

**The contribution of Technical Vocational Education and Training
formal programmes to inclusive company growth and
transformation: A case study of the automotive manufacturing
sector in South Africa**

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DECLARATION

I, Anthony Tolika Sibiya, undersigned, declare that *The contribution of Technical Vocational Education and Training Formal Programmes to inclusive company growth and transformation: A case study of the automotive manufacturing sector in South Africa* is my work, except where indicated, and that it has not been submitted before for any degree or examination at any institution of higher learning both locally and abroad. It is submitted in fulfilment of the requirements of the degree of Doctor of Philosophy at the University of the Witwatersrand, Johannesburg.

Signed:



Anthony Tolika Sibiya

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ACRONYMS AND ABBREVIATIONS

AC	Automotive Council
AIEC	Automotive Industry Export Council
APDP	Automotive Production Development Programme
ASC	Automotive Skills Council
ASCCI	Automotive Supply Chain Competitiveness Initiative
ASDC	Automotive Skills Development Council
Auto	Automotive Sector
BRICS	Brazil, Russia, India, China, and South Africa
CBU	Completely Built-Up
CSR	Corporate Social Responsibility
DHET	Department of Higher Education and Training
DTI	Department of Trade and Industry
FRIDGE	Fund for Research Industrial Development, Growth, and Equity
GDP	Gross Domestic Product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HEIs	Higher education institutions
HSRC	Human Social Research Council
ILO	International Labour Organization
IPAP	Industrial Policy Action Plan
MIBC	Metal Industry Bargaining Council
MerSETA	Manufacturing, Engineering and Related Services Sector Education and Training Authority (merSETA)
MIDP	Motor Industry Development Programme
MISA	Motor Industry Staff Association
MNCs	Multi-National Corporations
NAFTA	North America Free Trade Area
NAACAM	National Association of Automotive Component and Allied Manufacturers

NAAMSA	National Association of Automobile Manufacturers of South Africa
NCV	National Certificate Vocational
NDP	National Development Plan
NEDLAC	National Economic Development and Labour Council
NQF	National Qualifications Framework
NRF	National Research Fund
NSF	National Skills Fund
NSDS	National Skills Development Strategy
NUMSA	National Union of Metalworkers of South Africa
OECD	Organisation for Economic Co-operation and Development
OEMs	Original Equipment Manufacturers
OICA	Organisation Internationale des Constructeurs' Automobiles'
(PC4IR)	Presidential Commission on the Fourth Industrial Revolution
PLC	Programmable Logic Controller
PSET	Post-Schooling Education and Training
R&D	Research and Development
RMI	Retail Motor Industry
SA	South Africa
SAAM	South African Automotive Masterplan
SAYC	South African Youth Council
SETA	Sector Education and Training Authority
Stats SA	Statistics South Africa
SSP	Sector Skills Plan
TIPS	Trade Industry and Industrial Policy Strategies
TVET	Technical Vocational Education and Training
UK	United Kingdom
VSD	Vocational Skills Development
WB	World Bank

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ABSTRACT

This thesis investigates the contribution of formal Technical Vocational Education and Training (TVET) programmes to inclusive industrial growth and transformation in the automotive manufacturing sector in South Africa. The thesis argues, based on the survey and case studies, that the role skills play is an addition role, not central one, in industrial growth. Industrial growth is rather driven by other contextual factors, namely, exposure to domestic and export markets, increase in clients, healthy relations in the workplace, and changes in technology and industrial policy. It is through these factors that skills play a role. Similarly, industrial transformation is not driven by skills, but rather by factors such as the clients' product demands and specifications; the national industrial/sectoral policy; research and innovation expertise from company headquarters often outside South Africa; global market forces and price volatility; new regulations on emission(s) demanded by the government; and competition amongst components. Thus as a contribution to existing literature, I argue that there is a need to consider and recognize company level factors that are critical in shaping the skills system if we are to understand the extent to which skills enhance growth and transformation. Moreover, the findings challenge the current formal TVET provision policy in South African which does not seem to recognize or incorporate other forms of provision in which skills can be acquired, i.e., informal- on the job training, non-formal company based training, in addition to formal institutional based training.

KEY WORDS: TVET SKILLS; INCLUSIVITY; COMANPY GRWOTH; TRANSFORMATION; INDUSTRIAL POLICY; FORMAL, INFORMAL AND NON-FORMAL SKILLS TRAINING

CHAPTER ONE: INTRODUCTION OF THE RESEARCH STUDY

1.1 CHAPTER OVERVIEW

This research investigates the contribution of formal technical vocational education and training (TVET) programmes to inclusive company growth and transformation in the automotive manufacturing sector in South Africa. I chose the automotive manufacturing sector as the case study because of its importance in the country's economy in terms of Gross Domestic Product (GDP) contribution, employment creation, sales, and exports (Meyer, 2016). The automotive sector has been the focus of considerable national industrial policy and targeted government support incentives post-1994 democratic breakthrough (Barnes & Black, 2013; Lamprecht, 2009; Masondo, 2018).

Given the important role of industrialization in economic development, policymakers, particularly in middle-income countries who wish to develop and expand their economies, see the role of TVET programmes to company-level growth and transformation as important. The South East Asian countries like Japan in the 1950s, South Korea in 1960, and China in the 1980s, are amongst the countries who seem to have pursued industrialization to address the high levels of unemployment, poverty, and inequality (Gumede, 2008, 2009, 2011; Mkandawire, 2001). The South East Asian economies seem to exemplify patterns of success with far-reaching experience of industrialization and structural changes, especially for the low and middle-income countries around the world (Gumede, 2009; Mathebula, 2016; Turok et al., 2018).

Samouel and Aram (2016) argue that a well-trained and qualified workforce with requisite technical skills is more adept to withstand workplace pressures. Moreover, research in the human capital tradition links education with individual productivity.

Vocational education programmes have gained prominence and unprecedented traction in middle-income countries, becoming a priority for government and donors. I have undertaken this research to understand how and to what extent formal TVET programmes contribute to inclusive company-level growth and transformation, given the prioritization of vocational training not only in South Africa but the world over.

Gender inclusivity is critical to understand the extent to which women have been considered at the point of hiring, especially when companies are growing, and how skills bridge the gap in the workplace. Moreover, there seems to be acknowledgement in the literature that addressing the gendered nature of employment in the South African workplace over and above the automotive industry is the fundamental thrust of the economic transformation restructuring. Illustrating the economic transformation argument, the former Minister of Trade and Industry, Davies (2018) accedes that employees in the auto sector must broadly be representative of the democratic profile of society in terms of race and gender. To address the structural fault-lines in the South African economy is to eliminate systematically the race-centred economic ownership and control of the companies in the sector; and to introduce effective tools to curb unemployment, poverty, and inequality, which are additional barriers to the growth of women employment (Davies, 2018; Department of Trade and Industry, 2018). I particularly focused on formal pre-employment and in-employment programmes held by five categories of employees, namely, operators and general workers, which I categorized as mid-level employees; and artisans/technicians, supervisors and higher management, which I categorized as higher-skilled employees. This is to test if there is a relationship between skills and company growth and transformation in the automotive industry.

Additionally, I wished to determine whether training programmes focusing on high skills are more significant than others and which specific programmes are seen as most relevant by companies.

1.2 DEFINITION OF CONCEPTS IN THE STUDY

These concepts below are utilized throughout this research well to mean the following:

Growth: In this research I am not using the term economic growth, which is about an increase in products produced over a period, often measured in terms of income increase, or adjusted inflation GDP per capita. I am specifically interested in company level growth, which refers to changes in employment, salaries, and sales and export. This definition of company growth is also consistent in how literature describes it in the context of the automotive sector (Meyer, 2016).

Inclusivity: refers to the changes in the workplace in terms of gender, working conditions, and or employee wellness. The gender parity in employment is crucial to understand the extent to which women have been considered at the point of hiring especially when companies are growing, improved working conditions for workers, and wellness. I use the concept of inclusivity to measure the extent to which company growth has improved wellness and working conditions, how it benefited women and historically disadvantaged persons.

The term **transformation** is not used in its broadest sense in terms of fundamental changes in the economy in relation to ownership and control. It is used in the study to refer to workplace changes in terms of technology, work organization, and product change.

Automotive manufacturing: The focus is mainly on the manufacturing companies both the original equipment manufacturers (OEMs), and component supplier manufacturers in the automotive sector.

1.3 CONTEXTUAL BACKGROUND OF THE STUDY

My research is located in a multi-country skills research project underway in six countries with contrasting economic development features namely, Bangladesh, Cambodia, Ethiopia, Laos Vietnam, and South Africa. This research project seeks to examine the critical factors that support or impede the role that the vocational skills development (VSD) programmes play in inclusive industrial growth and transformation in at least two manufacturing sectors per country. The South African component of the project focuses on three manufacturing sectors: automotive, clothing and textiles, and food and beverages, because these three sectors are crucial in the country's economy and prioritized by the South African government through national industrial policies and other support programmes and incentives. The focus of my research is the automotive manufacturing industry.

The industry is one of the important sectors in the South African economy in terms of employment, GDP contribution and exports (Meyer, 2016). It has been steadily growing and contributed about 6.4% of the overall GDP in 2019; it creates numerous jobs, and plays an important role in the export market in terms of sales thus facilitate a positive presence in the global economy (Automotive Industry Export Council, 2019). The automotive industry has also been the focus of considerable national industrial policy and targeted government interventions post the 1994 democratic breakthrough (Automotive Industry Export Council, 2020; Barnes et al., 2018; Black et al., 2018; Mashilo, 2019; Masondo, 2018). The emergence of the Coronavirus in early 2020 has negatively affected broader industry's contribution to the GDP, which stood at 4.9%, with manufacturing standing at 2.8% and retail having 2.1%, which is a decrease as a result of lockdown restrictions imposed by President Cyril Ramaphosa (NAAMSA, 2020). However, my research was conducted prior to the COVID-19 pandemic, when the industry's performance was stronger.

1.4 INDUSTRIALIZATION AND ECONOMIC GROWTH

South Africa is categorized as a middle-income country, although still unequal in global standards, with very high levels of unemployment, poverty and inequality (Statistics South Africa, 2020). Thus, growing the economy through an economic reconstruction and recovery plan is an important priority for South Africa to address these socio-economic issues, which have been worsened by the coronavirus pandemic (hereafter COVID-19).

An extensive body of literature on developmental economics suggests that central to economic growth is industrialization which is seen as a catalyst for job creation, boosting economic growth, and thereby reducing socio-economic challenges (Budlender, 1999; Hauge & Chang, 2019; Kniivila, 2007; Marichen & Ignatius, 2015; Maurer et al., 2017; Mkandawire, 2001; Samouel & Aram, 2016; Woolard, 2002; Zalk, 2014b). Although industrialization is often criticized for the destruction of nature in terms of air pollution, water shortages, and land and solid waste pollution (Li, Li, and Zhang, 2018), it nonetheless continues to be crucial for economic growth. Dong, Wang, Su, Hua, and Zhang (2019) for instance support the notion of industrialization for economic development; however, they assert that it is also a determinant of the variation in the environmental quality as the economy expands. In the context of South Africa, the industrialization process has been dominated throughout history by the mining industry (Chabane et al., 2006; Fine & Rustomjee, 1996). The discovery of gold and diamonds in the 19th century led the industrialization process in South Africa, thus is argued to have been mining dominated, also referred to as mineral and energy complex (Bell & Farrell, 1997; Takala, 2008).

