of occupational levels, are in the group of 'professionals' in most sectors (DHET, 2019c).

The country witnessed a structural shift towards a service economy prior to COVID-19, with a high dependence on high-skilled financial services (Reddy, et al., 2016). Although the services sector contributes to the GDP growth of the country, it offers "negligible opportunities" for employment growth (Reddy et al., 2016).

Poor access to education and a lack of improvement in the quality of education in SA persist, putting constraints on labour market dynamics (Reddy, et al., 2016). The school system continues to see low completion rates and a poor throughput of STEM-inclined learners (Reddy et al., 2016; DHET, 2019c). The pool of learners who can access technical and science-based programmes is small in comparison to demand in the labour market (Reddy et al., 2016; DHET, 2019c). While an average of 148 500 bachelor's passes was achieved between 2010 and 2017, the average number of learners who passed mathematics with a score greater than 50% was only 52 600 in the same period (DHET, 2019c). Only these 52 600 learners can access STEM and health-related tertiary courses (DHET, 2019c).

Completion rates at public Higher Education Institutions (HEIs) are less than desirable, too (Reddy, et al., 2016). While enrolment rates were above 250 000 between 2010 and 2016, only 203 076 learners met requirements in the fulfilment of a degree or diploma in 2016 (DHET, 2019c). In line with the Classification of Educational Subject Matter (CESM), 27.8% of completions were in business, economics and management studies, 29.1% were in science, technology and engineering (which includes health-related professions), and 43.1% were in the humanities (DHET, 2019c).

As stated by Reddy, et al. (2016, p.9), these trends in SA's skills supply and demand signify that a policy response is required for "the imbalances that occur between the types of skills developed and those needed in the world of work". With shifts in global trends such as technological innovation through the 4IR, demographic changes and changes in business conduct, along with the trends generated by the coronavirus crisis, continuous changes will also be seen in the types of skills demanded in the South African labour market (DHET, 2019c).

Understanding the dynamics in skills supply and demand through policy and skills planning authorities has always been critical for SA in minimising skills shortages, surpluses and skills mismatches (Allais & Nathan, 2014; Reddy, et al., 2016; DHET, 2019c). This information will be even more critical following the pandemic for government to develop and implement the appropriate education and skills development policies and strategies to respond to the rapid changes in labour market dynamics.

The following sub-sections provide insight into the prominent skills needs identified in the country before the pandemic and for 2021/22, which are reflective of assessments based on the onset of the crisis.

5.2.2.1. Skills needs prior to the crisis

As indicated in the literature review, in SA's skills planning approach, the DHET has, since 2014, collated and published the OIHD list every two years for public consumption (DHET 2014a; 2018). The list, which identifies occupations in high demand for the review period, informs human resource planning and development toward addressing skills shortages and priority occupation shortages in the country (DHET, 2018; Reddy et al., 2018b). The OIHD also describes the occupations that show relatively strong employment growth and/or are experiencing shortages in the labour market or will see demand for them in the future (DHET, 2019c).

The occupations listed can exceed well over 350 entries. The list is categorised into occupations that received the highest points in the statistical index and are grouped into three

levels of demand: highest demand, higher demand and high demand (DHET, 2018; DHET, 2019c).

Government also publishes the Critical Skills List and the National Scarce Skills List; these lists are much shorter (up to 100 entries) compared to the longer OIHD lists, but they inform the same supply-side decision-making objectives (DHA, 2021; DHET, 2014b). Various organisations and media outlets use these lists to disseminate information on skills shortages in the country. According to one such summary (Kwach, 2019), the occupations in demand, or considered as 'scarce', based on 2018/19 data, were the following.

Table 5: Occupational shortages in 2018/19

Scarce skills fields	Examples of occupations/professions in demand
1. Agriculture and Agricultural Operations and Related Sciences	• Agricultural engineers • Forestry technicians • Agricultural scientists • Sheep shearers
2. Architecture and Built Environment	• Urban and regional planners • Quantity surveyors • Land surveyors • Construction project managers • Architects
3. Business, Economics Actuaries and Risk Studies	• Financial investment advisors • External auditors • Corporate general managers • Actuaries and management assessors
4. Information CISCO Solution Specialist Technology	• Solution specialists • Database specialists • Engineers (system and support) • Integrated developers • Solutions architects in telecommunications and ICT • Network analysts • System integration specialists • Information technology (IT) security specialists
5. Engineering	• About 40 occupations listed, including energy engineers, chemical engineers, metallurgical engineers, civil engineers, electrical engineers, telecommunications engineers, amongst others
6. Life and Earth Environmental Engineers	• Over 30 listed occupations, including environmental engineers, laboratory technologists and technicians, industrial pharmacists, bio-economists, amongst others
7. Health Professions Medical Superintendent and Related Clinical Sciences	• General and specialist medical practitioners, nursing professionals, public health physicians, amongst others

Scarce skills fields	Examples of occupations/professions in demand
8. Professionals and Associate Professionals	• Nearly 40 listed occupations, including mining technicians, land and engineering surveyors, organisation and methods analysts, amongst others
9. Trades	• Moulders, millwrights, boilermakers (for strategic infrastructure projects), riggers, industrial machinery mechanics, amongst others
10. Business Process Outsourcing (BPO)	• Customer service managers, software development outsourcing engineers and managers, quality assurance specialists or auditors, amongst others
11. Academics and Researchers	• Doctoral graduates in various scientific and technological fields

(Source: Kwach, 2019).

As indicated in the previous section, the skills shortages in the country are driven by a lack of STEM-related qualifications and skills in the labour force. The table above reflects this narrative, with most occupational and skills shortages occurring in engineering, the sciences and technical fields, as well as in information and communication technology. Based on the OECD Skills for Jobs database, in SA, the skills most in shortage are complex problem-solving skills, social skills and technical skills (DHET, 2019c). Other major skills shortages are active learning, reading comprehension, learning strategies, writing and critical thinking skills, as shown in the diagram below (DHET, 2019c).

Diagram 1: Skills shortage index for skills in SA, 2016 [shortage (+); surplus (-)]



(Source: DHET, 2019c, derived from the OECD Skills for Jobs database).

As reflected by each industry SETA, administration and management; computers and electronics; economics and accounting; and mechanical skills are the most common skills shortages in most industries (DHET, 2019c). The OECD database also shows that financial resources management; programming; science; operations analysis; critical thinking and reading comprehension were some of the more common shortages in knowledge in South African industries before COVID-19 (DHET, 2019c). Active listening was particularly prevalent in service-related or customer-facing industries (DHET, 2019c).

In addition, in comparison to OECD countries with a similar picture, SA has a higher instance of under-qualification in proportion to over-qualified workers (DHET, 2019c). The OECD data also show that a considerable share of about 32% of workers in the country were mismatched by field of study (DHET, 2019c). This is likely indicative of the shortage of jobs in the country, which results in qualified or skilled workers taking up positions that are not in their field of study. It also speaks to the high level of skills mismatches in the economy. On one hand, the poor

supply of STEM majors through the higher education system fails to meet the demand for STEM-related qualifications in the market. On the other hand, the high level of unemployment likely influences the career choices of young people, who pursue studies that will secure employment as opposed to learning in their areas of strengths or interest.

Globally, before the pandemic, job trends reflected automation, disruptions to work through new technologies such as digitalisation and AI, as well as growing trade links. Low- and high-wage jobs showed consistent growth (Autor, et al., 2019; McKinsey. 2021). The 4IR, for example, was cited as transformative for economic growth and human potential in the same way as previous industrial revolutions, including electrification, mass production and electronic communications (Autor, et al., 2019). These changes yielded job losses and 'occupational disruptions', typically in middle-wage occupations in manufacturing and some office work (Autor, et al., 2019; McKinsey, 2021). The pandemic, in contrast, has impacted low-wage positions the most—therefore, it is estimated that labour demand will grow for high-wage jobs going forward (McKinsey, 2021).

Based on historical trends, transformative economic eras have brought about "painful" labour market adjustments, including devaluing specific skill sets, rendering certain occupations insignificant and eliminating entire industries (Autor, et al., 2019, p.20). Industrial changes have transformed human work in three ways, i.e. via substitution, complementarity and new task creation (Autor, et al., 2019). The COVID-19 pandemic, together with the acceleration of the 4IR, will transform work in all these ways and to varying degrees. Not only will new skills and upskilling be required for relevance in most occupations, but some jobs will be wholly displaced as a result.

5.2.2.2. Skills needs following the crisis of the pandemic

SETAs were established to bridge the gap between the signals of demand and what is supplied into the labour market through skills development interventions. These interventions involve key role-players on both ends of supply and demand and are informed by research involving these role-players.

The SETAs that represent the economic sectors with a significant share of employment in the country are community, social and personal services (23.6% of jobs); wholesale and retail trade (20.4% of jobs); financial intermediation, insurance, real estate and business (15.4% of jobs); and manufacturing (9.9% of jobs), according to Q4:2020 data (Stats SA, 2021a).

These sectors will likely be highly impacted by jobs and skills changes as a result of the pandemic, and these changes will reflect in the national employment numbers. Beyond changes in employment, these changes will also reflect in the industries' ability to absorb new entrants in the short to medium term. The changes will also be seen in the employment-creation strategies of government and other key players in the economy.

The changes in employment and employment-creating strategies will likely be mirrored in the sectors where employment can be significantly impacted. Will there be significant job losses for some occupations? Which occupations will require the most upskilling and reskilling for workers to retain employment? What types of skills interventions will industries find more effective in retaining productivity? Which skills will show redundance, and which will become more significant? These are some of the questions that will find relevance in observing changes in employment through the various economic sectors in the country.

The SETAs and their research and skills planning instruments can shed light on these and other enquiries.

A Sector Skills Plan (SSP) is a research and skills planning instrument used by SETAs to inform skills development interventions for the respective sectors in the economy. SSPs are informed by labour market demand and trends and are instrumental in determining the nature and extent of skills shortages in key economic sectors. Moreover, SSPs are aligned with the DHET's framework for the research outputs, as well as with the NSDS outcomes-orientated approach (SSETA, 2019). The SSPs are used, too, for identifying which skills interventions are needed to overcome such shortages and how to meet labour market demands in each sector. Current updates inform the skills planning for the period of 2020–2025.

While the researcher would have preferred, for this study, to report on the SSPs for the sectors with significant employment, not all the SETAs have published SSP updates for the 2020/21 or 2021/22 periods. For instance, the Wholesale and Retail SETA (W&RSETA), whose last available SSP update is for 2019/20, is less relevant for this section. Other SSP updates for 2020/21 were finalised in 2019 and make no reference to the COVID-19 pandemic, e.g. the Services SETA (SSETA). In the latter case, the SSP will still be referenced since it represents extensive industry and employment coverage, and the update does consider emerging trends. The latest SSP updates, at the time of writing, are for the 2021/22 period and were finalised and published in August 2020.

Considering these factors, the choice of SSPs is thereby determined by the quality, relevance and comprehensiveness of the data presented for the sector. The relevance of the economic sectors the SETA represents is also considered. The quality and integrity of this information impact the quality of data reported in this research study, and careful consideration is applied to the data and information sources throughout.

The following SSPs are used to describe the skills needs in SA for the 2020–2025 period.

- SSETA Sector Skills Plan (SSP) update for 2020/21
- Finance and Accounting Services SETA (FASSET) SSP update for 2021/22
- Insurance SETA SSP update for 2021/22
- Media, Information and Communication Technologies SETA (MICT SETA) SSP update for 2021/22
- Banking SETA (BANK SETA) SSP update for 2021/22

SSETA is the biggest SETA in terms of scope and industry coverage, comprising 70 Standard Industrial Classification (SIC) codes that are categorised into 16 sub-sectors (SSETA, 2019). These sub-sectors are further grouped into six chambers of the SETA, including Cleaning and Hiring Services; Communications and Marketing Services; Labour and Collective Services; Management and Business Services; Personal Care Services; and Real Estate and Related Services (SSETA, 2019).

FASSET is the largest employer of people with financial management, accounting and auditing skills (FASSET, 2020). There are 16 SIC codes allocated to the sector, grouped into seven sub-sectors or chambers (FASSET, 2020). The chambers include Investment Entities and Trusts and Company Secretary Services; Stockbroking and Financial Markets; Development Organisations; Accounting, Bookkeeping, Auditing and Tax Services; Activities Auxiliary to Financial Intermediation; Business and Management Consulting Services; and SARS and Government Departments (FASSET, 2020).

The MICT SETA is located between content, commerce, community and the tools that support them. The skills needs found in the MICT sector are required throughout the economy (MICT SETA, 2020). There are 45 SIC codes allocated to the sector, grouped into five wide-ranging but interrelated sub-sectors or chambers (MICT SETA, 2020). The chambers include Advertising; Film and Electronic Media; Electronics; Information Technology; and Telecommunications (MICT SETA, 2020).