As explained above, industrialization is broadly perceived as crucial to addressing the prevalent socio-economic challenges that are still persistent post the democratic transition of 27 years (Budlender, 1999; Green, 2009; Marichen & Ignatius, 2015; Zalk, 2014b). Although the political breakthrough of 1994 allowed significant changes in the workplace and access to skills as part

of the democratization project, the legacy of apartheid persists (Ngcwangu, 2014). Furthermore, trade and liberalization which came as a result of democracy, and acceptance of the country to the global value chain, led to tariffs reduction, and has had a huge impact on the country's ability to industrialize, despite many attempts by the government to do so through industrial programmes (Guyer, 1998).

Notwithstanding the challenges, Zalk (2014a) suggests that industrial strategies are important for the South African economy to enhance industrial growth on a large scale. This argument of industrialization-led growth that South Africa must undertake is also supported by the international literature on developmental political economy, which shows that even the highly advanced economies in the world have undertaken industrialization on a large scale (Cheon, 2014; Hauge & Chang, 2019; Johnson, 1982; Kniivila, 2007; Wade, 1990).

Effective development and deployment of skills in the context of industrialization appear to be an important ingredient, in addition to industrial policy (Laseinde & Kanakana, 2017). The International Labour Organization (2021) asserts that skills have changed the lives of young people for the better in countries like Bangladesh and Haiti. Laseinde and Kanakana (2017) argue that skills are essential in the context of industrial development because they are linked to employment and the growth sustainability of the industry. They argue that the role of skills is important to guarantee the sustainability of the growth of the automotive industry both locally and internationally.

Thus, restructuring education and training systems is a policy priority in many countries around the world. In this context, rethinking the relationship between supply and demand is crucial to understand the extent to which skills play a role in the economy.

A focus on skills has been important in industrial policy in the South African automotive sector, particularly the Automotive Production Development Programme (APDP). The Automotive Production Development Programme is the production incentive scheme for the motor industry, aimed at promoting production volumes in the specified motor vehicle industry, and promoting added value in the automotive component industry, thus creating employment across the automotive value chain. It came into effect in 2013 replacing the Motor Industry Development Programme (MIDP).

The latest industrial policy framework, the South African Automotive Masterplan 2020-2035 (SAAM) which is referred to as APDP part 2, also places importance on skills development to achieve growth and sustain global competition (Barnes et al., 2018). These policies are discussed in more detail in Chapter 2; for now the important point is that skills have been seen as important to improve growth in the form of productivity and competitiveness, halve unemployment, and improve wages.

1.5 RESEARCH PROBLEM

Industrialization is seen as crucial for economic growth and thereby reducing unemployment, poverty, and inequality. The automotive sector remains essential to South Africa's industrialization, and has been growing and supported through national industrial policy. Economic development theories as well as national policies have emphasized the critical role that skills play in driving industrialization for both social and economic development, in particular in developing countries (Guadagno, 2012; International Labour Organization, 2021; King, 2013; Lall, 2013; Laseinde & Kanakana, 2017; Maurer, 2011; Maurer et al., 2011).

Vocational skills programmes have gained prominence and unprecedented traction, becoming an apex priority for governments in developing countries (Afeti, 2018; Baatjes et al., 2014; Wedekind, 2014; King, 2013). As a result, the

donor funding towards vocational skills appears to have also expanded over the years to support industry-based skills, in particular, export-oriented manufacturing (King, 2013; Lall, 2013; Maurer et al., 2017). King (2013) argues that developing vocational skills has become an important priority to address socio-economic issues on one hand, and industry skills on the other hand, especially export-oriented manufacturing sectors. However, there seems to be a gap in the literature on how these skills programmes help companies to grow or even transform, besides being critical to addressing employment challenges.

In South Africa, TVET programmes have been identified as a catalyst to address unemployment amongst the youth, poverty, and inequality (Department of Higher Education and Training, 2012, 2014, 2014; Kgobe & Baatjes, 2014), and have gained prominence in government policy, plans, and public debate (Baatjes et al., 2014). Wedekind (2014) argues that there is hardly a day without a government official or political figure speaking about a necessity to strengthen the education system, without mentioning the importance of skills and vocational education and training. But there is insufficient insight into the role that skills are actually playing in the transformation and growth of industrial sectors. In most instances, impact evaluation literature that focus on skills training programmes look at how education and skills benefit individuals in terms of employment and income, with little analysis of how these skills programmes help companies to drive economic growth and their inclusive transformation (Maurer et al., 2011, 2017).

My study therefore investigates the contribution of formal TVET programmes to growth and transformation at a company level in South Africa, situated in the automotive sector, and the interaction between skills on the one hand, and transformation and growth on the other.

1.6 RESEARCH AIMS AND OBJECTIVES

In this research, I explore the role that Technical Vocational Education and Training programmes play in inclusive company-level growth and transformation in the automotive sector in South Africa. The focus is on formal skills programmes held pre-employment as well as those acquired in employment in the five years from 2014 to 2019.

For the survey process, I have considered five categories of employees: operators, general workers, artisans/technicians, supervisors and higher management employees, with the aim of exploring the relationship between formal training programmes and company-level growth and transformation. In the interviews, I focused on mid-skilled employees (MSEs) and high skilled employees (HSEs), both of which are critical in the production line and maintenance. The aim for the case studies was to determine whether formal training programmes focusing on high skills are more significant than others and which specific skills programmes are seen as most relevant by companies.

1.7 RESEARCH QUESTIONS

What are companies' perceptions of the contribution of formal Vocational Education and Training programmes to industrial transformation and inclusive growth?

Research sub-questions:

1. To what extent do formal TVET programmes contribute to company growth and transformation?
2. Are Technical Vocational Education and Training programmes that focus on higher skill levels more likely to contribute to inclusive company growth and transformation?
3. Do formal pre- and in-employment training programmes help companies regarding skills needs?

4. What are the underlying factors that shape or influence skills contribution to company growth and transformation?

1.8 RESEARCH RATIONALE

The rationale for this study lies primarily in the fact that vocational skills programmes have gained noticeable prominence and have become a priority for governments in developing countries (Afeti, 2018; Baatjes et al., 2014; Wedekind, 2014; King, 2013). Consequently, the international agencies for donor funding towards vocational skills appears to have also expanded over the years to support industry-based skills, in particular, export-oriented manufacturing (King, 2013; Lall, 2013; Maurer et al., 2017).

The expansion of vocational skills programmes is premised on the fact that skills play an important role to address socio-economic issues on one hand, and industry skills on the other hand, especially export-oriented manufacturing sectors (King, 2013). Moreover, skills appear to play a crucial role in driving industrialization for both social and economic development, in particular in developing countries (Guadagno, 2012; International Labour Organization, 2021; King, 2013; Lall, 2013; Laseinde & Kanakana, 2017; Maurer, 2011; Maurer et al., 2011). In the context of South Africa, Ngcwangu (2016) argues that there has been policy changes, legislations enacted and institutions being established to drive skills training for the population for workplace purposes. However, much less is known about how skills actually contribute to inclusive growth and transformation of industrial sectors.

The existing impact evaluation literature that often focuses on skills training programmes look at how education and skills benefit individuals in terms of employment and income, with little analysis of how these skills programmes help companies to expand and introduce workplace changes in technology and product (Maurer et al., 2011, 2017). This research sought to understand companies' perceptions of the contribution of formal Vocational Education

and Training programmes to industrial transformation and inclusive growth. It attempts to close a gap in the literature on the extent to which skills play a role at a company level in growth and transformation. Furthermore, it generates new insights on the extent to which skills help companies to inclusively grow and transform, and identify the contextual factors that are perceived play an for skills regime at a company level. In addition, to gain insight into the formal TVET programmes, which are the most valued by companies, which could be useful for consideration by educational institutions such as Technical and Vocational Education and Training Colleges. It argues that the role these formal TVET programmes play at various occupational levels in the company, and how they are utilized, has policy implications on whether to shift focus on the higher, or lower TVET programmes that companies perceive as necessary and relevant t for their growth and transformation.

1.9 SIGNIFICANCE OF THE RESEARCH

The research contributes to the debates around the relationship between skills and company growth and transformation, which is critical in the realm of skills, knowledge, and work discourse, in South Africa and elsewhere. Understanding the role of skills at a company level is crucial in the context of the demand and supply notion, for skills to play a role in the economy. As a component of a broader project, the study also contributes to building international comparative insights into education policy/ skills policy and industrial strategy as well. Understanding the extent to which skills contribute to growth and transformation, and factors that shape skills contribution to company growth, are quite crucial in shaping policy framework in South Africa.

1.10 OVERVIEW AND OUTLINE OF CHAPTERS

In Chapter 1, I have introduced the study, explaining that the focus of the research is to understand the relationship between skills and inclusive company growth and transformation in the automotive sector in South Africa.

I explained that this is important because of the automotive sector's contribution to the South African economy, and that industrialization is widely argued to be crucial for economic development. Further, skills development is seen as important for industrialization and development, but there is insufficient research into the role of skills in contributing to company level development and growth.

In Chapter 2, I review the literature on the South African automotive industry and its contribution to overall economic performance in South Africa. The literature shows that industrial policy has been central to the revival and growth of the sector. It further shows that despite the steady progress, the industry was not spared by COVID-19, which negatively affected the demand and supply.

Chapter 3 reviews the literature on skills for the manufacturing sector. The literature shows that the relationship between education and economy is complex, and my research confirms the complexity and argues that to understand the relationship between education, knowledge, and work there are crucial factors that play an influential role that should be considered as they shape skills formation system at a company and sector level. It argues that contextual factors - social, economic, political, and cultural - are significant for skills to contribute to the work organization in the production and economy at large. The research confirms these factors and is much more specific about how they relate at a broader level.

In Chapter 4, I explain my methodological design for data collection and analysis. I have created these key concepts into a relationship with each other to understand the extent to which they contribute to industrial growth and transformation. In Chapter 5, I analyze the survey results which indicate that skills are crucial for companies, but are not the sufficient conditions for growth and transformation.

In Chapter 6, I present an analysis of the dominant forms of training emerging from the 11 company case studies. The chapter shows that although formal training is important for employment, vocational training takes place in-house and is mainly non-formal. This informal on-the-job training, learnership and apprenticeship programmes, and induction training are seen as more valuable in terms of addressing company-specific skills needs. The chapter shows variations in how companies perceive TVET programmes, with the majority of component suppliers perceiving it to be poor and weak in terms of quality they need.

Chapter 7 shows that transformation at a company level is not driven by skills but by the national industrial policy, the clients' product demands and specifications, price volatility, and global market dynamics as well as competition. It is through these factors – particularly technology and industrial policy – that skills play a role. In Chapter 8, I show that company growth (which has been inclusive in terms of gender as companies have employed women at mid-skilled level and high skilled level) has also not been driven by skills but by technology, customer product demands and specifications, national industrial policy, competition, work organization – all of which shape skills contributions.

In Chapter 9, a conclusion chapter, I reflect on the literature in relation to findings. The literature review showed how industrial policy has supported industrial transformation and growth. It is encouraging that representatives from all companies discussed confirmed that recent national industrial policies have encouraged and supported skills training. Recent industrial policy supports training, as well as supporting companies to change technology, increase employment, and sales and exports. My study was not testing the implementation or success of industrial policy per se. Nonetheless, it offers some insights into this issue, as representatives of all companies spoke about its crucial role in supporting their survival or growth. Given the policy encourages

and supports companies to introduce and adopt new technology to remain internationally competitive, and given that I have established that skills are seen as important once technology has been introduced, I can infer an indirect relationship between skills and industrial policy in the automotive sector.

The literature reviewed also showed that new technological changes have rather led to reskilling and upskilling in the workplace. It is encouraging that senior management in all companies and the majority of trade unions representatives discussed confirmed that change in technology led to upskilling and reskilling rather than application of section 189 (retrenchment), although three trade union representatives had different views from the rest. Given that changes in technology drives upskilling and reskilling of workers, and more component suppliers also require solid formal qualification even for supervisors, I can infer an indirect relationship between skills and changes in technology and work organization in the automotive sector. In terms of inclusivity in the automotive sector, there is a shift towards inclusivity in the sector, both in terms of hiring more Black African workers in skilled positions and in terms of women making inroads into the sector. I could not find evidence that skills were driving this shift. It seems from my study that inclusivity is primarily driven by employment equity legislation; it also seemed as if companies recognize the social imperative for inclusivity and there seems to be a consensus between senior management and trade union representatives that women's participation especially at a higher level is still not at a desirable level.

More broadly, the literature showed that skills is complex. Skills are acquired in different ways and skills vary even within companies with similar economic indicators. It's interesting that all companies discussed confirmed that beyond formal qualifications which contribute to skills needs to a certain degree, there are other, different types of training, most of which are non-formal and company-based seen as crucial for skills needs i.e., induction training, informal

on-the-job training, formal dual training for MSE and HSE, and secondary schooling certificate.

CHAPTER TWO: CONTEXT: THE ROLE OF AUTOMOTIVE INDUSTRY IN THE SOUTH AFRICAN ECONOMY

2.1 CHAPTER OVERVIEW

In this chapter, I discuss the role of the automotive manufacturing sector in the South African economy. To do this, the chapter is divided into six sections. The first section reflects on the control and ownership patterns in the industry, arguing that before the political breakthrough foreign control was quite minimal, and in some instances, there was a mixture of ownership in the 1990s with the majority of firms owned locally. However, post-1994 this picture completely changed, and the literature seems to attribute this to the integration of the South African economy and rapid increase in exports which is seen to have paved the way for foreign dominance and control. While others argue that the industrial policy has facilitated foreign dominance in the industry, thus the majority of companies are foreign-owned. Second section reflects on the industry performance in the country's economy showing that significant structural changes have taken place in the industry post-1994. The section argues that the national industrial policy, the Motor Industry Development Programme (MIDP) established in 1995, laid the foundation and contributed to the stable growth of industry both in the domestic and global markets. This is so in terms of employment increase (although it is still male-dominated), and sales and exports, all seen as crucial to achieve economies of scale and maintain global competitiveness. In the third section, I discuss the different industry stakeholders, namely NAAMSA, NAACAM, and trade unions for their strategic role in the overall direction of the industry and the economy as a whole. I show in this section that there is relative degree of coordination between employers' associations and unions in the automotive sector in South Africa. In section four I reflect on technological changes in the sector, showing that automation is the future in the sector and is central to the sector's growth, sustainability, and stability to compete at a global level. There seems to be a

consensus in the policy reports, government documents, and the literature that technological changes in the industry require a new set of skills. My research was conducted prior to the COVID-19 pandemic. I therefore only very briefly reflect on the negative impact of the pandemic on industry performance.

2.2 THE ROLE OF AUTOMOTIVE IN SOUTH AFRICAN ECONOMY

The automotive sector is important in the South African economy, accounting for 6.8% of Gross Domestic Product growth in 2018 (Davies & Vincent, 2020; Davies, 2018; Deloitte, 2019). When looking at the overall picture in manufacturing broadly, the GDP share stood at 11.8% in the same period, and the industry contributed a significant share of the entire manufacturing capacity (Automotive Industry Export Council, 2018, 2019, 2020). Since 1995 with the establishment of the MIDP, the first national industrial policy in the sector post-1994, there has been a steady growth in terms of exports and sales and employment (Meyer, 2016). This growth and performance of the industry were acknowledged by President Zuma in his state of the nation address when outlining the initiatives meant to boost and incentivize the automotive industry, which at the time had attracted five billion rand of investments over the previous five years (The Presidency, 2016). This is in stark contrast with the broader manufacturing sector in South Africa. Black, Craig, and Dunne (2018) argue that the performance of the manufacturing sector compared to other countries has been poor since the early 1990s.

The Department of Trade and Industry (2018) also acknowledges that the manufacturing sector is extremely poor by global comparison, especially when compared to the East Asia and Pacific region as well as other middle-income countries. It has been under severe strain as its gross domestic product has declined over time to about 13.2% in the last three years compared to almost 25% in the 80s. Despite the poor performance of the manufacturing sector as a whole, there is consensus in the literature that significant structural changes have taken place in the automotive industry post-1994 and the MIDP is seen to

have contributed immensely in this regard (Barnes & Kaplinsky, 2000; Black, 2009; Fund for Research Industrial Development, Growth and Equity, 2005; HSRC Automotive Industry, 2008; Lamprecht, 2009; Mashilo, 2010).

The structural changes have had significant impact with backward and forward linkages within the primary, secondary, and tertiary sectors that stimulate economic spinoffs and multiplier effects on the local economy (Numsa, 2016). The labour union, NUMSA, which plays an important role in the manufacturing industries in South Africa acknowledges the industry's significance in the South African economy, particularly the Original Equipment Manufacturers (OEMs), in terms of employment creation and compensation, government revenue, exports, and capital investments (Numsa, 2016). This reflects the power of combining good industrial policy and foreign investment as necessary ingredients in ensuring greater economic growth (Gastrow, 2012).

The first industrial policy, introduced in 1995, was the Motor Industry Development Programme (MIDP), which is acknowledged for having revised and stabilised the automotive manufacturing sector in South Africa (Automotive Industry Export Council, 2014 2017, 2018, 2019, 2020; Lamprecht, 2009). Black (2009) argues that the MIDP was established to reduce the tariffs to 40%, especially for light and commercial vehicles; and reduce by 30% the tariffs for components and parts by 2002. Barnes & Black (2013) argue that the light cars manufacturers for the local market were entitled to a duty-free allowance, and components to the figure of 27% of the wholesale price of the car could be imported duty-free. The MIDP is acknowledged for having gradually phased off tariffs leading to more exports incentives to improve the local industry's global standard in terms of competitiveness and affordability in the domestic market that also stabilized employment (Department of Trade and Industry, 2007a, 2007b, 2009; Mashilo, 2010; The Department of Trade and Industry, 2007a, 2007b, 2012).

As a result, the domestic production of vehicle models has been significantly rationalized to achieve increasing economies-of-scale benefits in the domestic and export markets (Barnes & Black, 2013). The mandate of the MIDP was to drive export development, lower production costs, enable wide access to both domestic and international markets by ensuring that South Africa becomes the export base, and also increase investment (Barnes & Black, 2013; Barnes & Kaplinsky, 2000; Black, 2001, 2011; Black & Mitchell, 2002; Fund for Research Industrial Development, Growth and Equity, 2005; HSRC Automotive Industry, 2008; Masondo, 2018). This did not only improve employment growth but the GDP also increased from 5.7% in 2002 to 6.4% a year later (NAAMSA, 2004).

The industry has been steadily growing since then and is regarded as the backbone of the South African economy with regards to employment, economic development, GDP contribution, sales, and exports (Automotive Industry Export Council, 2014, 2017, 2018; Meyer, 2016; The Presidency, 2016). It is seen to have established itself to be fully equipped and capable to compete globally and this is attributed to the industrial policy adopted in 1995 (Meyer, 2016).

The Automotive Production Development Programme (APDP) is the second industrial policy, replacing the MIDP and having the aim to increase production volumes in the motor vehicle (Automotive Industry Export Council, 2014; Barnes et al., 2018; Masondo, 2018). NAACAM (2019b) indicates that the APDP was introduced to create a conducive environment that enables registered OEMs and component suppliers to significantly increase production volumes, and thereby create employment across the automotive value chain. Despite APDP efforts to grow production volume, the industry is still regarded as a global tier 2 as it still produces below the target of one million vehicles per annum (Barnes et al., 2018).

The newly adopted South African Automotive Masterplan (SAAM) for 2020-2035, the APDP part 2, is the third policy framework geared towards improving the domestic industry's global standards in terms of competitiveness and stimulate production to reach at least 1% vehicle production of global output by 2035 (Barnes et al., 2018).

The SAAM has set itself a target to yearly produce 1.4 million cars at an aspirational 60% local content by 2035, accompanied by improving productivity. This alone should increase employment and contribute to the country's economic trajectory. The long-term mission of the automotive master plan is to drive automotive growth, upgrade the technological base, and improve competitiveness all of which are centred on job creation (Trade and Industrial Policy Strategies, 2019).

2.2.1 Control and Ownership Patterns

This section reflects on the control and ownership patterns in the industry, arguing that before the political breakthrough foreign control was quite minimal, and in some instances, there was a mixture of ownership in the 1990s with the majority of firms owned locally (Barnes, 2013; Ngcwangu, 2016). However, post-1994 this picture completely changed, and the literature suggests that the integration of the South African economy and rapid increase in exports have paved the way for foreign dominance and control; and also the industrial policy is seen to have facilitated foreign dominance in the industry, thus the majority of companies are foreign-owned (Barnes, 2013, 2013; Fund for Research Industrial Development, Growth and Equity, 2005; HSRC Automotive Industry, 2008; Lamprecht, 2009; Mashilo, 2010, 2010, 2019; Masondo, 2018; Ngcwangu, 2016). The foreign ownership patterns and control of the automotive manufacturing sector especially around the mid-1990s before the 1994 democratic dispensation were quite minimal in the assembly plant manufacturers and components suppliers (Barnes, 2013; Lamprecht, 2009). (Barnes, 2013; Ngcwangu, 2016) argue that there was a mixture of

ownership in the 1990s with the majority of firms owned locally. Lamprecht (2009) agrees that there was very little foreign presence in the auto industry in the early 1990s apart from the direct German equity in two original equipment manufacturers (OEMs).

The original equipment manufacturers except BMW and Volkswagen were to a greater extent owned by the South African companies albeit functioning under the franchise agreements with parent companies (Masondo, 2018; Ngcwangu, 2016). Since the existence of the automotive industry in South Africa in the 1920s, the two German vehicle manufacturers were the only two companies who continued to operate as wholly controlled subsidiaries, whilst the rest of OEMs were owned locally and encouraged partnership with components manufacturers (Barnes, 2013; Lamprecht, 2009; Mashilo, 2019; Ngcwangu, 2016). However, the integration of the South African economy to the global economy, especially after sanctions ended, led to the rapid increase in the export market which paved foreign control and dominance (Black, 2011).