The BANK SETA encompasses the economic activities that give access to funding/finance, wealth creation for consumption purposes and other economic productivity activities, which include banking, investments, savings, finance and credit (BANK SETA, 2020). The banking system is a key driver of the SA economy. The sector is not formally dissected into sub-sectors but refers to banking and non-banking/alternative services (BANK SETA, 2020). Seven SIC codes are allocated to the sector (BANK SETA, 2020).

Tables 6 to 8 depict the occupational shortages, skills gaps and key change drivers identified in the different industries in SA through the SSPs of the respective SETAs. These aspects are considered to signal labour market shifts, as well as inform demand, which assists SETAs and other PSET role-players to plan for the supply side. The table below lists the latest and most indicated hard-to-fill vacancies (HTFVs) in at least three sectors.[22]

[22] Hard-to-fill vacancies (HTFVs) are also referred to as 'scarce skills', particularly in SETAs' research. "HTFVs are a strong labour market signal of occupational demand. They are typically defined as vacancies that employers are unable to fill within 12 months, or it takes longer than six months to find a suitable qualified and experienced candidate" (FASSET, 2020). HTFVs or 'scarce skills' are identified by employers through their annual WSP/ATR (Workplace Skills Plan and Annual Training Report) submissions.

Table 6: Occupational shortages (HTFVs) in the different industries, 2020–2022

SSETA	FASSET	MICT SETA	BANK SETA
Healthcare cleaners	ICT professionals	Software developers	Sales managers
Environmental control officers	Actuaries and statisticians	Computer network and systems engineers	Credit managers
Account managers, officers	Accountants and auditors	ICT systems analysts	Compliance officers
Business analysts	Management consultants	ICT security specialists	Investment managers
Digital marketers	Investments practitioners	Developer programmers	Organisational risk managers
Marketing managers	Internal auditors and risk managers	Telecommunications technicians, engineers	Financial investment advisors
Software engineers, developers	Sales and marketing professionals	Multimedia specialists	Customer service managers
Payroll clerks	Human resources and related professionals	Digital artists	Finance managers
Labour inspectors	Economists	Media producers	Sales and marketing managers
Project managers	-	-	Developer programmers, software
Production managers (quality)	-	-	Compensation and benefits managers
Assessors	-	-	ICT systems analysts
Training facilitators	-	-	Engineering managers
Sales personnel			Corporate services managers

(Source: SSETA, 2019; FASSET, 2020; MICT SETA, 2020; BANK SETA; 2020).

Findings from the SSPs reveal that some occupational shortages exist because of the change drivers identified for the sectors. For example, occupations involving risk management, compliance, business rescue practitioners, and health and safety may become increasingly important as a result of the pandemic and related measures. Legacy systems will decrease in demand, and the MICT SETA (2020) indicates that as remote work becomes the norm, technologies such as cloud computing will pick up in demand for storing and transferring data. As such, demand for occupations such as cloud architects will emerge alongside increased demand for software developers and developer programmers to develop and maintain virtual platforms (MICT SETA, 2020).

In addition, the SSPs' research shows that ICT-related occupations record some of the highest need. Notably, occupations that are not ICT-related are cited as requiring ICT skills and

competence to perform jobs and tasks. The lack of STEM qualifications also adds to the number of shortages seen in many of the occupations for the different industries. Lack of experience, relevant education and skills are other reasons reported for vacancies that are hard to fill.

According to the Career Junction Index (2021), which reports on labour dynamics based on online hiring activity and job search activity, the most sought-after skills following 2020 are software development, middle department/management skills and sales consulting. The IT (over 25% of demand) and business and management, finance and sale sectors are the most sought-after sectors, while the majority of active jobseekers are in the admin, office and support, business and management, finance and IT (under 10% of supply) sectors (CJI, 2021). While this shows a close correlation between supply and demand for some of the sectors, the demand outweighs the supply for some of the sectors (CJI, 2021).

Based on online hiring activity, the IT, architecture and engineering, manufacturing and assembly, sales, and business and management sectors show the most promising employment prospects (CJI, 2021).

Apart from the specific occupations or qualifications (hard skills) that are short in industries, employers are also concerned with the work-related practical skills or competencies required to perform tasks successfully. These so-called ‘soft skills’ are defined as proficiency, or ‘the ability to do’, and referred to as ‘skills gaps’ or ‘critical skills’ in the South African PSET system. In SA, some technical skills are also considered in this category. The table below lists the key skills gaps of 2021/22 in at least three sectors across occupational levels (senior, middle and lower), unless otherwise stated.

Table 7: Common skills gaps in the different industries, 2020–2022

SSETA	FASSET	MICT SETA	BANK SETA
• Advanced computer skills • Decision-making • Communication • Business etiquette • Interpersonal skills • Conflict resolution, management • Customer care service • Emotional intelligence • Health and safety, first aid	• Conflict management • Negotiating • Entrepreneurial/ business skills • Emotional intelligence • Supervising • Project management • Complex problem-solving • Communication • Computer skills – Microsoft Excel • Customer service • Adaptability • Digital computing	• Business etiquette • Certified skills (CompTIA A+, Network+, MCSA, MCSE, Azure, CISCO, etc.) • Financial management • Communication • Customer service • Python and C (coding languages) • Sale skills • Problem-solving • Leadership • Business Management	• Critical thinking • Complex problem-solving • Management and leadership • Programming • Technical skills • Advanced IT and software • Marketing and sales • Service orientation • Social perceptiveness • Time management • Computer skills (elementary level) • Team work

(Source: SSETA, 2019; FASSET, 2020; MICT SETA, 2020; BANK SETA; 2020).

Most of the skills gaps signify the importance of computer skills and virtual and/or digital computing competence in the future. Industry representatives for FASSET (2020), specifically, confirm that the listed skills in Table 7 will gain prominence following the pandemic and will be regarded as top-up skills going forward. They also identify digital computing, virtual interpersonal skills, adaptability, diversity management, change management, advisory, data analysis, software development and digital client services as future and emerging skills for the financial and accounting services sector (FASSET, 2020).

The different sectors indicated mostly face skills gaps where expert retirees are or were unable to transfer skills to newer entrants (MICT SETA, 2020). New entrants also lack the attitude and initiative that is expected of them in the workplace, which impedes their willingness to learn and take direction (FASSET, 2020). Across the SETAs studied here, industries point to the inadequacies of the education and higher learning institutions that lead to learners being ill-prepared for work.

The SSPs also identify the factors or trends that drive change in the demand and supply of skills for the respective sectors. Table 8 below lists the five key change drivers identified by industry for the different sectors.

Table 8: Key change drivers for the different industries, 2020–2022

SSETA	FASSET	MICT SETA	BANK SETA
• ICT • Globalisation and economic integration • Policy and legislation	• Coronavirus (COVID-19) pandemic • Economic factors • Technology and the 4IR • Globalisation • Changes in regulation and governance	4IR technologies, including those ranked highest for driving change in the sector: • AI • Cloud computing • Big data • 5G • IoT	• Digitalisation and technology • Changing customer expectations • Regulatory changes, risk and cybercrime • Disruptors in banking • Political and economic shifts

(Source: SSETA, 2019; FASSET, 2020; MICT SETA, 2020; BANK SETA; 2020).

The change drivers identified are likely to have implications for skills planning, either positive or negative. As the pandemic has impacted the world and ways of work, many occupations will require top-up skills or reskilling workers to be acclimated to the new ways of doing; the impact of the pandemic also implies that some occupations may become redundant sooner than previously anticipated. Key industry disruptors, such as 4IR technologies, which bring about unprecedented change and opportunity, will be adopted much quicker due to the pandemic. The pandemic has also accelerated the need for digital transformation in many industries. Some jobs may become vulnerable to automation, while others will be modified to accommodate or integrate these technologies into everyday activities.

Together, the pandemic and the advent of the 4IR will continuously present new ways of thinking about work. Rasool (2020a) offers that full-time jobs will steadily diminish as remote and digital work become the norm, and new jobs of different kinds will be created. With this, the requirements for entry into some jobs will change; for example, credentials may become secondary to skills as businesses seek to hire people who possess the right attitude and skills to effectively do the job and thereby improve profitability (Rasool, 2020a). As a result, short courses and micro-learning will gain traction and become more legitimate in the labour market,

> "Quick deskilling, reskilling and upskilling that will enhance the rapid adoption of e-learning tools and platforms will become popular. […] The ability to adapt to the changing nature of work will mean more than the number of qualifications on a CV," states Rasool (2020a).

It will be imperative for sector skills planning and plans to engage with the realities that emerged in 2020; supply-side organisations in the SA PSET system must respond appropriately to emerging needs if they are to remain relevant (Rasool, 2020a). Suggestions for dealing with the trends that surfaced in the 2021/22 updates for the SSPs include:

- Adopting work-integrated learning;
- Upskilling existing personnel for the responsibilities of the future;
- Enhancing existing roles with emerging skill sets to ensure workers are 4IR-ready;
- Higher learning institutions becoming more adaptable and reflective of current industry needs;
- Learners undergoing more practical and technical training in the future and being exposed to future roles within the different industries;
- Learning programmes encouraging more concurrent learning, e.g. workplace-based learning while studying theory; and
- The outlook on training and development in the PSET system reflecting a willingness to invest in 'value skills' (FASSET, 2020).

Responses such as the above should be reflected in future sector skills plans as well as in the training budgets of PSET role-players (Rasool, 2020a). The change drivers and work and skills trends during the pandemic have revealed that future skills development interventions cannot proceed as 'business as usual' (Rasool, 2020a).

Furthermore, global trends mirror those of SA. Frontline workers in retail stores and banks, for example, migrated to e-commerce and other digital transactions during the pandemic, and such behavioural changes are likely to last (McKinsey, 2021; WEF, 2021). Other customer-facing work, including hotels, restaurants, airports and entertainment venues, will likely experience a

decrease in labour demand over time for the same reason (McKinsey, 2021; WEF 2021). Instances of remote work will also increase globally. The geography of work will change as individuals and companies move to suburbs and smaller cities and a hybrid office/remote work approach becomes the preference (Gash, 2020; McKinsey, 2021). However, critical business decisions, brainstorming sessions, providing sensitive feedback and onboarding new employees will continue to find in-person relevance (Gash, 2020; McKinsey, 2021).

Based on the Future of Jobs Survey (WEF, 2020), and as a result of changing trends, globally, the top 20 job roles facing decreasing demand include data entry clerks, administrative roles, accounting, bookkeeping and payroll clerks, accountants and auditors, assembly and factory workers, customer service workers, postal service clerks, bank tellers and related clerks, door-to-door sales, news and street vendors, and human resource specialists.

In contrast, job roles showing increasing demand include data analysts and scientists, AI and machine learning specialists, big data specialists, digital marketing and strategy specialists, and specialists in process automation, digital transformation and the IoT (WEF, 2020). Other roles that appear to take a different shape include organisational development specialists, strategic advisors, management and organisational analysts, and risk management specialists. Similar to the trends seen in South Africa, the roles of software and applications developers, database and network professionals, and information security analysts are also gaining prominence (WEF, 2020). These trends show that the job roles that will grow in demand do require a higher level of skill set.

Thus, the emerging trends will impact the types of jobs most at risk at skill level, too. This study has determined that evolving trends and shifting labour market demand following 2020 will favour high-skilled labour and be less favourable to the poor, low-waged and lower-skilled groups. The following table presents the jobs most at risk as a result of the pandemic and emerging labour trends. The job losses, grouped by skills type, are illustrated as the percentage of total job losses according to ILO research on the economic shock of the pandemic on SA's labour market (Strauss et al., 2020).

Table 9: Economic shock to labour demand by skill level in SA, 2020

	Skilled	Semi-skilled	Low-skilled	Basic or informal
Percentage of total job losses	13.8%	34.8%	22.6%	28.8%
Percentage of contraction	-1.50%	-3.79%	-2.47%	-3.14%

(Source: Strauss et al., 2020).

As shown in the table, over 86% of the jobs in SA at risk due to changing labour demand are located in unskilled, low-skilled and semi-skilled labour, while only 13.8% of those jobs at risk are skilled jobs. Jobs in the informal sector are also at high risk in the face of emerging trends and economic demand. The prospects for low-skilled workers in the economy are dependent on several factors, including the demand for skills and the structure of future occupational employment, which leans toward increasing high-level skills in the labour market (Hasluck, 2011).

In 2011, Hasluck (p.27) observed that this shifting labour demand will remain a critical issue in the long run because people with lower-level skills will have reduced access to low-skilled jobs as the labour market grows more competitive and jobs are taken up by those with 'better' qualifications and skills. Hasluck (2011) also observed that the jobs of the future will demand new and different skills and qualifications which those already disadvantaged with low skills will struggle to access. The changing skills trends observed in this sub-section attest to these concerns. High-tech, technologically capable, remote and digitalised jobs will squeeze disadvantaged people out of the labour market of the unfolding future at an even faster rate than anticipated.