The Motor Industry Development Programme as the new industrial policy framework could be argued to have facilitated the dominance of international companies in the sector post-1994 as most if not all vehicle manufacturers have become fully integrated into the global network established by their foreign parent companies (Lamprecht, 2009). Black (2009) argues that presently, all OEMs are exclusively under the control and ownership of the multinational companies, with headquarters outside South Africa. The fundamental shift towards foreign ownership commenced around 1995, which was the same year the MIDP was established. Barnes (2013) argues that it was to be expected given the limited size of the domestic market, and the Automotive Production Development Programme (APDP) introduced in 2013 is unlikely to shift ownership trajectory. He does, however, acknowledge that ownership drastically changed in the late 1990s, thus Original Equipment

Manufacturers (OEMs) are now Multi-National Corporations, and leading major part components firms were foreign-owned around 2010. This foreign ownership extends to component supplier firms with mainly major components firms that have employees over 500 also under foreign control.

There is another perspective, which suggests that the changes with regards to ownership and control were driven by economies of scale pressures, pricing, the technology advances, which re-organized production capacity, that enhanced the Multi-National Corporations' control of the domestic auto industry (Barnes & Kaplinsky, 2000; Barnes, 2013; Black, 2011). Domestic firms had to adapt to the changing competitive outlook and forge alliances at an international level (Barnes, 2013).

This trajectory suggests that investment decisions and compliance to quality standards are now determined out of South Africa as the country in which these subsidiaries are operating. Masondo (2018) argues that the major operation of the domestic auto companies which are subsidiaries is to manufacture and assemble automobile products, whilst research and development, design, and decisions on new and latest technology are implemented outside South Africa by countries of companies' origin. The foreign control gives the company wider options to locate their production in different parts of the world based on low costs related to production and access to markets (Barnes, 2013; Masondo, 2018). Masondo argues no efforts were made by the ANC government to at least control the decision on investments of the different OEMs, except only using the 1995 industrial policy programme (the MIDP) to incentives these companies to produce for exports under mutual agreements which still expected the state to support it to compete globally. As result, Masondo (2018) argues companies can on their own fundraise and mobilize financial resources outside the country with no recourse to the country's state. For him, the democratic government had somehow dropped the ball by not exerting necessary pressure and discipline

on the OEMs to increase investments and reduce car models to achieve economies of scale. Thus, He doesn't see the industrial policy as a successful policy in part because it enabled the OEMs to import components on duty free at the same time subsidizing transportation costs to markets that are located far from South Africa. For him, the auto investment between 1996 and 2010 could be associated with the interest to capture the local market and at the same time maximize export gains with the industrial policy. Mashilo (2019:23) argues that access opened by the MIDP led to OEMs which are foreign-owned to put pressure on company level upgrading as a pre-condition in awarding components manufacturing contracts, investments in their local subsidiaries, which entail allocation of new models and production volumes. Barnes (2013) concurs that importers had gained access to the local market in line with the MIDP, hence placing a new set of demands on South African subsidiaries.

2.2.2 Employment Outlook in the Sector

This sub-section argues that the automotive industry is crucial because of employment capabilities in the country's economy. Since the adoption of the first industrial policy, MIDP, the industry has consistently created employment over the last decades especially in the period between 1995 and 2005 (Barnes, 1998, 2000; HSRC Automotive Industry, 2008; Lamprecht, 2009; Meyer, 2016). This was also confirmed by the empirical research conducted by the Fund for Research Industrial Development, Growth, and Equity (2005) that the automotive companies had increased employment figures from 1995 to 2004. Although more employment was recorded between 2001-2004 as opposed to job losses, this varies by company size and type (Barnes, 1998, 2000; Barnes & Kaplinsky, 2000; Fund for Research Industrial Development, Growth and Equity, 2005; HSRC Automotive Industry, 2008; Lamprecht, 2009; NAAMSA, 2004). The employment levels in the industry, which are normally monitored by employer associations supplemented by the research of independent bodies, remained relatively stable between 1995 and 2008 (Lamprecht, 2009). Essential to the steady growth of employment is the resilience of the industry, growth, and

investment ventures which are seen as crucial to sustaining an employment trajectory (Claassen, 2014; Lamprecht, 2009; NAAMSA, 2012).

In 2018 the industry had employed about 110 000 people across the vehicle and component manufacturing sectors, producing over half a million vehicles (Davies & Vincent, 2020; Davies, 2018; Deloitte, 2019, 2020). Furthermore, the quarterly report by the employer association (NAAMSA) showed aggregate employment growth by 187 new jobs in the vehicle manufacturers in December 2019 (NAAMSA, 2019a). Statistics South Africa (2018a) revealed that the industry had about 270 440 people employed, the majority of whom were in retail sales of automotive fuel (32.4%), and retail sales of motor vehicles (29.9%). Furthermore, the employment in maintenance and repair of vehicles and sales of new motor car parts was also substantial. In addition, the local procurement is expected to increase in the next five years. This growth will be accompanied by 16 000 new employment opportunities mainly in the component manufacturing sector with local content growing by 5%, which is what the South African Automotive Masterplan (SAAM) is driving (Motor News Reporter, 2019). While the industry has been growing in terms of employment, it has been male-dominated, with women continuing to be underrepresented in the sector. The sub-section below discusses the employment gender disparities in the sector.

2.2.2. Gender Employment Patterns in the sector

Gender parity in employment is crucial to understand the extent to which women have been considered at the point of hiring especially when companies are growing. The employment growth over the years in the sector seems to have not been gender inclusive, as males in the motor trade stood at 72% and females standing at 28% (Statistics South Africa, 2018). The skewed representation of women in senior positions remains unacceptable in the sector, cutting across sectors (Department of Trade and Industry, 2018). As a consequence, the Motor Industry Staff Association (MISA) has been calling for

an acceleration of gender equality in the industry (Wheels24, 2019). Supporting the gender equality call in the auto industry was Jeanne Esterhuizen, the President of the Retail Motor Industry (hereafter, RMI), who agreed with the Motor Industry Staff Association (MISA) that there was much still to be done to turn the tide, considering the given glaring disparities in remuneration, conditions of service, skills development, and economic access (Wheels24, 2019). To this end, the RMI and many organizations in the sector continue to call for all automotive and component companies to train, reskill, upskill, and promote women from the lower level to the managerial and executive level (Wheels24, 2019). Essentially, there has to be a collaborative approach at a broader level especially between social partners at NEDLAC and a wide civil society to address gender disparities in the workplace (Department of Trade and Industry, 2018).

2.2.3 Export and Sales Market

The global financial meltdown of 2008 was destructive in many economies including the South African one. It resulted in a decline in global demand for many of the domestic commodities which affected negatively the exports and investment in South Africa (Department of Trade and Industry, 2018). Component suppliers were severely affected by the declining OEM sales in general and particularly, the production of catalytic converter sales in South Africa (Gastrow, 2012; Statistics South Africa, 2018). Furthermore, several component suppliers had to reduce their capacity as cost-cutting measures, and that negatively affected the lower tiers of the supply chain (Gastrow, 2012). However, the South African automotive industry regained its strength post-financial crisis, enjoying rapid growth in terms of sales and exports (Automotive Industry Export Council, 2014).

The Automotive Industry Export Council (2014) has attributed the industry export increase to the performance and direction of international markets. For the sector to be competitive in the international arena, it needs to achieve a

certain volume of production, which at the present moment the country's local demand does not meet. The industry is well-positioned in terms of export markets in the Eurozone and North America Free Trade Area (NAFTA), and this remains crucial in terms of technology and knowledge exchange, and transfer (Automotive Industry Export Council, 2019). Similarly, in the recent past, the African region and Asia have also become important for the domestic industry products as both of these economies have expanded and trade relations with the South African economies have strengthened in a profound way (Automotive Industry Export Council, 2019, 2020).

The expansion to the African continent and sub-regions signals an opportune moment for the domestic economy, in which its value-add exports are small and highly commodity-intensive (Department of Trade and Industry, 2018). In 2018 the automotive industry exported products at 14% of the export basket (Motor News Reporter, 2019). Deloitte (2019) indicates that the automotive export has increased and is valued at 180bn, consisting of 14.3% of South African exports. There seems to be a convergence in the industry literature that for the last three decades (1990-2020) the industry continues to be crucial to the country's economy in terms of the export market (Automotive Industry Export Council, 2014, 2014, 2017, 2018, 2019, 2020).

2.2.4. Skills and Industrial Policy in the sector

While extensive literature recounts the industrial policy as a strategic driver of export sales and employment (Department of Trade and Industry, 2007a, 2007b, 2018; Fund for Research Industrial Development, Growth and Equity, 2005; Lamprecht, 2009; Mashilo, 2010), Laseinde and Kanakana (2017) argue that skills have been essential for the Automotive Production Development Programme (hereafter APDP) to sustain the industrial development of South African automotive manufacturing both locally and internationally. For them, the APDP was more emphatic on the necessity to prioritize skills programmes that capacitate employees because human capacity is the greatest

intangible asset, moreover that the skills needed in the industry are linked to employment composition. Similarly, the newly adopted South African Automotive Masterplan 2020-2035 (SAAM) also places the importance of skills development at the centre of growth to sustain global competition. In this regard, Barnes et al (2018) argue that the future of the industry is crucial to ensure skills obstacles do not impede growth and development, thus, the SAAM skills requirements have to be consistent with modern technology as is the case globally (Barnes et al, 2018). However, Laseinde and Kanakana (2017) seem to agree that the skills developed in the context of stiff competition and modern technology globally play an important role. For them, the role of skills in the industry is much more than maintaining global competition and sustaining growth. They argue that skills enhance the strength of the industry in meeting global compliance demands for satisfactory production.

The Industrial Policy Action Plan of 2010/11 shows that the country's skills system is weak as it doesn't sufficiently address the needs of the industry. In this regard, the literature argues that there is the need for skills and industrial policies to be aligned to priority sectors and vice versa (Department of Trade and Industry, 2011).

2.3 KEY STAKEHOLDERS IN THE SECTOR

In this section I discuss different stakeholders namely, NAAMSA, NAACAM, and trade unions, and the role in the overall direction of the industry and the economy as a whole. I commence the section with Naamsa, followed by Naacam and finally Numsa to show that there is relative degree of coordination between employers' associations and unions.

2.3.1 National Association of Automobile Manufacturers of South Africa.

The industry is used as a benchmark by other economic sectors for its good organizational structure, constructive engagement, and collaboration amongst relevant stakeholders. As a consequence, the Department of Trade

and Industry is executing the master plans in a few sectors inspired by the South African Automotive Masterplan 2020-2035 (Barnes et al., 2018; The Presidency, 2020). The industry is recognized and respected globally as an important partner that contributes to international competitiveness and the transformed industry through its contribution to sustaining the existence and development of the automotive industry in South Africa (Deloitte, 2020; NAAMSA, 2019b).

NAAMSA looks after and promotes the interest of all OEMs, as well as major companies that operate in the distribution and importation of new vehicles in the country (Deloitte, 2020; NAAMSA, 2019b). It encourages its companies to drive skills training programmes that are not only beneficial to companies but society at large. As a result, all seven OEMs have spent billions of rand on various training programmes including in-house training.

For example, Volkswagen South Africa (VWSA) has initiatives like R86m Black supplier development fund; Toyota has a R42m empowerment trust; and Ford and Nissan have incubation programmes (Davies & Vincent, 2020; Deloitte, 2020; NAAMSA, 2019b). Furthermore, President Cyril Ramaphosa and NAAMSA have recently announced the Automotive Industry Transformation Fund of 6 Billion rands to further leverage industry funding to provide necessary training and drive skills development in the auto sector (NAAMSA, 2019b).

NAAMSA releases quarterly reports on the latest development in the sector in terms of sales, employment, consumer trends, export performance, and fiscal data figures, which are crucial for the economic measure in the country's economy (Barnes et al., 2018; NAAMSA, 2019a). In its first quarterly reports in 2020 for instance, Naamsa indicated that like any sector, the industry has been severely strained by the Coronavirus (COVID-19) (NAAMSA, 2020). Despite the COVID-19 disruptions, NAAMSA continues to play an important role in the sector in collaborations with other stakeholders. It continues to coordinate the industry activities of its member companies.

Its vision is to facilitate progressive changes in the domestic auto industry and associated industries to promote the country as a significant player of products of international standard for global markets (Automotive Industry Export Council, 2014, 2017, 2018, 2019, 2020; Deloitte, 2020; Modiba, 2020; NAAMSA, 2004, 2012, 2012, 2019a, 2019b, 2020). The association works collectively with other partners and NAACAM (to be discussed below) in monitoring COVID-19 related developments in South Africa and globally. It monitors production-related constraints to inform the markets at large on the material changes (NAAMSA, 2020).

2.3.2 National Association of Automotive Component and Allied Manufacturers.

The National Association of Automotive Component and Allied Manufacturers (NAACAM) is one of the critical voices of the country's automotive component suppliers, both locally and abroad. It is a company-controlled and driven association that champions industry leadership, representation in policy discussions to promote the component suppliers, and engages with a variety of stakeholders, businesses, government, and unions for the betterment of the component manufacturers.

The membership of NAACAM provides components service to OEMs for manufacturing and assembling of cars, as well as Original Equipment export markets both locally and internationally (Automotive Industry Export Council, 2020; Davies & Vincent, 2020; Deloitte, 2020; Modiba, 2020; NAACAM, 2019a; NAAMSA, 2020). Most of the suppliers to OEMs are multi-national companies, effectively globally controlled and owned, though there is an emphasis on growing the local participants in the supply space through localization programmes and transformation, which is driven by the NAACAM (Barnes et al., 2018; Deloitte, 2020; Modiba, 2020; NAACAM, 2019b).

NAACAM engages in wage and industrial relations negotiations in the component sector; builds and maintains relations with strategic decision-

makers in the assembly sector i.e., NAAMSA (NAACAM, 2019a). It is central in the implementation of localization and transformation of the domestic industry as expressed in the recently adopted SAAM (Barnes et al., 2018; NAACAM, 2019b). It also releases data on key trends on issues relating to the components, builds a network, does marketing, and profiles its members. It engages in policy, regulatory, and other strategic industry topics. Like other companies, the associations acknowledge the economy is reeling from the ruins of COVID-19, which have slowed the pace in growth.

NAACAM (2020) attributes the slowdown in economic activity to travel embargos and quarantine measures that have led to shutdowns of plants in major industrial hubs, affecting the components supply in terms of costly logistics as a result of delays in the global supply of the components. The ruins of coronavirus among both component suppliers and car manufacturers reflect the destruction the pandemic has had on the sector, especially on manufacturing in South Africa.

2.3.3 The dominant trade Union—National Union of Metal Workers of SA

The National Union of Metal Workers of South Africa (NUMSA) is the dominant union in the industry. The union was established after merging with four different unions, namely, Metal and Allied Workers Union, Motor Industry Combined Workers Union, National Automobile and Allied Workers Union, and United Metal, Mining, and Allied Workers of South Africa in 1987 during the state of emergence (Bird, 2020; Forrest, 2011; Hlatshwayo, 2013; Saliem, 2015). Motor Industry Combined Workers Union and National Automobile and Allied Workers Union, came together in the mid-1980s to explore ways of working together in organizing work as they had overlapping interests in the vehicle industry with no platform available to address these disputes (Forrest, 2011). The overarching vision was the establishment of single industrial union which will forge worker unity and control. Bird (2020) argues that Numsa therefore became the centre of the South African manufacturing sector. Numsa became a truly a giant union

by South African standards, and with its membership of 261 901 at the time place it as the second biggest affiliate of Congress of South African Trade union (COSATU) in 1987 (Bird, 2020; Forrest, 2011; Hlatshwayo, 2013; Ngcwangu, 2016; Saliem, 2015).

Its dominance in the metal industry was a result of various, and combined experiences and traditions of its merged unions, outplaying the other older racial unions in the Metal Industry Bargaining Council (Forrest, 2011; Hlatshwayo, 2013; Ngcwangu, 2016; Saliem, 2015).

In the early 90s, it introduced a new approach to South African bargaining agreements of concluding agreements with a life span of three years instead of the usual one year (Numsa, 2016). This afforded the industry breathing space to focus on implementing programmes aimed at improving the competitiveness of the industry during intervening years (Numsa, 2016).

Numsa also played a significant role in the fight against the apartheid system in South Africa, not only involving itself in the worker struggles but also contributing to building a civic movement. While it played a role in the political breakthrough of 1994 which ushered the democratic government under the ANC, it was not prepared for economic liberalization and its negative effects on workers, which took place in the form of retrenchments and outsourcing (Hlatshwayo, 2013). Thus, it had to learn more sophisticated strategies to respond to political, organizational, and economic outlooks post-1994 (Saliem, 2015). It has since transformed itself from the phase of representing semi-skilled and unskilled migrant workers to now having an urban-based, formally educated, skilled and semi-skilled worker-base and thus, perceived as an intellectual and radical union, increasingly so since its formation to date (Hlatshwayo, 2013). Despite workplace changes in the workplace in terms of technology, product and work organization to enhance production and maximise profit, the labour movement has continuously consolidated and expanded its membership. Between the 1990s to 2016, the labour movement

has grown from around 260 000 to 338 000 members in the context of the economy that has shed jobs (Hlatshwayo, 2013; Saliem, 2015).

It continues to play an important role in the manufacturing sector of South Africa, through raising critical issues of class interest not just for debate but for action, policy, and strategy. In the context of the automotive industry, it jointly with stakeholders and notable Motor Industry Staff Associations negotiates all conditions of employment, including wages, productivity, quality, safety, and training in the workplace (Numsa, 2016).

It has been forward-looking and open to new, creative, and innovative measures to grow the industry sustainably and was very active in the skills policies such as the National Qualifications Framework (NQF) which were implemented after the transition to democracy (Allais, 2003).

There is consensus in the literature that the labour movement was central in conceptualizing the skills development policies as early as in the 1990s, and created various initiatives to strengthen its capacity internally to constructively shape and contribute to economic restructuring debates (Bird, 2020; Ngcwangu, 2016). The Numsa not only produced the research material to support its perspective and views around training, it also established links both locally and internationally to ground its intellectual base (Ngcwangu, 2016).

Skills policies, in particular the NQF and the establishment of the skills levy, were viewed as a panacea to the Job Reservation Act and also being integral to economic strategy (Allais, 2003). The NQF arose as a consequence of negotiations between the trade union movement, particularly Numsa, and industry representatives about industrial training development in South Africa. Numsa and the broader trade union movement were particularly concerned about the poor and weak education and training system that Black people were receiving, in addition to the difficulties confronted by Black people in accessing education, and the unfair job reservation system which excluded

Black people, and on other hand, the industry was also concerned about low skills levels in the workplace (Allais, 2007; Hlatshwayo, 2013, 2017; McGrath, 1996; Ngcwangu, 2016; Saliem, 2015; Sooklal, 2005).

The principal problem of the job reservation system for Black workers was that White workers with less experience albeit with formal certificates had access to skilled jobs, yet their Black counterparts who possessed skills and experience although without qualifications could only access low-level paying jobs (Allais, 2007). Thus, the labour movement advocated for recognition of knowledge and skills that workers already possessed, in addition to experience gained in the workplace. The education policy reform debate around the 1990s were centred on equity and the economy. The social forces mainly from the working class movement and the labour union were concerned with questions around redressing the historical disparities and economic imperatives. For the the labour movement the overarching views were around work education and training and empowering of workers with skills in order to working conditions and better wages _ . Allais (2003) argues that negotiations were held and a conclusion was reached between the union and industry representatives through the National Training Board (NTB) that the national framework of learning outcomes be integrated into a qualification and part qualifications, to address the set training and skills related concerns. The union's perspective was integrated into the policy development process within the educational organization that was part of the broader mass democratic movement (Allais, 2007). Although these views were contested initially, they were integrated as part of solutions to the problems of the education system in the country and finally absorbed by the ANC through its policy structures (Allais, 2007).

There was a broader consensus across sectors and organizations around the idea of the national qualifications framework (Allais, 2003, 2007). This shows the role the trade union movement played, not only on the shop floor but also in policy issues related to skills and educational training. Numsa, together with

employer or industry associations discussed above, and government as social partners or stakeholders, negotiate industrial policy matters concerning the automotive manufacturing industry. It continues to play a significant advocacy role regarding the worker's rights, skills development programmes, improving conditions of employment, and advocating the transformation of the industry as a whole (Numsa, 2016). It has lost some of its skilled and capable leaders to parliament, government and business since the dawn of democracy.

The year 2013 was a turning point for trade unions in the South African political landscape. In its Special National Congress held in 2013, Numsa shifted the political spectrum in South Africa. It not only broke away from the SACP and ANC- aligned workers federation, the Congress of South African Trade Unions (COSATU), to form its own new federation, the South African Federation of Trade Union (SAFTU), it also formed a socialist workers party which contested the 2019 National General Elections. Despite its electoral support setbacks in the national general elections, the union is still important in the automotive sector and as shown is critical in policy discussions aimed at sustaining the industry as a whole.

2.4 THE FUTURE TRAJECTORY OF THE INDUSTRY

The automotive industry in South Africa will be impacted by a range of major technological changes which are set to rapidly change the outlook of manufacturing globally. This section shows that automation in the sector is the future and driver of the sector to compete at a global scale. There is consensus in the industry commissioned reports and the literature that the disruptions of the COVID-19 pandemic (more details in the section below) have affected the industry's performance and the economy at large (Modiba, 2020; NAAMSA, 2020). This disruption has indirectly accelerated motor vehicles design to focus on and adopt new technologies (Automotive Industry Export Council, 2021). Thyagarajan (2018) argues that technological changes and digitalization in

the sector improve its competitiveness, and set a strong base from which growth is guaranteed.

Industry commissioned reports show that rapid technological changes in the workplace are at the centre of transition to the vehicle of the future, linked to electronics, connectivity, fuel efficiency, and safety (Mabasa & Burger, 2020; MerSETA Motor Chamber, 2018). For instance, motor vehicles have computerized wheels (Mabasa & Burger, 2020). The electric or hybrid vehicles, connected cars, and autonomous driving is a grand vision of the original equipment manufacturers, in which the components must meet through new technologies (Automotive Industry Export Council, 2020). Although the cost to remain in the contest to supply the OEMs has grown, and only the big component suppliers can afford the ever increasing costs of changing technology to make the industry's vision (hybrid or electric vehicles) realizable, the ability of the components suppliers to grow largely depends on satisfying their customers (the OEMs) (Automotive Industry Export Council, 2019, 2020).