Such technological trends are undeniably instrumental in future work. Autor, et al. (2020) state that technologies have enabled work to continue during the COVID-19 pandemic. Online services and remote learning and working use tools that are considered as forms of automation (Autor, et al., 2020). Again, this shift has unavoidably affected vulnerable workers in customer-facing industries whose jobs cannot be effectively done through computing platforms (Autor, et al., 2020). The large-scale impact of the pandemic on rapid technology advancement could not have been anticipated before 2020, but its effects will linger beyond the foreseeable future.

More importantly, the combined impact of the pandemic and technology reveals inherent economic insecurity and job stability for people in many economies, and this is regarded as being more disruptive than the changing trends of the present day (Autor, et al., 2020).

Nevertheless, international literature asserts that future inclusive economic growth requires a "multiplicity of skills" (World Bank, 2018). Smart investments in skills development aimed at three policy areas—productivity growth, inclusion and adaptability—are crucial to countries' economic transformation (World Bank, 2018). With the rapid changes seen in the demand for skills, a multiplicity of skills is needed in fast-changing labour markets (World Bank, 2018). Here, the World Bank (2018) refers to cognitive skills, higher-order problem solving, creative thinking, social-emotional skills (including grit, empathy and curiosity) and technical skills.

Collectively, these skills can be termed 'employability skills'.[23] Employability skills themselves are regarded as "indispensable" in the current era and more recently encompass teamwork, problem-solving, communication and technological skills (Fajaryati et al., 2020). Continuous learning ability and adaptability skills are also a growing demand in this category (Fajaryati et al., 2020).

According to the results of the Future of Jobs Survey (WEF, 2020), the following are regarded as the top 15 skills that will be needed in 2025.

[23] 'Employability skills' are the basic skills necessary for getting, keeping and doing well on a job, and are also referred to 'job-readiness' skills that help workers fit into and remain in the work environment (Robinson, 2000). Employability skills are sought after by employers to create an empowered, high-performance workforce needed for competitiveness in today's economy (Robinson, 2000). More specifically, "unlike occupational or technical skills, employability skills are generic in nature rather than job-specific and cut across all industry types, business sizes, and job levels from the entry-level worker to the senior-most position" (Robinson, 2000).

Table 10: Top 15 skills needs of 2025, globally

Top 15 skills for 2025	
1. Analytical thinking and innovation 2. Active learning and learning strategies 3. Complex problem-solving 4. Critical thinking and analysis 5. Creativity, originality and initiative 6. Leadership and social influence 7. Technology use, monitoring and control 8. Technology design and programming	9. Resilience, stress tolerance and flexibility 10. Reasoning, problem-solving and ideation 11. Emotional intelligence 12. Troubleshooting and user experience 13. Service orientation 14. Systems analysis and evaluation 15. Persuasion and negotiation

(Source: WEF, 2020).

With this growing demand for employable candidates (those who possess both core skills and subject knowledge) from employers, research finds that learning institutions and supply-side organisations must prepare learners adequately with both technical and employability skills (Allais, 2012; Fajaryati et al., 2020). Since employability skills are considered as the knowledge, skills and competencies that workers need to have to improve their ability to get and keep a job, these skills will benefit workers or labour market entrants at each skill level in the future (Allais, 2012; Fajaryati et al., 2020). The South African PSET system should then be able to identify employability skills along with emerging skills needs to ensure no one gets left behind in the post-COVID-19 and 4IR disruption era.

Many countries in Africa have experienced a high demand for digital solutions in production, learning and skills development triggered by national lockdowns (Hustaedt, et. al., 2020). As such, recovery strategies for African countries would entail making skills development urgent and integral to developing human capacities (Afeti, 2020). Moreover, the COVID-19 crisis has highlighted the following focus areas for recovery in many African countries:

- Skills training mitigation measures;
- Digital skills training to enhance employability in a world of social distancing;

- The continuation of skills development despite physical barriers as digital literacy will be a part of work at all skills levels long after the health and safety measures of the pandemic have been dismantled;
- Supporting women, youth and vulnerable groups to increase their employability and enterprise creation abilities; and
- Training innovations in informal sectors. These workers will need to be skilled in the use of apps and online tools, such as e-commerce solutions, to survive. Such training will also give them the ability to manage their work and business in trying times and in the future (Afeti, 2020).

Section 5.1 discussed the disproportionate impact of the pandemic on vulnerable groups, young people, and informal and lower-skilled workers. Recovery solutions for the Africa region cannot ignore structural issues in post-crisis approaches. Empowering young people with skills will be integral as local or domestic sourcing, trade and services continue to be the first point of order for business and production with social distancing measures still in place across the world (Hustaedt, et. al., 2020). Moreover, industrial policies that favour national and regional value chains will be needed to support this movement of local industry growth for SA and the African continent (Hustaedt, et. al., 2020).

It will be important for SA, Africa and most of the developing world to respond to current and existing demands. However, it will be equally important for these economies to be proactive and anticipate the skills that will be required to support strategic and sustainable economic and social growth post-COVID-19.

5.3. South Africa's readiness in relation to changing skills needs

This study has shown that the COVID-19 crisis will have a lasting impact on jobs and skills development, not only in South Africa but across the world. The post-pandemic world will see a shift in the relationship between work, skills and learning that will directly shape policymaking. Moreover, emerging 4IR technologies and the changing world of work (which was accelerated by pandemic-related effects) mean that the anticipated industrial changes of the future are already happening today. However, while the issues presented by these rapid changes require

considered resolve, the expectations for policy must be realistic and cognisant of a country's structural dynamics.

South Africa's challenges with high unemployment, low skills and a weak economy are persistent and pervasive. They pose obstacles for the economy to adapt to sudden, dynamic and fast-changing demands. Strong and sustained economic growth is a critical pathway out of poverty for developing economies, and it is recognised as a key driver of human development for all economies (DFID, 2008; National Treasury, 2019). However, SA's unsustainable economic trajectory hinders the realisation of many developmental objectives, including those of education and skills development toward poverty alleviation and unemployment reduction (National Treasury, 2019).

SA's skills development regime, as envisaged through the NSDS, also faces structural imbalances in the labour market, a high rate of low skills in a competitive global market, and the reluctance of employers in recognising the productivity and growth benefits of skills development efforts for the overall economy and inside the workplace (Badroodien, 2004; Reddy et al., 2018a). The learning programmes developed within the structure of the NSDS—such as learnerships, internships, apprenticeships, productivity-orientated curriculum changes and other skills programmes, as well as hiring incentives—tend to have a positive impact on low-skilled and unemployed adults and youths (Groener, 2013; Treat, 2014). However, SA's persistent structural imbalances require more favourable economic and political conditions for skills development efforts to be truly successful and sustainable; without these conditions, the aforementioned efforts appear "superficial" (Groener, 2013; Treat, 2014). Groener (2013) identifies that some of SA's structural issues are major impediments in the country's efforts toward successful skills development, as evidenced by the limited changes and/or redress seen in unemployment and income inequality.

The pre-1994 regime provided no job-creation strategies that were linked to economic growth strategies, and as Kraak (2004a) put it, it "did not have the institutional linkages that could effectively deliver a macro plan for the socioeconomic development of the country". In contrast, the post-1994 regime intended to create the institutional linkages that would provide "important kickstart" benefits for the economy through reforming the education and skills system and by

being more responsive to the economic needs of the country (Kraak, 2004a; Allais, 2012; Powell et al., 2016). However, it has been challenging for post-1994 administrations, plagued by legacy inefficiencies, to foster a well-performing skills system (Kraak, 2004b; Kraak, et. al., 2013). A lack of capacity, alongside the attempts to transform the economy within 30 years while keeping people out of social and economic destitution, is an arduous challenge that calls for a differentiated model unique to the country (Kraak, 2004b).

As such, SA's historical legacy combined with neoliberal economic policy reforms proved to be a contradictory approach to development (Ngcwangu, 2014; Allais & Nathan, 2014). Ngcwangu (2014) asserts that the inherent ideological and political contestations in South Africa's framework of policy development contribute to what can be termed a "crisis of skills development". Referring to Gary Becker's theory on human capital development, which asserts that the market defines skills, Ngcwangu (2014) states that this rationale is problematic as applied in South Africa.

According to Ngcwangu (2014, pp. 245-246), SA's developmental policies, plans, job-creation schemes and education policies suppose that its pre-existing market can "readily" absorb skilled individuals; Ngcwangu further states that it is "naïve" to assume employers will respond to economic competitiveness by making investments in upgrading skills throughout the economy. Human capital development approaches, particularly as applied in neoliberal-led policies, thus insufficiently describe the forces that drive skills development or the development of human beings (Ngcwangu, 2014; Treat, 2014). In the current political economy, issues of income distribution, opportunity, political participation, and individual interests and collective goals all have an impact on national skills development strategies (Ngcwangu, 2014). Another issue that is ignored in human capital development discourse is that underemployment in an economy leads to an increase in the learning efforts of individuals, which, in turn, cannot be supported by the economy due to a lack of jobs (Ngcwangu, 2014).

In South Africa, underemployment is exposed through the cohort of citizens with high-level qualifications in employment that "rewards" them less than appropriate for their acquired skill set or knowledge base (Ngcwangu, 2014). Therefore, while efforts to identify skills shortages and scarce skills in the economy play a critical role in ensuring that the supply side of the labour

market aligns with market needs, they do not fully account for the flawed, structural approaches in SA's economic and developmental policy and framework. The neoliberal concept of 'skilling' asserts that if skills are in the market, jobs will follow, and this aligns with South Africa's job-creation strategies, which, as stated, ignore inherent structural and contextual issues that refute this idea (Badroodien, 2004; Groener, 2013; Ngcwangu, 2014; Allais & Nathan, 2014).

Moreover, the neoliberal concept of 'skilling' social policy needs is secondary to the intervening and competitive forces of the economy and labour market (Ngcwangu, 2014). In the context of SA, this is problematic because while education and skills are seen as drivers of social development, employers in the labour market show low participation toward these efforts (Badroodien, 2004; Ngcwangu, 2014; Treat, 2014). Allais and Nathan (2014) agree that the nature and structure of the labour market are key in determining the quality of education, training and skills that go into the economy. The lack of data from the demand side of the labour market also distorts efforts and makes sector skills planning and similar processes difficult from the supply side (Ngcwangu, 2014; Allais & Nathan, 2014).

Skills development undertaken for compliance also impacts the reporting and success rate of efforts in the country (Ngcwangu, 2014). The cynicism of state-driven skills development is disconcerting for many as organised business is a main beneficiary of the skills system and its programmes (Ngcwangu, 2014; Treat, 2014). Ultimately, Ngcwangu (2014) contends that the economic environment of the country must be "equitable and systematically democratic" to enable a well-articulated skills development system and mechanism.

There are other challenges facing skills development in SA that extend beyond structural issues and deficiencies in the country's neoliberal labour market. Before the onset of the pandemic, the world was already reckoning with the industrial concepts of the 4IR. The adoption of 4IR across industries was only accelerated by the events of 2020. In addressing skills planning for a disruptive future, Hattingh (2016), referring to World Economic Forum (WEF) statistics, writes that SA has an insufficient understanding of disruptive changes and that its workforce strategy is not aligned with innovation strategy.

Hattingh (2016) further outlines some main concerns around the current training system:

- Occupational qualifications are not sufficiently preparing the workforce, with many occupations becoming outdated or radically different.
- People are not being equipped with the skills needed in a transformed and disruptive environment.
- SETA grants, NQF training credits and B-BBEE Scorecard points result in training that is not focused on developing enduring and innovative skills.

The changes required in the skills system must use less cumbersome mechanisms, and the workforce must be geared to move across occupations (Hattingh, 2016). In addition, shorter interventions must be conceptualised to develop workers to adapt to unfamiliar technologies and projects (Hattingh, 2016). These changes will require concerted and coordinated application by all the key role-players involved in the skills development system, including employers, SETAs, government and policymakers (Hattingh, 2016). Mzekandaba (2019) states that higher learning institutions should lead the new industrial revolution by increasing the number of programmes geared toward preparing learners for the 4IR. The digital component of most jobs will increase because of the 4IR; therefore, the current and future workforce must be adequately prepared in a demand-led skills development system (Mzekandaba, 2019).

Consistent with the preceding perspectives, the National Digital and Future Skills Strategy for South Africa (DCDT, 2020, p.11) states,

> "If the world is indeed experiencing a skills revolution, then it is impossible to limit the landscape of skills development to a choice or selection of particular skills over and above others, as it would be impossible to predict which skills will be most needed. […] It can be argued that every job either is changing or will change, as digital technologies penetrate more and more economic and social activities."

The strategy recognises that the success of its implementation has implications for the economy, society and education and calls on education sectors, including SETAs, to focus on and invest in digital skills as well as the development of digital innovation in agriculture, mining, manufacturing and health services, amongst others (DCDT, 2020). Other implications involve paying attention to cybersecurity skills, for which programming should be taught at the school

level, while monitoring and evaluation will be required to build strong resilience for strategy (DCDT, 2020). The strategy is timely and addresses some of the core concerns that could plague SA's skills development system as it readies itself for changing skills needs.