Investment in technological equipment is critical to enhance quality in production, improve efficiency, and increase productivity and also reduce waste (Deloitte, 2020; Department of Trade and Industry, 2018; NAACAM, 2019c). The success of these technological changes have been shaped by different contextual factors namely, research and innovation, research and development capabilities, large and global production capabilities, and extensive supply chain (Automotive Industry Export Council, 2021). These technological changes in the workplace seem to be taking place across all sectors at a different rate and with varying levels of impact, and employment opportunities across different sectors are becoming more reliant on digital technology (MerSETA Motor Chamber, 2018; Thyagarajan, 2018).

The emerging trends in the literature suggest that automation is broadly linked with lower labour requirements per unit of output in manufacturing, adopting

such labour-saving technologies (Frey & Osborne, 2013; Hlatshwayo, 2013, 2017; Hova, 2017; Mashilo, 2010; MerSETA Motor Chamber, 2018; Thyagarajan, 2018; World Trade Organization, 2017). Automation is regarded as crucial to save costs as labour is seen to be getting expensive to compete globally; to improve health and safety in the workplace; and to improve and standardize quality (Birnbaum & Farrow, 2018; Deloitte, 2020). The MerSETA Sector Skills Plan (2017) indicates that skills, especially maintenance skills and problem-solving skills, are required to operate and understand the company's unique technologies. The World Trade Organization (2017) asserts that a skilled workforce is to a greater extent less affected by major technological changes since it is less costly for them to acquire the additional understanding in terms of competencies and skills to adapt.

2.5 THE EFFECTS OF COVID-19 IN THE AUTOMOTIVE SECTOR PERFORMANCE

As indicated above, in this section I discuss the effects of COVID-19, to show that the sector was hit hard by the pandemic, leading to production decline and investments decrease. Although the research was conducted long before the pandemic, and this has no bearing on the substance of my research, but it does have bearing on the significance of my research; hence it is important to show the industry performed during the pandemic.

Despite the steady economic performance of the industry in terms of employment, export market, and sales as explained in the sections above, the COVID-19 pandemic had negative effects on the industry (Davies & Vincent, 2020; Deloitte, 2020; Modiba, 2020; NAACAM, 2020; NAAMSA, 2020; Trade and Industrial Policy Strategies, 2020). Although, this is not discussed in more detail because the study focused on the industry prior to COVID, suffice to indicate that COVID-19 had distressing consequences for the automotive industry in South Africa (Davies & Vincent, 2020; Trade and Industrial Policy Strategies, 2020). Some component suppliers in South Africa had to close down their

plants, following the hard lockdown (Davies and Vincent, 2020). Although hard lockdown was necessary to curb the spread of the virus, this led to significant decline in investment and trade (Daniels, 2020). More broadly, the aggregate demand for local, new vehicle sales dropped by 29.7% because the industry could not sell nor generate revenue as the production had come to a standstill (Daniels, 2020; Modiba, 2020; NAAMSA, 2020). This negatively affected exports, which also declined by 21.5% compared to 2019, compounded by recessionary pressures in the economy (Modiba, 2020).

In a nutshell, the COVID-19 pandemic negatively affected the key industry performance indicators: Production which decreased significantly, sales dropped, imports and exports underperformed to about 40% of previous figures, and the sector is likely to require the next two to three years to return to pre-COVID-19 levels (Daniels, 2020; Deloitte, 2020; Modiba, 2020; NAACAM, 2020). The industry will have to undergo fundamental changes in line with the COVID-19 regulations, and the extent to which the component suppliers withstand the COVID-19 ruins is linked to the OEMs, which need to re-open production full scale immediately (Davies & Vincent, 2020; Modiba, 2020; NAACAM, 2020; NAAMSA, 2020).

Essentially, the well-being of employees is crucial to determine the production resumption of the OEMs, which if it resumes, will quickly recover the supply chain (Davies & Vincent, 2020). Thus, creating a safe return and conducive workplace with a working plan fitting the government COVID-19 compliance is important for the industry, where some workers return to work, whilst others continue working from home (Deloitte, 2020).

The current measures earmarked to rebound the economy may not be sufficient to bring necessary support to the wider industry ecosystem in the economy. Given the decline in production, the Automotive Investment Scheme (AIS), a scheme that supports the OEMs and component suppliers

created under the APDP, will have to be re-negotiated between the DTI and the industry (Davies & Vincent, 2020). While Broad-Based Black Economic Equity transformation was a focus pre-COVID-19, there is now pressure on companies to survive and generate cash flow in the immediate term, with 37% of businesses expecting to take 18 months or longer to break even (Deloitte, 2020). The automotive firms are looking to raise this focus after 18 months and not before (Deloitte, 2020).

The AIS demands the OEMs to have a minimum of 50 000 units manufactured yearly within three years, with component suppliers benefiting in this regard in the production value chain (Modiba, 2020; NAAMSA, 2019b).

2.6 CONCLUSION

This chapter has explained the history of the automotive sector in South Africa, the key role-players, and its current challenges. The automotive sector has been and continues to be central to the South African economy because of its forward and backward linkages, despite the negative impact from the recent global COVID-19 pandemic. Industrial policy has played a major role in creating growth and the sustainability of the industry in terms of employment, exports, and sales, although the COVID-19 had unfortunate effects on all of these indicators. Industrial policy has supported multi-national corporations of both OEMs and components suppliers to produce products in South Africa through incentive initiatives, as well as government support through trade agreements and partnerships. Relative to most industries in South Africa, there is a reasonable degree of coordination amongst key social partners, in particular, two industry associations—NACAAM for the component manufacturers and NAMSA for the assembly plants—as well as the major trade union, the National Union of Metalworkers of South Africa (NUMSA).

This coordination has facilitated the implementation of industrial policy. NUMSA has also played an important role in the current skills policies in South Africa,

based on their desire for workers to gain formal qualifications and skilled work. While manufacturing companies are affected by many contextual challenges in South Africa, an increasingly important factor is technology and in specific automation.

CHAPTER THREE: THE SKILLS FORMATION SYSTEM DEBATES IN THE AUTOMOTIVE SECTOR

3.1 CHAPTER OVERVIEW

This chapter reviews literature on various aspects of skills formation that are relevant to understanding the role of skills in supporting inclusive company growth and transformation. The chapter begins giving insights into the skills training in the automotive sector drawing from Adrienne Bird's body of work. It argues that the trade union movement, the National Union of Metalworkers South Africa (NUMSA) has made an important contribution to the skills training discourse, especially in the workplace targeting those employees that didn't have formal qualifications. The skills training discussions enhanced broader debate about educational reforms or transformation given the political transition to democratic dispensation in the early 1990s.

The trade union movement contribution largely focused on the formalization of training, to benefit the workers. Policy makers argue that skills play an important contribution in terms of employment. However, they argue that skills need of the automotive sector are not addressed. Research literature has argued in the past that the sector is faced with technical skills shortage; and research commissioned by policy bodies suggests that this is still the case. A key policy body in SA argues that collaboration is important to solve skills shortages; this resonates with a large body of research literature internationally that shows how countries with more coordination among employers and unions frequently have better training outcomes. More broadly, the chapter draws on literature which shows that skills is complex. Skills are acquired in different ways and skills vary even within companies with similar economic indicators. It elaborates on the analytical framework for the study, utilizing key terms to analyse the ways in which skills programmes contribute to growth and transformation.

3.2 INSIGHTS ON TRAINING SYSTEM IN THE AUTOMOTIVE SOUTH AFRICA: THE ROLE OF NUMSA

Drawing from Adrienne Bird's body of work and other literature, the section argues that the trade union movement, NUMSA, has made an important contribution to the South Africa's skills training discourse, especially in the workplace targeting those employees that didn't have formal qualifications. The contribution of the trade union movement largely focused on the formalization of training, to benefit the workers. Bird (2020) argues that the skills development discourse has been a contested terrain in South Africa since the dawn of democracy, with various stakeholders i.e., business, labour, educational specialists, professional bodies, and even government departments and research institutes all having different perspectives when it comes to determining the skills and training system for South Africa. She confirms the existing literature (Akoojee et al., 2008; Allais, 2013, 2020; Fisher et al., 2003), and policy documents (SAQA, 2019, 2020) that the Technical and Vocational Education and Training (TVET) colleges were reformed and changed post-1994 with clear policies designed to provide quality of learning for all. She argues that Numsa's contribution to the training system was to formalize the ad hoc-, often non-formal training for workers.

The Numsa and the broader trade union movement were particularly concerned about the poor and weak education and training system that Black people were receiving, in addition to the difficulties confronted by them in accessing the education, and the unfair job reservation system which excluded Black people, and on other hand, the industry was also concerned about low skills levels in the workplace (Allais, 2007; McGrath, 1996; Sooklal, 2005). The Numsa and broader labour movement led the development of the skills training system post-apartheid, and embarked on various initiatives to enhance its capacity internally to engage on the country's economic reforms (Ngcwangu, 2016).

During apartheid, the Africans were generally excluded from training as artisans, a profession reserved for Whites, and only registered unions were allowed to participate on the apprenticeship training committees, which led and directed the training system in the workplace, and these unions (mostly white) effectively used their position to excluded the African apprentices (Bird, 2020; Hlatshwayo, 2017). In instances where African workers were accepted for training as apprentices, the requirement varied between them and their White counterparts: The Africans were being set on a higher educational entry standard than White counterparts, yet the legal minimum criteria was grade 9 (then standard seven) (Bird, 2020).

Bird (2020) draws from the experiences of workers who underwent this racially excluding apprenticeship training, to argue that employers would take from the Blacks those who had passed grade 10 (then standard 8) upwards to matric for training, but from Whites, they would only take the minimum standard of grade 9 not above (then standard 7), which was a legally accepted requirement grade (grade 9).

The union further argued (Bird, 2020) that the provision of adult education and training, which is now referred as community education and training, had not only resulted in massive deficiency of high level skills, but had also led to high levels of unemployment especially amongst those classified as unskilled, who were also denied every opportunity to improve their competencies (Bird, 2020). The union argued that the training system had thus failed the workers, and the poor. It argued that the adult education training should be recognized as providing necessary education for entry into training courses; be recognised nationally as equal to formal education standards; that there should be paid time off for literacy and numeracy training.

It argued that employers should provide facilities equal for women and men for literacy training and negotiate with unions on paying and training literacy and numeracy (Bird, 2020).

The major problem of the job reservation system for Black workers was that White workers with less experience although with formal certificates had access to skilled jobs, yet their Black counterparts who possessed skills and experience although without qualifications could only access low-level paying jobs (Allais, 2003, 2007).

More broadly, the union argued that the South African economy was not competitive globally and the emphasis on cheap labour, rather than skills, resulted in low levels of productivity. The labour movement found it necessary to find ways of recognizing knowledge and skills that workers already possessed, in addition to experience gained in the workplace (Bird, 2020). Numsa, through its Training Research and Development Group (T-RDG), argued for nationally recognized qualifications based on the completion of series of accredited courses and modules to be developed, and for these to be accredited by formal educational departments, so that holders of such qualifications could re-enter the formal education system with credits acquired in the non-formal sector/setting. The T-RDGs were established as a response to the skills problems of workers, and wider political economy challenges consisting of both experts and workers to undertake specific research as part of strengthening the labour movement's capacity (Ngcwangu, 2016).