However, the drive towards a digital economy and skills base introduces new challenges to the South African predicament—those of the digital divide.[24] Digital technology has enabled the continuation of work, learning and communication amidst pandemic-related measures such as social distancing (Turianskyi, 2020). However, for the millions of people with no access to technology or the Internet, continued economic and social isolation remains a risk in this new era (Turianskyi, 2020). The factors that contribute to the digital divide, most commonly seen in developing or less-developed countries, include socio-economic or affordability issues, weak ICT infrastructure, poor access to information and communication, and digital blackouts or internet shutdowns due to political interference (Turianskyi, 2020). According to research statistics, at the end of 2019, the internet penetration rate in Africa was 39.3% compared to 53.6% in Asia and 87.2% and 94.6% in Europe and North America, respectively (Turianskyi, 2020).

Based on this context, again, as it pertains to the structural challenges of the country, SA, with its limited ICT infrastructure and its dearth of 4IR expertise relative to the global economy, cannot adopt 4IR practices as readily as the rest of the developed world (NPC, 2020). The benefits and risks of 4IR application and implementation in the economy and society should be interpreted for the uniquely South African situation to prevent policy decisions that may have to be corrected twenty years later. The NPC (2020, p.79), on SA's readiness for the 4IR, proposes the following considerations be taken to ensure that the country's adoption of a digital economy is not uneven and unequitable.

> "Can we identify risks associated with such technological developments? Can we safeguard citizens from the potential harms that accompany the 4IR? How can we mitigate the risks? Perhaps most importantly, how do we ensure that the digital inequality that exists in South Africa today is not exacerbated by the unfettered adoption of new

[24] The 'digital divide' is a term that refers to the uneven access to or distribution of ICT in societies; it is a global problem and is considered a 'wicked' policy issue (Turianskyi, 2020; NPC, 2020).

> technologies and systems that are optimised on grounds of efficiency and productivity alone? How do we ensure that no one is left behind, as our politicians have promised?"

These questions will help to determine that fair and equitable decisions are taken in the policymaking towards a digital future. The objectives of such policymaking should aim to still deliver on economic and social development imperatives, such as poverty reduction, equality and job creation or improved employment (NPC, 2020). The perceived negative effects of advanced technologies introduced by the 4IR cannot be ignored in the South African context as they present a definite threat to the job security of many occupations across industries. Fundamentally,

> "From a policy perspective, it is critical to ensure that the preconditions necessary for harnessing the benefits of the 4IR are met, if the technologies are to serve developmental purposes, rather than exacerbate existing social, economic and political inequalities" (NPC, 2020, p.80).

In line with this, certain preconditions must be met in the policy and regulatory environment of SA to ensure a digital economy can be adapted to the country. The enablers and preconditions include open data, or data as a public good, governance, enabling infrastructure, human capital development, investment in science, technology and innovation, smart townships, higher education, and a skills base for a digital economy, amongst others (NPC, 2020).

In terms of alignment with international developmental objectives, South Africa's challenge with achieving the objectives of the SDGs is expected to worsen as a result of the COVID-19 pandemic (UNDP, 2020). Particular challenges relating to skills and development include achieving SDGs 4, 8 and 10 (i.e. quality education; decent work and economic growth; and reduced inequalities, respectively) (UNDP, 2020). Some of South Africa's challenges related to SDG 4 include low grades and participation rates, high drop-out rates amongst people with disabilities, and limited internet access, which is critical for access to school and work under the pandemic-related lockdown restrictions (UNDP, 2020). Challenges related to SDG 8 include high unemployment and the de-industrialisation of SA's economy, while race, geography,

education, age and access to labour markets remain key drivers of inequality in SA as a challenge for SDG 10 (UNDP, 2020).

The research in this section critically reflects on the credibility of South Africa's current skills development and skills planning system. The research posits that skills policy in the country should be driven by more than just its responsiveness to urgent, market-driven demands. Moreover, the contextual and structural complexities in the country and the overall skills development mechanism must be acknowledged and effectively addressed. It is also apparent, as posited by McGrath (2004), that policies for skills development are an interaction between broader educational policies, active labour market policies, industrial policies, science and technology policies, as well as other macroeconomic and fiscal considerations.

Per the research literature presented in this section, it is also apparent that developmental policies are shaped by internal and external economic and ideological forces, as well as being influenced by "multiple and complex" historical legacies (McGrath, 2004). As such, the research indicates that the success of skills development and planning will rely on interrogating and interpreting the barriers within the wider context of the country. In other words, a responsive skills development system in South Africa will consider all influencing factors and challenges.

McGrath (2004) also states that the strength of a political economy approach to skills development is often seen in the "conjoining" of national and international trends, influences and pressures; however, these linkages must manifest in "specific national forms". Also, such national forms must reflect understandings of the past, present and visions of the future— thus, a skills system, through all its influences, cannot be a static system (McGrath, 2004).

Based on the interpretations detailed in this section, it appears that South Africa's readiness in relation to changing skills needs is questionable. The country's current skills development policy, system and environment may be ill-prepared for a more evolved set of demands, for the many reasons explored. The fast-paced demands of the market in 2020 and beyond may not give the South African PSET system the leeway it needs to correct the deficiencies already present, and likely to persist, in the skills development system. Emerging trends may even threaten the foundations of the current skills development system, which is led by a neoliberal

approach to human capital development, i.e. demand-driven development. This means that the adoption of 4IR and work-related changes effected by the pandemic, such as remote and virtual work, will drive the direction of skills development efforts in the country over the next five to ten years, or at least until the next global event. The next section explores how skills development is unfolding in the COVID-19 and 4IR era.

5.3.1. Human capital development approach following the crisis

As identified, South Africa's approach to skills development is guided by market-related demand in a neoliberal economy. The country's human capital development approach is also guided by human resource planning and development research and policymaking. This approach is underscored by the belief that addressing skills and occupational shortages in the country will boost employment, entrepreneurship and, subsequently, economic growth, combatting South Africa's triple challenge. As such, the policies and practices adopted by the government in enabling education and skills development are critical for its human capital development. The crisis of the pandemic threatens to undermine the social, political and economic progress the country has made in this regard.

According to research (Kruss, 2004; McGrath, 2010; Holborow, 2012; Vally & Motala, 2014; Spring 2015; Ngepah et al., 2021), there is a definite causal relationship between education and skills development and the growth of an economy when fostered through human capital development, which includes exploiting education and skills development for innovation, higher productivity levels, knowledge-production and, more recently, technological advancement (Ngepah et al., 2021). Therefore, the South African government developed a salient and timely policy framework to absorb the impact of the pandemic on the economy and its human capital.

The Economic Reconstruction and Recovery Plan (ERRP), tabled in October 2020, sets out the government's priority interventions to enable the recovery of the economy following the crisis (South African Government, 2020). The ERRP is structured into three phases: a comprehensive health response, economic restoration, and the "reconstruction and transformation" of the economy (South African Government, 2020). The third phase entails

building a “sustainable, resilient and inclusive economy” in line with the priority interventions of the ERRP (South African Government, 2020).

The priority interventions, corresponding with the developmental challenges identified in this study, call for job-creation strategies to be achieved through infrastructure investment, reindustrialisation, growing small business and creating a capable state, amongst others (South African Government, 2020). The acceleration of other priority economic reforms includes the economic inclusion of women and youth, mass employment interventions, and other sustainable macro-economic interventions, such as boosting innovation, skills and education. The plan further proposes that the priority interventions can be achieved, or enabled, through resource mobilisation, regulatory changes, a supportive policy environment, social compacting, economic diplomacy, regional integration and skills development (South African Government, 2020).

The priority interventions of the ERRP, therefore, highlight not only that the negative impacts of the pandemic be alleviated, but also that the implications of the pandemic on the country’s human capital must be diverted. Key areas of human development are addressed in the ERRP, including education, health, food security, poverty alleviation, protecting vulnerable groups and households, and the empowerment of women and youth through inclusive economic interventions.

One of the key growth-enhancing measures and high-impact enablers recognised in the ERRP is skills development. Skills development, in the ERRP, is required to build a skills base that is more demand-led and responsive to the changing nature of work, including through upskilling and other enabling initiatives such as access to online learning and opportunities (South African Government, 2020). This is in line with changes and skills development approaches being taken in other parts of the world, as well as furthering the current agenda of developing skills in critical and scarce skills areas, OIHD and priority occupations of SETAs. Policy interventions will be rolled out to build the country’s digital skills, digital capacity and competitiveness in line with the jobs of the future (South African Government, 2020).

The Economic Reconstruction and Recovery Skills Strategy, drafted in January 2021, is centred within skills planning and emphasises that skills development initiatives are critical enablers of economic recovery and reconstruction efforts. The ERR Skills Strategy supports both the management of COVID-19 and the economic and social recovery of the economy (DHET, 2021). The ERR Skills Strategy is intended to enable the immediate roll-out of skills development interventions in support of the ERRP by balancing short- and long-term skills needs and shortages (DHET, 2021). Key skills development institutions, such as SETAs, are encouraged to support skills planning, industry engagement, funding and workplace-based learning toward this end (DHET, 2021).

The ERR Skills Strategy envisions that the entire PSET system, as an expression of the NDP, contributes to delivering the mandate of the economic recovery plan following the crisis. Key government departments must also be responsive and supportive and ensure that constraints do not become major impediments in achieving the objectives of the ERR Skills Strategy. The strategy also recognises the significant progress that has been made in human capital efforts through skills development in the country, and this lays the foundation for short-term responsiveness— in either preparedness or adequacy (DHET, 2021).

Through the ERRP and the ERR Skills Strategy, the South African government is effectively responding to the human capital needs of the economy following the pandemic. By advocating for various interventions in the economy that prioritise the human-centric needs of the country, these policy instruments can successfully support the recovery and reconstruction needed following the crisis. Existing structures can be maximised to make a growth opportunity of a historical moment of the current century. The ERRP and the ERR Skills Strategy, in contrast to past policies, are framed around the principles of human capital development through boosting the human capability of the economy via education, skills and innovation.

5.4. Skills development in the future

The findings in this research study have ascertained the economic impact of the COVID-19 global crisis on South Africa’s employment, jobs and skills. The study has also identified the emerging trends of the 4IR that have been fast-tracked as a result of the health and safety

measures (especially social distancing) instituted to curb the spread of the coronavirus. Furthermore, the study has assessed the economic repercussions of the pandemic and how emerging trends may forever alter the shape of work and business. Insights were drawn mostly from South African studies, statistics and literature, but comparisons to global trends were made where relevant. This section specifically explores the implications of the aforementioned trends, or sub-chapters, to identify how skills development policy and practices are likely to unfold, both globally and domestically, in the foreseeable future.

Across the world, national economies have recognised that the COVID-19 pandemic has "accelerated and exacerbated" the gravity of upskilling and reskilling people with the right skills for available jobs (PwC, 2021). The Davos Agenda 2021 (WEF, 2021) highlights that the pandemic demonstrated that "no institution or individual alone can address the economic, environmental, social and technological challenges of our complex, interdependent world". As identified in the findings in this research, some of the trends of a changing world of work and learning were already apparent; however, the pandemic accelerated these "systemic" changes (WEF, 2021).

The Davos Agenda, based on the urgency of response from governments and other global leaders and role-players, posits three ways to move forward. The first entails closing the skills gaps through lifelong learning and upskilling, proactive redeployment and re-employment, innovative skills funding models, and skills anticipation and job market insight; the second entails making workplaces more inclusive; and the third entails prioritising health and well-being through adopting new approaches to improve employee experience, engagement and motivation (Sault, 2021; WEF, 2021).

The PwC report (2021) estimates that global GDP growth of USD 6.5 trillion could be obtained with 5.3 million new net jobs created by 2030 if countries upskill citizens in line with OECD industry best practices.[25] More developed countries will see smaller gains (Japan 2%, Germany 0.2%) compared to developing countries because they already have a strong productivity and

[25] The focus countries in the PwC report (2021) are Australia, Canada, China, France, Germany, India, Japan, South Africa, Spain, the United Arab Emirates, the United Kingdom and the United States. The regions include Asia-Pacific, Benelux (including Belgium, Luxembourg and the Netherlands), Central and Eastern Europe, Latin America, the Middle East, North Africa and Turkey, North America, Sub-Saharan Africa and Western Europe.

skills base (PwC, 2021). Meanwhile, from a regional perspective, Sub-Saharan Africa and Latin America can expect gains of about 7.8% and 7.7%, respectively, as a percentage of GDP if they boost investment in upskilling (PwC, 2021). The regions and economies with large skills gaps have the most potential to improve productivity through skills expansion aligned with new technology (PwC, 2021).

South Africa, specifically, can expect gains of 4.4% (PwC, 2021). Other emerging markets, such as China and India, can expect gains of 7.5% and 6.8%, respectively (PwC, 2021). The development of an upskilled workforce across the world, following the pandemic, could make the global economy more knowledge-intensive, with people working alongside technology and machines in productive manners (PwC, 2021). The sectors that are expected to gain from such shifts include business services, consumer services and manufacturing sectors; health and social care could also grow GDP through upskilling by 2030 (PwC, 2021).

These forecasts for GDP gains based on wide-scale investment in upskilling can be realised around 2025. According to PwC (2021, p.4) data, GDP growth obtained through upskilling efforts will be slow following 2020 as economies formulate necessary upskilling initiatives; around 2025, upskilling initiatives will gain momentum, translating into improved labour productivity boosting economic growth. Toward the end of the ten-year period (2020–2030), the economic trajectory would stabilise.

Job creation through upskilling creates the potential for human labour, and thus employment, to increase if effectively complemented with new technologies—instead of jobs being replaced by new technologies, new technologies can improve the quality of certain jobs (PwC, 2021). While the need for IT skills will balloon, so too will the number of jobs that require creativity, innovation and empathy (PwC, 2021). Moreover, businesses surveyed in the Future of Jobs Report 2020 by the WEF indicate that skills gaps are a major barrier to using technology for improved productivity in many sectors (PwC, 2021; WEF, 2020). [26] However, as identified in

[26] The focus countries in the WEF report (2020) are the United States, the United Kingdom, the United Arab Emirates, China, Germany, India, Saudi Arabia, Poland, the Russian Federation, Japan, France, Thailand, Australia, Brazil, Canada, the Netherlands, Singapore, Spain, Pakistan, Mexico, Switzerland, Argentina, Indonesia, Italy, South Africa and Malaysia.

earlier sections of this paper, a universal or one-size-fits-all approach cannot be applied to the different types of economies in such instances.

Governments, industries and education sectors may, however, benefit the most through comprehensively developing upskilling agendas, particularly with unemployment expected to rise as a result of the pandemic (PwC, 2021). Upskilling, which refers to "the expansion of people's capabilities and employability" in a rapidly changing economy, will aid economic and social inclusion as well as economic recovery following the effects of the COVID-19 pandemic (PwC, 2021). This refers to the assumption that education and skills development have wider social benefits, apart from employment and economic boosts, including collective well-being, trust, human capital development and community building (Kruss, 2004; Holborow, 2012; Vally & Motala, 2014; Ngcwangu, 2014; PwC, 2021).

In its analysis, PwC (2021, p. 8-9; 28-33) recommends the following calls to action for the various role-players involved in instituting skills initiatives such as upskilling toward economic recovery and the adoption of changing trends for a healthy social and economic disposition.

- All stakeholders should build a strong and interconnected ecosystem.
- Government should take an agile approach to drive national skills initiatives, work with key role-players, and make funding for skills initiatives a priority in national recovery plans. The public sector value chain should also be used for its economic, skill-building and inclusion potential.
- Businesses should consider skills and workforce investment as a core business principle, entailing developing a people-centric approach in aligning technology to work and being committed to the skilling of workers.
- Education providers should consider the 'future of work' as a source of reinvention, ensuring vocational and higher education curricula respond to 'just-in-time' labour needs. Education providers should also strive to provide self-directed learning and 'nanodegrees' for lifelong learning.[27]

[27] Nanodegrees are certified online educational programmes that help individuals develop specialised skills in areas related to computer science. They are typically targeted at professionals who want to learn new, advanced skills or develop their current abilities to work with the latest technological developments (Balan, 2021).

Similarly, the WEF (2020) recognises the twin events of COVID-19 and the 4IR as being impactful for the future world of work and skills development. The onset of the pandemic brought unexpected disruptions to labour markets, accelerating the adoption of the 4IR, and thereby deepening pre-existing inequalities across labour markets and reversing the employment gains made since the global recession of 2008/9 (WEF, 2020).

The following findings emerged from the WEF (2020) survey on employers' response to the onset of COVID-19. In addition to labour market displacement, 84% of businesses surveyed indicated that they are accelerating the digitalisation of work processes (use of digital tools, videoconferencing); 83% are applying remote work; and 50% are automating tasks. Meanwhile, 75% of South African businesses indicated that they will speed up task automation; 62.5% are increasingly adopting remote work as well as digitalising work processes (WEF, 2020). These statistics speak to a mostly 'jobless' economic recovery for global business going forward (WEF, 2020).

In terms of upskilling and reskilling towards more digital and automated processes, 42% of global businesses indicated that they will accelerate the digitalisation of upskilling and reskilling; 35% will speed up the implementation of upskilling and reskilling programmes (WEF, 2020). In South Africa, 37.5% indicated the acceleration of organisational transformations; 37.5% indicated that they are accelerating the digitalisation of upskilling and reskilling (WEF, 2020). In comparison, 93% of SA businesses will adopt cloud computing; 93% AI or machine learning; and 87% text, image and voice processing, IoT and connected services, encryption and cyber security, and big data analytics; 86% and 80% will adopt robots or industrial automation, drones, etc., and augmented and virtual reality, respectively (WEF, 2020, p. 105–106).

The statistics for technology adoption by SA businesses are in stark contrast to their plans for cultivating the learning and training interventions needed for workers to adapt to these technologies. Therefore, these insights, at the global and domestic levels, indicate that the persistence of emerging technological trends, along with the lasting effects of the COVID-19 pandemic, will result in an overall reduction in employment and entrench worker displacement

going forward, albeit with unequal geographic and industry patterns in the countries surveyed in the study (WEF, 2020).

WEF (2020) analysis indicates that the humans and machines at work will begin to equalise from about 2025 onward. However, algorithms and machines will primarily focus on tasks of information and data processing, administration, and some elements of traditional manual labour (WEF, 2020). Humans will retain their comparative advantage in managing, advising, decision-making, reasoning, communicating and related interactions (WEF, 2020). More encouragingly, insights show that occupation and skills disruptions, as discussed under section 5.2 of this report, can be counter-balanced by job creation in new fields, known as the 'jobs of tomorrow' (WEF, 2020). In the next ten years, new types of jobs and occupations will be created and/or existing occupations will undergo significant transformations related to their function and skills requirements (WEF, 2020). These opportunities necessitate a skills development approach that will ensure that technological integration does not eclipse human comparative advantage in the labour force.

According to deeper analysis, the jobs of tomorrow present varying opportunities. For instance, workers may have more options to reimagine their professional trajectory with skills that apply to many fields or 'job families', while other professions may remain more strictly bound to their field (WEF, 2020). Other examples include emerging job clusters that have greater diversity insofar as they can be staffed by workers in distinctive fields; the jobs of tomorrow also appear to have the capacity for easier transition between fields (WEF, 2020). These newer types of jobs also present a wider opportunity to pivot into professions with a significant change in skills profile (WEF, 2020). Transitions will be possible between fields where a full skills match may not be required between the source and the destination occupations. For instance, someone from the engineering job family (source) can transition into cloud computing, engineering, people and culture, data and AI, and product development fields or destinations (WEF, 2020, p. 31–34).

WEF (2020) insights offer that such professions can be experimented with by relaxing the entry requirements for some emerging jobs along with providing the appropriate reskilling and upskilling interventions. Employers also foresee that training, or upskilling and reskilling

initiatives, for future jobs will take a more informal approach, with training being done on-the-job—94% of employers indicated this anticipation compared to 65% in 2018 (WEF, 2020, p. 36). Respondents also indicated that workers would require skills interventions, or reskilling, of six months or less (WEF, 2020). Patterns will differ between sectors, with frontline workers requiring less time-intensive skilling while more demanding sectors, such as finance and energy sectors, will require more intensive skilling (WEF, 2020).

Taking stock of the current and emerging jobs and skills trends, the following graph shows the percentage of employers in the global economy indicating their perceived barriers to the adoption of new technologies. While skills gaps and shortages are one of the reasons for the inability of certain job roles to be filled, some factors undermine the demand as well as the appropriate skills interventions to develop needed skills and competencies.

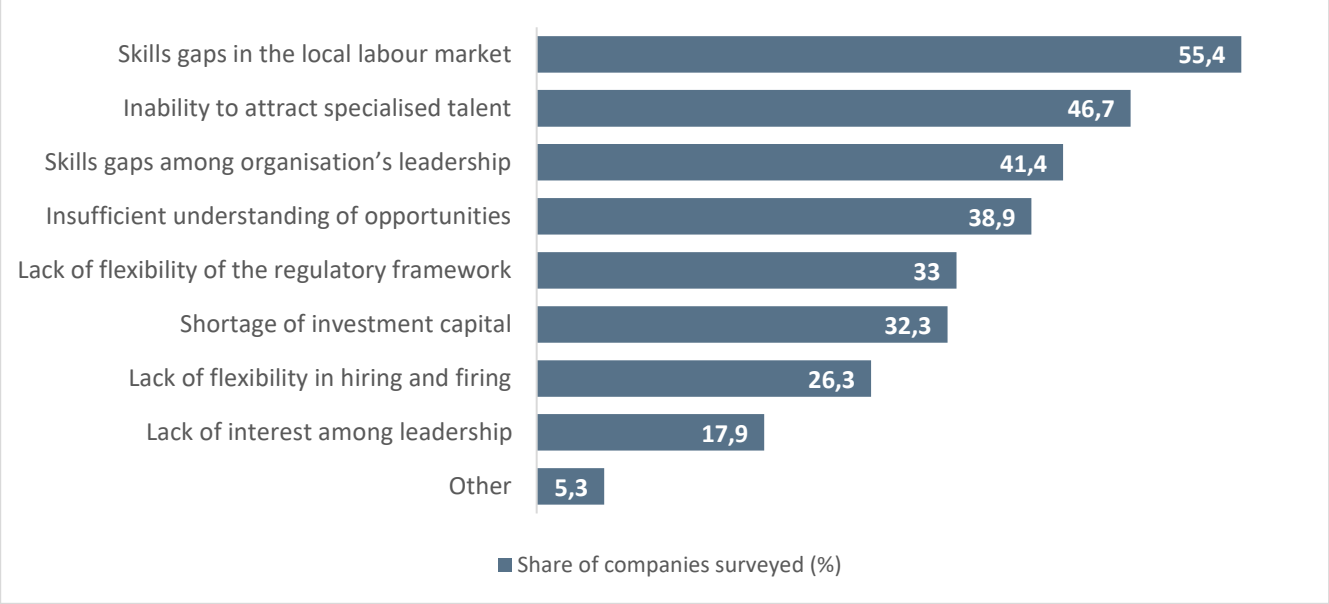


Figure 5: Perceived barriers to adopting new technologies for select global economies *(Future of Jobs Survey 2020, World Economic Forum).*

These challenges, along with emerging needs, can be overcome with coordinated efforts between government and business and other key role-players in the economy.

> "To harness human potential towards greater prosperity and inclusion, leaders will need to shift talent from areas of decline to areas of growth in the economy. They will be called

> on to create effective systems for upgrading individual's skills and capabilities in line with emerging skills demand—in essence, expanding access and delivery of mid-career reskilling and upskilling through private and public sector investment and to ensure that such efforts by workers are rewarded with adequate job opportunities" (WEF, 2020, p. 40).

In ushering in the future world of work, it is imperative that the value of human potential be unlocked in tandem with profitability (WEF, 2020). A 'good jobs strategy' will make work meaningful and purposeful, applying two key strategies: 1) increased company oversight of strategic people metrics, and 2) ensuring that job transitions into emerging roles are effective through well-funded reskilling and upskilling mechanisms (WEF, 2020, p. 46). In line with increased responsibility and accountability by the private sector, governments should pursue holistic approaches to skills development by nurturing active linkages and coordination between the various role-players in the system and the labour market (WEF, 2020, p. 49).

South African businesses surveyed indicated the following responses to shifting skills needs.