Numsa argued for a more skilled working class to lay the foundation for a democratic socialist orientated economy, and that these skills were required if the working class were to gain and maintain control of the production. For Numsa, the industries and the state had a role to train and finance such training that workers needed. The retraining and reskilling of workers in the face

of retrenchment was what workers deserved and had a right to as a steppingstone to secure and preserve jobs (Bird, 2020).

The Unions argued for linkages between formal schooling system, adult education system, and industrial training systems, and other education and training systems for the unemployed and youth. Workplace-based training, which was often informal on-the-job training and non-formal company-based training should be linked to grading system. Bird (2020) argues that an increase in skill, either through formal acquisition or through other ad hoc training programmes in-house, should lead to an increase in pay and better conditions of employment. For Numsa, workers should be allowed as part of grading system to climb the ladder of career path from lowest to highest level through training (Bird, 2020). The union argued that these various forms of training, often in-house at company level, must be based on short courses to allow workers to progress and the courses should lead to national or industrial certificates.

There were negotiations in the mid-1990s between the trade union movement, business, and government, with a conclusion that the national framework of learning outcomes be integrated into a qualification and part qualifications, to address the set training and skills-related concerns (Allais, 2003). In other words, Numsa's views emanating from the various union study groups, including the Training Research and Development Group (T-RDG), were integrated into the policy development process within the educational organization that was part of the broader mass democratic movement (Allais, 2007; Bird, 2020; Saliem, 2015). Although these views were contested initially, they got integrated as part of the solutions to the problems of the education system in the country, and were finally absorbed by the ANC through its policy structures (Allais, 2007). There was a broader consensus across sectors and organizations around the idea of the national qualifications framework (Allais, 2003, 2007).

This shows the role that the trade union movement played, not only on the shop floor but also in policy issues related to skills and educational training.

3.3 INTERNATIONAL EXPERIENCE ON SKILLS DYNAMICS

This section draws from international experience on skills dynamics arguing that industrial policy is important to support companies that view skills development as a function of broader changes to their product market strategy and work organization. Without this support of skills by the industrial policy, Payne (2011) argues that policy efforts to boost human capital through skills programmes will be unsuccessful and will therefore neglect the utilization of critical skills in the economy. Payne (2007) argues that whilst investing in education and training is crucial for the economy because high skills are the future, ensuring effective use of skills at work to improve productivity is even more important.

The effective utilization of skills is possible when integrated to policies and strategies on productivity, work organization, and employment relations, to bring together a coherent strategy for sustainable industrial growth (Green et al., 2017; Payne, 2011). Fundamental for linkages between education and training, and industries is to identify emerging employment opportunities and skills necessary to be provided in that regard (Green et al, 2017). Cheon (2014) argues that in South Korea in a space of 10 years, education and training policies were fundamentally interlinked with the industrial strategy to drive economic growth. Without these linkages, he argues, it would have been an impossible task for the Koreans to sustain such industrial growth over that period. In the United Kingdom (UK) skills strategies have been integrated into industrial strategies (Payne, 2011). This is borne out of the realization and recognition that skills utilization adds value to economic growth in terms of productivity, enabling employment, and changes in wages, which enhances the performance of employees in the workplace (Cheon, 2014; Payne, 2007, 2011).

In USA, Canada, Australia, Belgium (Flanders), and Sweden, the vocational education system has not only offered a comprehensive range of programmes but also high participation rates because they were linked with industrial goals to drive and develop the economy (Green et al., 2017). For Payne, 2011), this shows the importance of skills integration firmly into other industrial development policies.

Skills are seen as crucial to enhance performance and improve productivity in the industrial sectors in countries as diverse as Britain and Mexico (World Bank, 2010). Brown (1999) argues that productivity and innovative learning cannot be achieved through a low level of skills, thus skills are important. Even though in the UK employers have been failing to make effective utilization of skills that are already within reach and available to them, Payne (2007) argues that the role of skills is critical nonetheless to drive productivity.

Encouraging companies and vocational training providers to change their behaviour and attitude also helps to avoid not only the wastage in skills but also underutilization of employee's capabilities (Payne, 2011). Li and Dongshu (2020) also support the need for the change of approach between industries and colleges in relation to skills development programmes in the context of the fast-growing technological advancement in the automobile sector which shapes the nature and content of jobs. For instance, the Automotive Skills Development Council (ASDC) in India has had a collaborative approach, especially between the Indian government and auto manufacturers, to skills development to enable industrial growth and ensure the availability of a required skilled workforce that meets the expectation of the automotive industry (Laseinde & Kanakana, 2017).

The Indian Automotive Skills Development Council is said to be driving programmes subsidized by the state that promote the development of

requisite skills for the automotive sector (Laseinde & Kanakana, 2017). Any successful industrial development in the world requires a skilled workforce, in addition to technology, that can perform, initiate, and manage production beyond standard tasks (Mori, Thi Xuan Thuy & Hoang, 2009). Thus, the need to embed skills with industrial policy appear crucial to ensure that new approaches to vocational training are demand-driven in terms of tying skills supply more closely to industry needs. Thus, vocational training providers must ensure that their vocational programmes and courses are tailor-made to fit the existing and projected company demand at the national, sectoral, regional, and local level (Green et al., 2017; Payne, 2007, 2011).

3.4 SOUTH AFRICA'S SKILLS DYNAMICS

There seems to be a consensus in the literature that South Africa's skills system is weak and doesn't sufficiently address the needs of the automotive industry (Department of Trade and Industry, 2011; Zalk, 2014a). Policy reports and government documents also acknowledge that the country's skills system, in most instances, tends to be supply-driven, rather than demand-driven; thus, the skills strategy report on the need to support sector-specific training programmes (Department of Trade and Industry, 2011; DHET, 2019). While there has been an awareness on the need for sectoral-skills alignment, practically this has not been the case in terms of long-term, sustainable, demand-driven skills scaled up sufficiently to address shortages at a high and intermediate level (Department of Trade and Industry, 2011; DHET, 2019; Nkiwane & Barnes, 2017).

However, the recently adopted National Skills Development Plan (NSDP) plan appears more relevant to re-orientate skills development to be more demand-led and responsive to the workplace changes in terms of work organization

and technology (Bird, 2020). The strategy seeks to ensure that South Africa has adequate, appropriate, and high-quality skills that contribute towards economic growth, employment creation, and social development (DHET, 2019). Lack of coordination between skills and industrial policy tends to result in overlap and deficiencies for the automotive sector. As a result, companies in the sector are confronted by the shortage of technical skills, which negatively affect company operations (Department of Trade and Industry, 2011; Du Toit & Roodt, 2009; Fund for Research Industrial Development, Growth and Equity, 2005; HSRC Automotive Industry, 2008; MerSETA Sector Skills Plan, 2017).

Although there has been a growing number of graduates across all fields including engineering and science, which is broadly encouraging, this number is statistically insignificant to make a meaningful impact in the automotive sector (Automotive Supply Chain Competitiveness Initiative, 2016). Furthermore, graduates from Technical Vocational Education and Training colleges tend to lack the necessary, required skills for manufacturing industries such as the automotive one (Bhorat, Goga, and Stanwix, 2014). Yet, the demand for highly skilled personnel has increased in manufacturing, thus workers who have acquired formal training are preferred over those without formal education even amongst occupations considered low-skilled (Bhorat et al., 2014). For instance, original equipment manufacturers (OEMs) tend to prefer candidates who have passed matric with mathematics and science to work on the production line, over those without formal matric certificate (MerSETA, 2018).

Formal training of employees is seen as crucial for the automotive industry to sustain the country's economy (Davies, 2018). It is critical in the context of South African industrialization which continues to be constrained by the absence of demand-driven, sector-specific skills policy and programmes. This training should be aligned with investment, employment, and technological

advancement (Department of Trade and Industry, 2007a, 2007b, 2011; Zalk, 2014a).

Zalk (2014) argues that the success of industrialization is not only about effective macroeconomic instruments, however well designed; fundamental to industrialization is also the greater consideration of integration across a range of economic policies which includes skills development that is aligned to industry needs.

The industry's skills problem is not isolated to South Africa only but is rather a global phenomenon as European automotive industries also find it difficult to recruit personnel with the necessary requisite skills. Dyson (2017) argues that the top jobs that employers are having a difficulty filling in South Africa are aligned with global trends namely skilled trades, engineering, and management or executive. However, in the global space, this is attributed to the rapid advancement of the industry in terms of electrification, automation, and digitalization all of which require a new skill set (Automotive Council, 2018). Dyson (2017) argues that while the global production in the auto industry has been automated with the introduction of robots, technical expertise is still required to manage the production operations and guide robots. These skills are also critical in driving research and development of the automotive manufacturing sector (Automotive Council, 2018). In the UK, for example, the auto industry is continuously growing and transforming; however, it is also grappling with skills challenges for short and long-term growth and productivity of the sector (Bettsworth & Davies, 2016).

As a result, the UK government and its auto industry are jointly driving programmes to develop and supply skills to the auto industry, with engineering skills being prioritized (Automotive Council, 2018). If juxtaposed with the South African context, greater measures are required within industrial policy to be spread across and within a broader range of sectors (Department of Trade

and Industry, 2011; Kruss et al., 2012). Essentially for the automotive sector, skills requirements have to be consistent with modern technology, as is the case globally (Barnes et al., 2018).

3.5 CONTRIBUTING FACTORS TO SKILLS PROBLEMS IN THE SECTOR

This section, as earlier indicated, highlights the perceived contributing factors to skills problems in the country broadly, with a specific focus on the sector. Unlike in the global space where the skills shortage is attributed to the rapid advancement of the industry in terms of electrification, automation, and digitalization, in South Africa there seem to be several reasons attributed to skills problems for the industry (Automotive Supply Chain Competitiveness Initiative, 2016; Du Toit & Roodt, 2009; MerSETA Sector Skills Plan, 2017).

More generally, the country's education system is seen to be failing the economy as it performs lowly compared to its counterparts such as Tanzania and Zimbabwe (Ngozo & Mtantato, 2018), and this despite higher expenditure on education, even compared to advanced economies such as the United States and the United Kingdom. Furthermore, the country's Technical Vocational Education and Training (TVET) system is seen to be continuously inconsequential, yet weak also in sub-Saharan African countries, despite various reforms by successive governments on the continent (Allais, 2020; Oketch, 2007). Du Toit & Roodt (2009) argue that the TVET system was designed to address demands of manual skill for low wage industry.

In the context of the auto industry the following constraints seems to be the reason for lack of skills: Firstly, weak and poor coordination and articulation pathways across the entire education and training system in South Africa is perceived as a major contributing factor to the technical skills deficit (Department of Trade and Industry, 2011; Kruss et al., 2012; MerSETA Sector Skills Plan, 2017). This might explain why the industry has been reluctant to absorb

TVET engineering candidates because the work-experience component in terms of training is not enforceable (MerSETA Sector Skills Plan, 2017).

This results in candidates' inability to find workplace-training opportunities which are a requisite for graduation for students from universities of technology and this contributes to skills deficiency (Du Toit & Roodt, 2009; MerSETA, 2018; MerSETA Motor Chamber, 2018). Papier (2017) argues that a lack of practical components to support theoretical learning is one of the reasons that has led to the TVET sector being critiqued.