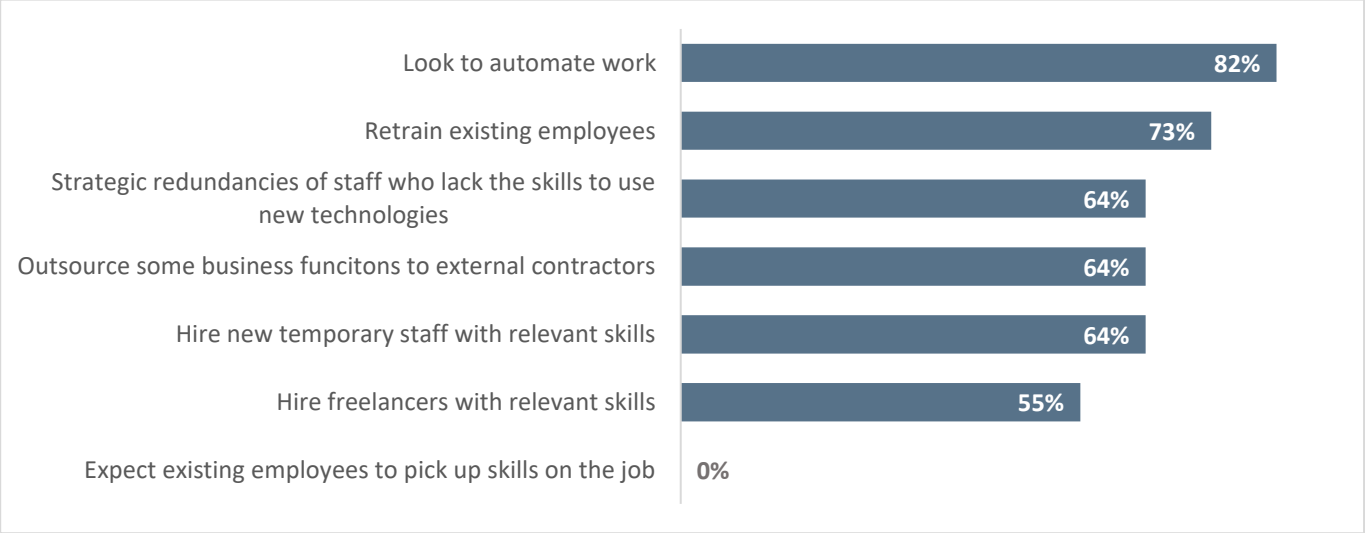


Figure 6: SA Business responses to shifting skills needs, 2020 *(Future of Jobs Survey 2020, World Economic Forum).*

Notably, in terms of retraining existing staff versus outsourcing, or hiring more skilled personnel outside of the company, other countries indicated that they are more likely to retrain their

existing staff per changing skills needs. In Spain, 95% of businesses will retrain staff, 45% will outsource, and 33% will implement strategic redundancies (WEF, 2020). In some of the BRICS countries, 77% of businesses in Russia indicated that they will retrain staff, 83% expect staff to pick up skills on the job, and 43% will implement strategic redundancies.[28] In China, 90% of businesses expect staff to pick up skills, 89% will retrain, and none indicated any strategic redundancies (WEF, 2020). Respondents from Brazil indicated that 93% will retrain staff, 84% expect staff to pick up skills, and none are implementing strategic redundancies; 95% of businesses in India expect staff to pick up skills, 92% will retrain staff, 65% will outsource, and none indicated strategic redundancies (WEF, 2020).

More advanced economies intend to upskill and reskill their staff even further. A notable 98% of respondents from the UK indicated that they will retrain staff, 94% expect existing staff to pick up skills on the job, and none indicated strategic redundancies (WEF, 2020). These figures are closely matched with the US. Finally, 88% of businesses in Switzerland will retrain and expect existing staff to pick up skills; 94% of businesses in Japan expect staff to pick up skills on the job, and 91% will retrain staff; 95% of German businesses expect staff to pick up skills and 85% will re-train their staff (WEF, 2020).

Based on its findings, the WEF (2020) identifies the following key focus areas to address the changing skills needs across economies and industries. Due to the disruption of rapid technology adoption in tandem with the economic crisis of the pandemic, the workforce size and structure *is* changing; job displacement will be faced in many sectors; women, young people and low-wage workers will be deeply impacted; and online learning and training will look different for those in employment versus the unemployed, amongst other variables (WEF, 2020). Therefore, stronger support for upskilling and reskilling is required from both the public and private sectors. The value of human capital investment must be exploited along with technological advancement, and better metrics are needed to measure skills needs in order to close skills gaps and prepare the workforce for future work and employability prospects. Furthermore, government should create investment incentives in support of the jobs and skills of tomorrow (WEF, 2020).

[28] BRICS countries: Brazil, Russia, India, China, and South Africa.

The skills development priorities of South Africa following the pandemic and technological advancement abide by the prescripts of international literature. The National Digital and Future Skills Strategy (DCDT, 2020) presents eight interconnected strategies or initiatives for the South African economy to acclimate to a new era led by a digitalised economy, unprecedented ways of work, learning and training, and jobs and skills requirements. The strategies are cross-cutting and address the need to build digital skills awareness, to undertake research and monitoring on digital skills, to have coordinated actions across government and stakeholders, and, finally, to fund support for digital skills.

The first strategy addresses developing basic and intermediate digital skills from early childhood development (ECD) through to primary and secondary schooling, followed by post-school learning and training (DCDT, 2020). The first strategy will require digital literacy, fluency and competencies at the educator's level that can be carried through to learners, supported by secure and sustainable digital and internet infrastructure (DCDT, 2020). The second strategy addresses building advanced digital skills at the tertiary curriculum level, with capacity-building for lecturing staff and the promotion of research related to the digital skills revolution and economy (DCDT, 2020). Strategies 3 to 5 refer to promoting the effective adoption of digitalisation in the world of work, as well as carrying out research on digital skills and the labour market, addressing the digital divide, and building country-wide digital skills awareness (DCDT, 2020).

Strategy 6 addresses the specific need for ongoing research and monitoring in this area to foster a greater sense of accuracy in the initiatives to advance digital skills in South Africa (DCDT, 2020). The seventh strategy calls for coordination across government, industry, labour and other related stakeholder groups, with particular attention on representative structures for the labour market and skills development, including labour unions and SETAs (DCDT, 2020).

Finally, Strategy 8 stresses the importance of funding resources toward digital skills initiatives, including "materials development (inclusive of open online courses), training delivery, scholarships and bursaries, support for learnerships, support for digital tech start-ups, public awareness building and flagship events" (DCDT, 2020). The Strategy paper will undergo a five-

year comprehensive review and update through the Department of Communications and Digital Technologies; an implementation programme will also be developed and undertaken (DCDT, 2020).

The NPC (2020) offers that taking advantage of the emerging and powerful technologies will require supply-side measures in South Africa to improve affordable and meaningful digital access, while demand-side strategies should increase the absorptive capacity of users, businesses and society to fuel the economy. The focus should not be solely on occupations and skills in demand, but also on economic reconstruction for the whole country. Moreover, the institutional and regulatory bottlenecks and capability challenges in the country must be overcome to enable the equitable application of 4IR technologies in national development (NPC, 2020). Together with improved connectivity, effective regulation, functioning markets, consumer welfare, redressing poor education outcomes and developing a digital skills base, South Africa must achieve an economic growth rate closer to 10% to absorb the 700 000-plus new entrants into the job market every year (NPC, 2020).

Public investment in “independent, local, multidisciplinary digital policy research” must also be undertaken to prepare policymakers in the country for the new era (NPC, 2020). According to recent data, SA spends about 0.8% of GDP on research; in comparison, Brazil spends 1.8%, and none of SA’s spend on research is directed into multidisciplinary digital policy research (NPC, 2020). After the 2020/21 period, it will be critical for countries to understand and foster the conditions for adaptation to new technologies and other trends and to develop the appropriate developmental mechanisms to support this. Research in this domain will also help to manage the “inevitable” impacts of these changes and trends (NPC, 2020).

However, what is evident in the reports and strategy papers that emerged in 2020 and now 2021 is that the twin forces of the pandemic and emerging technologies imply grand-scale changes to labour market dynamics, as well as a dramatic realignment to the skills base of many countries and industries (NPC, 2020; DCDT, 2020; PwC, 2020; WEF, 2020). South Africa’s existing challenges with its skills supply and demand system will be compounded with the greater, fast-paced demands of pandemic-related and technological trends (NPC, 2020; DCDT, 2020; PwC, 2020; WEF, 2020).

Therefore, for SA, in ensuring that education and training provision is in line with local labour market demands and economic development strategies, all role-players—i.e. businesses, government and educational institutions—must be responsive by taking decisions, initiating actions, and engaging in continuous consultation and collaboration (Macphail, 2019; DCDT, 2020). Moreover, implementing innovative and inclusive strategies to invest in skills, job creation, improving labour standards and increasing productivity is essential for the attainment of adequate living standards and decent work in all types of employment (Macphail, 2019; DCDT, 2020; NPC, 2020). The dynamic and disruptive nature of emerging global trends requires “flexible, resilient and agile” solutions toward an innovative and inclusive future (Macphail, 2019). Investing in people’s skills, particularly in developing countries, is one of the best ways to prepare for an unpredictable future (Macphail, 2019).

As posited by the PwC (2021), skills interventions such as upskilling will be transformational in the next ten years, both economically and socially. Skills interventions suited to present-day demands will strive to develop people with the attitudes, aspirations and competency to continually adapt to and participate in the changing world of work (PwC, 2021). Such interventions will also lead to developing the type of transferable skills, extensively referred to in this section, to make people more “versatile, resilient and adaptable”, whether through formal or self-employment (PwC, 2021). The learning mindset required in this new era will have to be entrenched in individuals at a young age, starting in elementary education—more than learning certain skills for a specific type of job or function, skills interventions in the future are about mindset, or ‘state of mind’ (Vally & Motala, 2014; Fajaryati et al., 2020; PwC, 2021).

Skills interventions to support upskilling and reskilling initiatives will also require “the right kind of training programmes” (PwC, 2021, p. 12). For developing economies like South Africa, skills interventions of the future must be complemented with the provision of basic economic and health conditions, as well as access to the internet and ICT infrastructure (NPC, 2020; PwC, 2021).

Insofar as what to expect in the next ten years, Guillén (2020) says,

> "I have conducted research on the outlook ten years down the road over the last few years. […] I worry not only about the future state of business but also about how workers and consumers might be affected by the avalanche of change coming our way. […] The clock is ticking. The year 2030 is not some remote point in the unforeseeable future. It is right around the corner, and we need to prepare ourselves for both the opportunities and the challenges. Simply put, the world as we know it today will be gone by 2030".

Guillén (2020) also states that continuing down the same path even when it is not working is problematic and that massive changes require adaptation in gradual but effective ways, not obstinacy. This applies to the individual, business, the state and the overall global order. Actions taken collectively will impact everyone in the next ten years and well beyond 2030. Susskind (2020) writes that through the centuries, people have suffered bouts of panic over technological innovations and being replaced by machines; however, "time and again" those fears have turned out to be misplaced.

Susskind (2020) is dismissive of "dramatic predictions" and cautions that rationality should be applied to the anticipation that large segments of the workforce are completely replaceable by automation and AI—and argues that some tasks lie beyond the reach of most capable machines. Susskind (2020) also offers that commentators, economists, politicians and policymakers alike all turn to the concept of "more education" when faced with the threat of the future of work, which is, ultimately, a skills challenge. In other words, with the right education and training, the threat of technological unemployment can be overcome. However, Susskind (2020) argues that while this may indeed be our "best response", we still have to ascertain what "more education" means, as

> "The idea that education can *indefinitely* solve the employment problems created by technological progress is pervasive and largely unchallenged."

Susskind (2020) posits that the answer to the problem may lie in the approach taken, which is in "what we teach, how we teach it, and when we teach it". This statement refers to teaching and training people in jobs that can be or will be done by machines; it also refers to education having to shift to a more adaptive style of learning; and finally, it infers that people will move in

and out of education “repeatedly, throughout their lives” due to technological progress (Susskind, 2020). There is another problem that is overlooked in the education and skills discourse, Susskind (2020) argues—there is a limit to education; “for many people, certain skills simply may not be attainable”, which means that even though new work may arrive that requires new or different skills, attaining new skill sets may be out of reach for people, even if they want to work.

Susskind (2020), making an example of stark reality, argues,

> “Even the best existing education systems cannot provide the literacy, numeracy, and problem-solving skills that are required to help the majority of workers compete with today’s machines—nevermind the capabilities of machines in the future.”

Considering the array of perspectives presented in this sub-chapter, as well as the data and findings explored in the preceding sections, this research study now presents the concluding interpretations for skills development and planning in South Africa in the immediate future and in the next five to ten years.

6. Analysis and Conclusion

Based on the findings in the preceding chapters, this chapter provides a concluding analysis of the impact of the COVID-19 pandemic on the skills environment of South Africa in the medium to long term. The analysis in this chapter responds to the key objectives of this research study. The concluding chapter, therefore, addresses how emergent needs will reflect in 1) national skills policy and planning, 2) the national skills planning fourth phase of 2020–2025, and 3) with insights for a projected outlook on skills policy and interventions in the long term. Finally, the chapter finishes with a closing statement on what the study hopes to achieve with its research.

Skills development, in this study, is identified as a catalyst of economic growth in many countries' educational policies and practices, particularly in neoliberal capitalist societies where human capital development is perceived to play a key role in the economic development of these countries. Therefore, when major economic events occur, the structural effects are immediately seen in employment and labour market changes. The COVID-19 pandemic has been one such event, and through the analysis of various data sources in this study, significant shifts are observed in the employment rate of South Africa in 2020, as well as in the labour demand and skills trends that are closely linked to these shifts.

The economy contracted to -7% of GDP growth, and unemployment rose significantly in each quarter of 2020 during the hard lockdown levels of the pandemic. The economic indicators referred to in the study show that unemployment increases are seen across all skill categories in 2020 and 2021, although the increase is steeper for so-called low- or unskilled labour. More vulnerable groups in society and the economy are disproportionately affected, too. The data reveal that unemployment amongst skilled labour eased as the economy stabilised in the less-restricted lockdown levels of 2020.

The pandemic effected change in how people are currently living, working and moving socially. In tandem, society experienced technological and digital advancements at a pace that was not anticipated before 2020, as a result of the onset of the COVID-19 pandemic. The health and safety requirements attached to the containment of the coronavirus saw a wide-scale adoption of survival through methods that many societies (particularly those with developing and less-

developed economies) had never before reckoned with. The study extensively explores what some of these changes were and how they are relevant to its research focus, which includes the world of work, jobs and skills trends.

Across the world, the immediate impact of the twin forces of the pandemic and the advent of advanced technologies signals that the future is swiftly becoming dynamic and disruptive and will require resilience and agile solutions from governments, businesses and other major decision-makers in society.

Most of the literature referenced in the study call for a multidisciplinary approach to solving issues toward economic and social development for many economies in these unprecedented times. Kramer and Kramer (2020, p. 2) observe that “the COVID-19 pandemic presents researchers and practitioners with a massive (unplanned) experiment”, while Leach et al. (2021) note that the pandemic revealed the limits of conventional models of economic growth and that post-pandemic responses should be transformative. Concerning policy responses in South Africa, specifically, Francis et al. (2020) question whether responses will create opportunities for a more “egalitarian” South African society or if inequality will intensify. This question arises from South Africa’s challenges with unemployment and now job displacement as a result of the pandemic (Francis et al., 2020). Francis et al. (2020, p. 353) also argue that traditional economic tools used to address socio-economic challenges are “beyond the bounds” of the impact of the pandemic, and that “new, inclusive bargaining arrangements” are required to bridge the unequal divide in the country.

Concerning skills policy, Rasool (2020a) states that the pandemic has had devastating socio-economic setbacks that require decisive action and change from the skills development system in South Africa. Hattingh (2020) acknowledges that both the 4IR and COVID-19 are forcing a new reality that requires the “examination and restructuring” of the current PSET system in South Africa. The South African PSET system should be “fit-for-purpose” to ensure that the workforce is prepared for the new world of work (Hattingh, 2020). The ERRP and the ERRS, described in sub-section 5.3.1, will be key guiding policies in ensuring the economy adopts a fit-for-purpose approach as it strives to recover from the crisis and build a way forward.

The findings and analysis presented can now be used to determine the implications of the observed trends on skills policy, planning and a future outlook for skills development in the country. Insight is also given into how skills development efforts in South Africa can be used to boost the economy into recovery and a transformed state going forward.

6.1. Impact of the crisis on national skills policy and planning

The onset of the pandemic did not only have economic repercussions for business and labour; it also impacted the activity of various developmental institutions in the country, including that of education and skills development. The pandemic-related measures resulted in school closures across the country, with learners losing a significant number of school days across all grades in the 2020 school year (Berg van der, 2020; Liu et al., 2020; Soudien et al., 2020). School closures resulted in socio-economic and psychological distress for many households and for school-going children dependent on welfare programs offered at school, and curriculums could not be completed, creating gaps in education that will have lasting implications in the future labour market (Berg van der, 2020; Liu et al., 2020; Soudien et al., 2020).

Research also shows that learners return to school with lower achievements as pandemic-related restrictions ease; moreover, the gap between low- and high-achieving learners will grow as a result of extended absences from school (Liu et al., 2020; Soudien et al., 2020). ECD may be impacted by slower rates of achievement in literacy and numeracy, which will require that educators practice variance and differentiation in teaching methods going forward (Liu et al., 2020).

Furthermore, the rift between who has and who does not have access to internet connectivity and technology is immense in South African society; this can be especially difficult for those in their early school-going years (Soudien et al., 2020; Ngware, 2020). In the same way that PSET learners and the workforce had to adopt online learning and work, education at the primary and secondary levels onboarded mass communication and internet-based resources for continued teaching (Ngware, 2020). The abrupt nature of the pandemic and the adoption of digital and online technologies will have lasting ramifications for learners who are now facing hybrid

learning approaches in the future. The impacts will be even harsher on those with limited to no access to interactive and internet-based learning materials and tools (Ngware, 2020).

By extension, the problems created at the primary and secondary levels of schooling and education have knock-on effects on what happens in the post-education system. The findings in this study indicate that higher-level skills, knowledge and competencies will be desired in the labour market in the unfolding future—this creates an impending paradox. If the supply of literacy and curriculum-based competencies may be comprised in the current school-going generation, this same cohort will be the constituents supplied into the labour force ten to 15 years down the line. Two scenarios are likely to occur. There could be a large supply of mostly middle-level competencies supplied into a labour market that is growing increasingly dependent on higher-level skills. In contrast, inequality will be greatly exacerbated in future labour dynamics due to the current digital divide playing out at the school level, i.e. those with access to interactive and internet-based learning today will have a significant advantage over those with limited to no access tomorrow.

In the skills development system, the immediate action taken to alleviate the strain faced by businesses due to the pandemic was for government to enforce a SDL payment holiday of four months as part of its COVID-19 relief schemes (SARS, 2021). As identified in Chapter 4, the SDL keeps the PSET institution operational. Companies pay the tax levy to SARS, who disburses these funds to the DHET, who in turn uses it to capacitate skills development initiatives through various PSET organs. An SDL holiday meant that skills development organs, such as the NSF and SETAs, would have smaller incomes to implement the initiatives planned for the 2020/21 period. The consequences of the SDL relief or payment holiday in 2020 will be seen in skills planning efforts for successive years. This might be reflected in changing skills priorities for SETAs as well as employers. For example, funding priority could be given to the reskilling and upskilling of workers already in the workforce, resulting in a decreased up-take or skilling of entry-level workers.

The long-term impact of the skills development levy payment holiday is anticipated to have positive and negative outcomes. On a positive note, according to Pearson (2020), it might promote online learning and training to the benefit of organisations and regulatory bodies; face-

to-face learning is considered costly for employers. By contrast, the levy deferment and overall business shrinkage in the economy mean that there will be less money or income to spend on learning and training, which is a priority for the economy (Pearson, 2020). Overall cost-cutting in skills development interventions will see an increase in online training, which saves companies travel and time costs but will result in fewer skills development educators and facilitators being used to deliver training (Pearson, 2020).

These points considered, the SETAs, too, will experience reduced incomes due to the levy holiday, and this will invariably impact their skills development efforts, which include research, skills planning and carrying out skills programmes in line with their existing mandate and the ERR Skills Strategy. The effects of the levy payment holiday on skills development for both the supply side and the demand side reflect the importance of the interlinked relationship between state mechanisms and businesses in ensuring the national skills system remains functional and productive (Powell et al., 2016). In addition, the SETAs, from their perspective, indicated that they have had to review and reprioritise their budgets, which would make reaching their performance targets for the 2020/21 period challenging (PMG, 2020).

The overall budget loss from the skills levy relief scheme amounted to R6.1 billion, which results in a R1.2 billion shortfall for the NSF and R4.8 billion for the SETAs (PMG, 2020). The impact of the shortfall in budgets for skills funding institutions would result in fewer learning programmes being carried out and reduced enrolment targets for learning and skills programmes (PMG, 2020). The MICT SETA’s commitment to 4IR solutions involving ten universities across the country faced a loss of R376 million as a result of the levy relief (PMG, 2020). In turn, this loss impacts the number of unemployed learners who can enrol in learnerships under this programme on an annual basis—the total target of enrolments under this programme decreases from 11 845 to 6 196 (PMG, 2020).

Moreover, the internal capacity of the SETAs and the NSF are also impacted by the levy relief. The NSF indicated that they were already facing internal capacity constraints with a high vacancy rate and a need for staff training and, as a result of the budget shortfall, will not be able to recover the revenue loss and will require budget reprioritisation (PMG, 2020).

The goals and mechanisms of the skills development levy are intended to improve access to skills training for unemployed youth and the vulnerable or previously disadvantaged people (Palmer, 2020). Therefore, a lack of funds or income from the SDL for skills development organisations to implement their programmes and reach their targets would result in poorer employment outcomes in the long run if fewer people were receiving the learning and training that make them 'employable'.

The SDL shortfall for skills planning organisations is yet another impact of the pandemic that has long-standing effects that had been unexpected before the onset of the crisis. While the market is anticipated to demand 'more and higher' skills in the next few years, the supply side may be introducing only a limited number of individuals into the South African labour market. This will exacerbate inequalities and intensify existing structural challenges, such as rising unemployment and a growing population of 'side-lined' or discouraged individuals.

The accumulation of the implications highlighted in the study speaks to the need for a proactive rather than reactive approach to policymaking, in general, and particularly for education and skills development.

> "South Africa is often described as having good policy but poor implementation. Policy is not good if it is not appropriate to the institutional endowments or the absorptive capacity of the state, firms and citizens" (NPC, 2020, p. 118).

The NPC (2020, p. 123) proposes that to adequately prepare for and embrace the digital economy, SA should develop a "diverse, adaptive digitally skilled workforce". To develop a broad-based economy with advanced digital skills, the deficit must be addressed at the basic educational level—this will result in a pipeline of future talent through all school levels up to tertiary (NPC, 2020).

Moreover, investments in digital literacy and skills must not be exclusionary but extended to all as the digital revolution will encompass both consumption and production in the future (NPC, 2020). Hattingh (2020) addresses some of the fundamental changes to the national skills development system following the dual impact of COVID-19 and the 4IR. Hattingh (2020)

motivates for formal recognition to be given for learning achievements in the 4IR, including skills that are not linked to credits on the NQF. This aligns with the global perspectives in earlier sections that signal that shorter courses may take precedent to close immediate skills and occupational shortages related to 4IR technologies. Further motivation includes addressing skills gaps in the existing workforce, adapting teaching and learning methods, and rethinking the assumptions ingrained in the current skills system, in particular for the qualifications framework and for occupationally directed programmes to gain more recognition (Hattingh, 2020).

From the supply-side perspective, as per a DHET-commissioned study (Rasool, 2020b, p. 25), the following skills priorities are indicated as most impactful following the events of 2020:

- Skilling of unemployed persons, including the youth and retrenched workers;
- Changing the work and training environments to mitigate the challenges of COVID-19;
- Reprioritising budgets due to revenue declines;
- Changing learning delivery modalities to online, distance and blended learning;
- Supporting SMME development through skills training; and
- Refocusing in-company training priorities.

The Department of Communications and Digital Technologies (DCDT, 2020) highlights the need for skills in line with digitalisation to find foundations in basic and intermediate school levels (primary and secondary school), and also in TVET institutions and technology hubs as centres of learning. There are many institutions and organisations considered to be instrumental for affecting future national skills policy and planning, as well as implementation, in accordance with the changing world of work, learning and skills, and the 4IR. The DBE, the DHET, universities or so-called higher education institutions, TVET colleges, incubators and technology hubs can be involved with developing and promoting digital skills (DCDT, 2020).

Aligned with policy, strategy and research imperatives are the Department of Science and Innovation (DSI) and the Council for Scientific and Industrial Research (CSIR) (DCDT, 2020; NPC, 2020). Similarly, cross-governmental coordination toward industrial relations, un(employment) or capacity building is associated with the Department of Employment and

Labour (DoEL), the Department of Trade, Industry and Competition (dtic) and the Department of Public Service and Administration (DPSA).

The involvement of labour market representatives and skills development representatives—such as the SETAs, the NSA, the South African Qualifications Authority (SAQA), the Quality Council for Trades and Occupations (QCTO), the NSF, and the Human Resource Development Council of South Africa (HRDCSA)—will be for advice, research, policies, strategies, skills planning services, qualifications, funding and the implementation of skills development initiatives in digital and related skills (DCDT, 2020).

The aforementioned representatives are not an exhaustive list of all the entities and role-players who have a stake in ensuring South Africa can be successful in adopting and adapting to a digital economy and other pandemic-induced economic changes (DCDT, 2020). Academia, science institutions, professional bodies and civil society organisations, organised business and labour are indispensable and can be actively involved in this historic, transformative period in the economy (DCDT, 2020).

6.2. Implications on the national skills planning fourth phase (2020–2025)

As identified in the preceding sub-section, skills development agencies are impacted financially by the COVID-19 relief schemes instituted by the government to protect business and jobs. The reduced budgets of skills development organisations will, in turn, affect the extent of the respective organisations' skills interventions. The knock-on effects of reduced programmes and programme targets will appear in the labour market around 2024/25 as fewer people are entering and leaving the current learning and training pipeline. As the findings in this study show, the demand for specific skills and new skills is anticipated to increase around the same time. This will likely create a problem in the supply and demand dynamics in the labour market in the medium term (i.e. the next five years).

Moreover, the economic downturn of the country will continue to discourage businesses from participating in skills development and/or funding initiatives as the focus remains on business survival and continuity. Participation from the demand side of the labour market will not greatly

impact the number of learning and training programmes carried out by training and higher education institutions. However, the active participation from organisations will inform the skills research and planning needed for upcoming years. It will be imperative for SETAs and other funding organisations to direct skills spend into critical channels. The SETAs should also shift their focus from achieving “targets” set by the DHET to achieving the outcomes and “real impact” of funding initiatives and interventions (Palmer, 2020). Some of the more necessary outcomes include increasing the implementation of directed, critical and strategic programmes of learnerships, apprenticeships, skills programmes and projects, and also establishing beneficial and strategic partnerships (Palmer, 2020).

Other implications for short- to medium-term skills planning in the country will be that more rigorous impact assessments, above and beyond tracer studies, will be carried out (Palmer, 2020). The significance of research in skills planning cannot be overstated. Stronger monitoring and evaluation from within SETAs will also become vital as employers will be expected to know the impact of their contributions (Palmer, 2020). Moreover, the unemployment rate among SETA-trained learners (about 57%) is likely an indication of a misalignment between the curriculum offered and the skills needed in the workplace (Palmer, 2020). Increased and improved collaboration and consultation between industry and skills planning organisations will be required, too—otherwise, the labour market will face the risk of industry advancing while the supply side is left behind and misaligned (Palmer, 2020; NPC, 2020).

Advancements in 4IR technologies will see the greatest immediate impact in the construction, logistics, financial, manufacturing, mining, agriculture and aerospace sectors (NPC, 2020). The continued misalignment between skills supply and demand in the labour market must be challenged and corrected within the next few years to enable these industries to be competitive in the global market (NPC, 2020). If changing needs are not addressed in skills development initiatives and interventions, the country will face the risk of producing an oversupply of skills that are not aligned with the demand (NPC, 2020). This will also negate the objectives of the ERR Skills Strategy, which is designed to increase the responsiveness of the PSET system in the short term following the COVID-19 crisis.

The digital divide must also be addressed with urgency. With the rapid adoption of new technologies in key economic sectors, skills alignment cannot be achieved if a significant proportion of the population does not have access to internet connectivity and IT infrastructure (NPC, 2020). Deficits associated with digital skills require immediate attention, too (NPC, 2020). These skills range from basic literacy to high-level engineering and advanced coding; traditional skill sets in economics, politics and sociology adapted to a digital environment are also required (NPC, 2020).

Moreover, the curriculums offered at all school levels, through to the higher education level, must be updated to meet future skills requirements, while training at the PSET level must be fast-tracked to meet the shortage of supply of skills that will come up in the short to medium term (NPC, 2020). In line with addressing immediate skills shortages as a result of the pandemic, adequate research on the impact of COVID-19 must be conducted to avoid the risk of addressing “misleading signals” for public investment in skills development (Rasool, 2020a).

In addition, SA’s current focus on highly skilled personnel may result in less manual labour, which is needed in the manufacturing sector and will remain a need despite the adoption of automation and AI in such industries (NPC, 2020). The aforementioned point aligns with the global insights presented in this research where it is highlighted that human labour will be complemented by more automated processes and intelligent machines. There will be a need for upskilling to accommodate such processes, but entire jobs or workforces will not be eliminated overnight or in the near future.

That said, the potential benefits of advanced technologies will not be realised in the immediate future—at least not for developing economies. However, it is anticipated that these technologies could boost the development of the economy through improvements in production and manufacturing (NPC, 2020). In the long term, the industrial sectors should be in a position to benefit from the strengths of the trends associated with the 4IR. Such benefits will be achieved through strides made in skills development, enabling infrastructure, and research and development innovation (NPC, 2020). According to the NPC, the national skills planning system should:

- Develop a crosscutting digital policy that enables a high level of integrated planning implementation to harness the benefits of 4IR and to mitigate the risks;
- Deepen public-private partnerships to align skills and create jobs;
- Adopt well-developed data protection and rights frameworks;
- Strengthen the sectors that can benefit from 4IR, including manufacturing and agriculture;
- Address the lack of digital skills and also basic education, which needs to be adapted to new and relevant ways of learning;
- Expand power and broadband infrastructure, making it stable and affordable; and
- Support the commercialisation of local innovations.

These recommendations will not only promote job creation and employment, particularly where strategic sectors are boosted to gain from emerging trends, but it will also inspire innovation and creativity in South African society. As noted throughout the study, these skills are considered instrumental in future economic behaviour.

The NPC (2020) notes that with the necessary support, the 4IR can be used to boost leadership and entrepreneurship in segments of society. With the requisite skills, citizens can participate in the country's development of a digital economy (NPC, 2020). The NPC (2020) also commends the Department of Science and Innovation/Technology (DSI) for its efforts in innovation, forward planning and implementation, as well as its approach to integrated national research. The DST's research is in the form of white papers on R&D, innovation and ICT, roadmaps for technology, and so forth, and this is instrumental for development, recovery and response following the pandemic and for the future world of work, learning and training (NPC, 2020).

Implications for the National Skills Development Plan (NSDP) 2030

The NSDP 2030 (DHET, 2017b) encompasses the objectives of the NDP and the White Paper on PSET, with an overarching aim to increase the provision of quality education and skills development to all South Africans, particularly in rural areas. The NSDP 2030 (DHET, 2017b) speaks to the developmental objectives of government, including economic growth,

employment creation and social development, which are extensively addressed in various sections in this study.

One of the goals of the NSDP 2030 (DHET, 2017b) is to encapsulate the framework for a continuously integrated PSET system, which involves strengthening the role and extending the lifespan of the 21 SETAs, whose role is instrumental in the immediate actions or responses from the supply side of the labour market at present. An important mission of NSDP 2030 (DHET, 2017b) is to improve access to occupations in high demand or that are considered priority occupations.

The relevance, and perhaps significance, of the NSDP 2030 will be realised in the years to come as new occupations are anticipated as a result of COVID-19 and the 4IR. However, as indicated earlier, the OIHD lists are reviewed and updated every two years, and the urgency of emerging trends versus skills shortages requires timely responsiveness for the skills system. It is for this reason that the researcher decided to not assess the implications for the NSDP 2030 as a result of the COVID-19 crisis. The implications that may arise from such an assessment may be more relevant closer to the end of the ten-year period when the plan can be measured against the outcomes of what will unfold in the next few years.

Beyond this, in one of a series of webinars hosted by the NSA on the pandemic's impact on education, skills development and training, it was noted by a panellist that the crisis meant that the NSDP 2030 must be "scrapped" and that a new plan must be established in its place (M&G, 2020). It was further suggested that a shorter more flexible plan be developed and that existing skills plans ought to be "simplified" (M&G, 2020).

6.3. Outlook on skills development interventions and policy in the next 5 to 10 years

Based on the findings, analysis and interpretation of the events of the pandemic, this concluding sub-section highlights the direction that is likely to be followed in learning and skills development for South Africa in the long term. In the period following the medium term, or following 2025, the economic fluctuations sparked by the pandemic will begin to stabilise. We will likely see the real economic impact on employment, i.e. the job losses that could not be

restored as well as the growth in employment for jobs that are sustainable in the changing economy and digital environment.

The policy direction and skills interventions that will unfold in the country, based on the researcher's findings, should be realised through a pipeline of future talent that is adequately educated and adapted for the demands of emerging technologies and disruptive economic environments.

The future workforce of the country must be educated and trained in digital skills at the primary and secondary schooling levels so that they can learn more advanced methods and technologies once they enter the post-school environment or workforce. This generation of workers must also be equipped with skills that make them agile and adaptable not only to uncertain conditions but also to take on different roles in different fields.

The current workforce, similarly, must be reskilled and upskilled. They must also adopt adaptive ways of thinking as we enter the future world of work. Most importantly, for SA, businesses must be agile and flexible in how they approach emerging demands. Will they outsource and disregard their existing personnel who are not adapted to change? Or will they choose to upskill their existing staff with the requisite skills in line with the priority intervention of government, which is to sustain and grow employment (particularly in line with the objectives of the ERR Plan and Skills Strategy)?

To capacitate businesses along this path, public investments must be made to reduce the barriers to online learning and training for all South Africans in the next ten years. Large-scale internet connectivity and digital infrastructure must be implemented across the country to bridge not only existing spatial and other socio-economic disparities but also to ensure that the digital divide does not intensify inequalities beyond repair. This is especially critical for those in the schooling system. Without the requisite tools and access to learning in the current environment, many will be left behind and, in the years to come, a dearth of human and skills capacity will materialise in the supply dynamics of the labour market.

The need to strengthen digital and technology education in the country also opens an opportunity to restructure the education and skills system for inclusivity and equitability. Addressing inequality should remain a major priority in policy, while developing more standardised curriculums through alternative, cost-effective learning delivery methods could ensure that learners enjoy more equal opportunities once they reach the post-school level.

On-the-job training and short courses have been identified as the ideal approach for workplace training going forward. The research also signifies that lifelong learning will become a fixture in the future due to the rapid evolution of trends and technologies.

The research findings further stress the importance of early childhood development and achievement. Curriculums may have to be adapted for learners who were affected by fewer school days as a result of the pandemic. The loss in developing fundamental learning capabilities such as literacy, comprehension and numeracy will have enduring effects on these learners' learning careers.

Considering the above, the capacity of institutional and funding organs must be developed in the medium to long term. The achievements of national skills development efforts will directly correlate with the outputs, efficacy and efficiency of key role-players and implementers in the skills development system.

Research toward skills development and policy must be continuous. The economic crisis of the pandemic revealed that labour market dynamics are as unpredictable as changes in the market and economy. More concise and efficient skills policies should be developed going forward. An investment in research into future and anticipated skills and developmental needs could serve as an alternative to lengthy policy instruments.

Finally, it should be borne in mind that the value of human capital development must not be lost in the excitement of technological innovation. The research shows that AI, automation and other intelligent machinery are not a substitute for the inherent capabilities of the human individual. The qualities of leadership, creativity and emotional intelligence cannot be replicated by 4IR technologies.

Above all, education and skills policy following the pandemic, and in the dawn of the 4IR, must be realistic. It must be feasible in terms of what the supply side can produce into the labour market and within the timeframes of what is actually possible, not based on desired visions. At the same time, policy should consider that educators on the supply side must also undergo training and skilling in line with emerging trends in order to transfer current education and skills at the appropriate levels to those in the skills pipeline.

At a more systemic level, policy must be cognisant of South Africa's historical legacy and unique structural qualities, including its shortcomings and failures of redress and transformation. The inequality entrenched in the country will intensify and will put to question the progress the democratic government has made to date. Not just at a macro-economic level, but also socially and at a community level, many will be left wanting and questioning. The time is ripe for South African developmental policy to reckon with the unemployed and discouraged individuals in its society. This is a substantial socio-economic failure that is grossly overlooked in policy and could surge when met with the full impact of the digital divide. Many more people may become marginalised and discouraged as the world and small segments of South African society advance without them.

The strength in skills development policy and response will be found in a forward-looking approach that champions progress and action. A continued focus on challenges and constraints would represent a failure for the skills system and fail the dependants of this very system, too. Although the problems and challenges are evident to most people, the response and resolutions are not. People's fears should be appeased by effective leadership in the skills arena. Dialogue should be kept to a minimum and supplemented with an action-oriented strategy. The time to act on the changing skills needs of the economy is now, not in five or ten years. Those at the helm of skills planning and development cannot wait to see how the labour market plays out. The key actors in South Africa's skills system must anticipate the needs and changes of the labour market based on information at hand, as well as what the current trends signal. If we wait until 2025–2030 to 'review' and 'adjust' the skills development plans of 2015–2020, it will be too late, as the challenges of today will be entrenched by then.

6.4. Conclusion

This research study on the economic impact of the COVID-19 pandemic on jobs, skills and skills development in South Africa brought to light many issues that exist in the country's skills system. Some of the issues are historical; some are structurally entrenched and challenging for South Africa to overcome; others are a result of poor policy implementation. The study also reveals a compelling trait of South Africa's challenge with unemployment and the issue of skills shortages. It is the fact that the challenges the country faces with persistent unemployment are not in isolation— and, perhaps, not solely attributable to gross skills alignment challenges— and that 'skills' alone will not bring the 'jobs' to the millions of people in the country striving to be economic participants.

The onset of the twin events of 2020, COVID-19 and the rapid advancement of the 4IR, should thus inspire a renewed sense of urgency in South Africa's skills development plans and policy. Policymakers and decision-makers should consider, too, that job security and employment have always been evasive for many in the country. The pandemic-related events should produce a proactive, forward-looking and resolutions-based response that will not incite fear, or worse yet, further despondency and discouragement among citizens.

With everything considered, the insights provided throughout this research report are timely and can be interpreted further for policymaking and decision-making by various role-players in the South African PSET system. There are many opportunities that cannot be missed, and many challenges that cannot be overlooked. The leaders in skills development in the country should take care to respond swiftly before these wide-scale trends begin to gain momentum without us on board and create another insurmountable developmental challenge.

> "The world as we know it is about to change, and it won't be returning anytime soon, if ever. The rules are changing—forever."
>
> - Guillén, 2020.

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