Secondly, engineering graduates from higher education institutions are limited or very few in terms of numbers, and have to respond to all sectors of the economy which require their skills and not only the manufacturing automotive one (Automotive Supply Chain Competitiveness Initiative, 2016). Therefore, there is stiff competition between manufacturing sectors such that the continuous increase of output of engineering graduates always falls short in addressing the industry skills deficit and the economy at large (Automotive Supply Chain Competitiveness Initiative, 2016; MerSETA, 2018; MerSETA Sector Skills Plan, 2017). Moreover, engineering programmes are affected by the poor quality schooling system with low enrolment in maths and physical science, in addition to low-quality teaching personnel, and this poses a threat to any aspirations of developing a substantial number of engineers, not only for the automotive but for all sectors (MerSETA Sector Skills Plan, 2017).

Thirdly, there is also a general decline in output qualification in all engineering fields, attributed to both the 2015 student revolt and the increasing levels of dropout in this engineering stream (MerSETA Sector Skills Plan, 2018). This exacerbates the already-mentioned weak and poor preparation at the schooling level (Du Toit & Roodt, 2009).

Fourthly, the apprenticeship training system which was responsible for technical skills in the industry was replaced by a learnership system, and this is

seen to have resulted not only in the surge of soft skills but also weak training because of what appears to be a relative neglect of investment in dedicated training, equipment, and curricula in the more hard but required skills by the industry (Zalk, 2014). The apprenticeship system was revised but the fundamental problem remains the quality of training which affects the skills being produced (Kruss et al., 2012), and this is a major weakness concerning skills development for the manufacturing industry in South Africa (Zalk, 2014).

The fifth reason is the quality of qualification which is seen as contributing factor to skills problems in the industry, especially in newly qualified technicians and artisans (Automotive Supply Chain Competitiveness Initiative, 2016); MerSETA, 2018).

3.6 COLLABORATIONS TO ADDRESS SKILLS DEFICIT

This section gives more details on the importance of stakeholders' collaborations to address the skills problems in the sector. There seems to be a consensus amongst key role players in the sector that partnerships are central in addressing the skills shortage facing the industry. For instance, the merSETA's relationship with many TVET colleges, universities, and local and provincial governments is borne out of the skills strategy imperatives and the industry at large (Automotive Supply Chain Competitiveness Initiative, 2016; MerSETA, 2016; MerSETA Motor Chamber, 2018).

The Automotive Supply Chain Competitiveness Initiative (2016) reported that collaborations with universities are ongoing with the focus being on establishing research-based infrastructure for building capacity in the TVET arena. The Automotive Supply Chain Competitiveness Initiative (2016) further relayed that these initiatives between educational institutions are geared towards supporting the TVET lecturers, especially those without trade tests or artisans to devote some time to MerSETA industries with the option of a trade test post the work-integrated learning (WIL) intervention.

This is done to enhance TVET-industry relations and exposes TVET lecturers to industrial machines, productivity, and compliance standards. The central feature of these initiatives is the learning pathways of learners progressing to become trade-tested artisans. In addition, the MerSETA partnership with DHET supports TVET college lecturers with the aim of the professional development of the lecturers in engineering (Automotive Supply Chain Competitiveness Initiative, 2016; MerSETA, 2016; MerSETA, 2018; MerSETA Motor Chamber, 2018).

The establishment of the Automotive Industry Development Centre (AIDC) by the Gauteng Provincial Government in 2001 was another initiative to address skills shortages and skills transfer needs in the automotive industry (Laseinde & Kanakana, 2017). Laseinde and Kanakana (2017) argue that the provision of training or skills development is one of the main focuses of the AIDC strategy and almost all its programmes have contributed to skills development in one way or another.

The Automotive Industry Development Centre (2017) asserts that most of its programmes, especially skills development and training, provide direct training to target groups, mostly youth and women, in addition to other programmes that drive training indirectly.

It acknowledges that Tshwane Automotive City is the only project not yet playing a role in skills training, and it hopes to incorporate training and educational facilities here in the future, (Automotive Industry Development Centre, 2017).

The Automotive Supply Chain Competitiveness Initiative (ASCCI) was established in 2013 by original equipment manufacturers (OEMs), component suppliers, government, and labour to build a successful and formidable local auto industry with regards to both skills required on the shop floor and technical expertise, the lack of which are hampering operations (Laseinde & Kanakana, 2017).

The mandate to drive industry skills needs led the ASCCI to embark on full-scale research to uncover the automotive industry skills needs to ensure necessary steps are undertaken to provide necessary training taking into consideration the skills needs of the industry (Laseinde & Kanakana, 2017).

The ASCCI seems to have been successful in uncovering skills and has benchmarked with various countries, especially in Asia, with regards to skills at various levels (Automotive Industry Development Centre, 2017; Automotive Supply Chain Competitiveness Initiative, 2016). MerSETA (2017) also acknowledges that a lot of work has been done since the establishment of the ASCCI in terms of best-in-class training facilities in line with industry skills needs in terms of quality.

3.7 BROADER DEBATES ON SKILLS FORMATION LITERATURE

This section discusses various debates around the skills, knowledge and work nexus, and the various ways in which skills are acquired. The literature seems to suggest that the relationship between skills, knowledge, and work is a complex global phenomenon, which is embedded in an economic system such as industrialization and innovation, political, cultural, and education prevalent worldwide (Allais, 2015, 2020; Ashton, 2005; Bosch, 2017; Brown, 1999; Brown et al., 2020; Hall & Soskice, 2001; Winch, 2007).

The nature of the skills formation system as a global phenomenon is understood differently within different national contexts (Bosch, 2017). In other words, there are variations in countries on how skills are acquired; some people acquire skills through formal education and training process in Technical Vocational

Education and Training(s) and universities; others acquire skills in the workplace informally through learning by doing (on the job training); dual formal type of training which combines workplace component and formal education institutional-based component is a third option; also skills can be acquired in various ways of working life (Allais, 2015; Bosch, 2017; Singh, 2015; Treat et al., 2012; Wes, 2011; Zambarloukos & Constantelou, 2002). Moreover, there are different national skills formation systems even within countries (Bosch, 2017).

Bosch (2017) argues that skills formation systems vary even in countries with similar levels of economic trajectory, technologies, and products and services. For him, skills are social institutions with the scope of independent action, which are not determined by technological changes or practical constraints specific to individual countries (Bosch, 2017). Allais (2015) supports the narrative that skills are acquired in a different context, which can be formal provision, non-formal, informal provision, and formal dual type of training and on the firms' premises.

Interactions at a firm level play an essential role in influencing a skills regime. Hall and Soskice (2001) argue this happens because companies have a comparative advantage based on their strategies for resolving coordination challenges within different spheres of interaction. These diverse spheres of interaction are: industrial relations, which involves workplace coordination and wage bargaining councils; vocational training, in which companies and workers dedicate resources and time to develop specific skills for internal use; inter-company relations within the value-chain, to coordinate companies, customers, providers and competitors; and workplace relationships amongst workers (Hall & Soskice, 2001).

Porter (2003) also supports the argument that companies shape skills system through coordinating training systems, collective bargaining, resource supply, and acquiring necessary capital with other firms. Busemeyer and Iversen (2012)

argue that unemployment tends to decrease if there is a strong participation of companies in vocational training, which is accompanied by a level of collective bargaining concentration.

The literature on skills regime seems to suggest that whilst formal training in the traditional classroom setting is important, it is not necessarily the only and the best way to learn skills (Allais, 2015; Bosch, 2017; Treat et al., 2012; Zambarloukos & Constantelou, 2002). There are various ways in which skills can be learnt or acquired, and the sub-sections below discuss these different skills, illustrating the overall argument in literature about the complex nature of skills, knowledge, and work relationship (Allais, 2015).

3.7.1 Formal education institution-based TVET programmes

There seems to be a consensus in the literature that formal training, which is institutionally based, is one of many forms of acquiring skills, and may not be the best one for companies, albeit necessary for entry in the world of work (Zambarloukos & Constantelou, 2002). This type of training is formally structured and institutionalized, intentionally planned, and offered through public education institutions such as colleges and universities and recognized private education providers, and, in its totality, constitutes the formal education system of a nation (International Labour Organization, 2012; United Nations Education, Scientific and Cultural Organization, 2011).

It takes place in classroom-based formal educational settings, and upon completion of the duration of the programme, a degree or diploma certificate is awarded (Manuti et al., 2017). In other words, formal training is about formal qualifications (Misko, 2008). It is seen as crucial for technical skills that the economy needs to improve growth in the form of productivity, enhance sector

competitiveness, improve wages and decrease unemployment. Zamburloukos and Constantelou (2002) argue that in the global economy, which is knowledge driven, formal training is a major contributor to economic growth and society's development. Formal TVET-based training programmes are seen as useful in providing the technical skills necessary for a living, and also for equipping people with self-employment strategies and entrepreneurship skills (Afeti, 2018; Mulder, 2018; Winch, 2007).

Kapur (2019) argues that formal training helps candidates to get employment opportunities in the formal workplace and also enhances their productivity. Through formal training people are able to gain skills that enable them to acquire and create employment opportunities; and formal training continues to be the main path to recognised qualifications, and is required for entry into jobs, especially regulated occupations (Kapur, 2019; Misko, 2008).

For Oketch (2007), formal vocational education and training is designed to develop the skills for relevant for particular occupations, and also prepares for entry or re-entry in the world of work. De La Harpe et al. (2010) argue that employers are often looking for flexible and multi-skilled employees who possess analytical and critical innovation and also able to problem solve. Thus, formal training is seen as important in producing high and professional skills necessary for both social, and personal development in addition to economic growth.

3.7.2 Non-formal workplace based training

Non-formal training is also institutionalized, intended, and planned by an education provider, in this context by the firm (United Nations Education, Scientific and Cultural Organization, 2011). Non-formal work-based training is seen as useful by employers because companies are often interested in the outcomes of learning rather than the form of learning (Misko, 2008). Misko (2008) argues that non-formal training offers basic technical skills and

knowledge required for the jobs and for compliance with legislative requirement. He argues that it also enhance problem solving capabilities, teamwork and communication skills, all of which are essential in the workplace. In instances where companies are struggling to find the requisite skills, they resort to training employees on site, which is often company-based and non-formal (Werquin, 2010).

The workplace has become a site of training even to people who have formal training, associated with two different purpose but beneficial to both parties; the employer and the employee. Firstly, workplace training is about the development of the company through contributing in the production, effectively and innovatively; and secondly, the development of employees through enhancing their knowledge, skills (albeit non-formally) to further their own development as employees and citizens in society (Manuti et al., 2017). Candidates or employees who undergo non-formal training are often utilized by companies to induct new employees into the culture of the company (Kapur, 2019; Manuti et al., 2017; Misko, 2008).

Manuti et al. (2017) argue that non-formal training cannot be understood as a separate process that has nothing to do with the wider social, political, and economic context. They argue it is linked to changes in the knowledge economy with wider objectives; to link development of an employee with development of the company, through an emphasis on sustained development and training processes as well as training outcomes (Manuti et al., 2017; Misko, 2008). The literature suggests that non-formal training is also about educational framework broadly concerned with the principles, the practices of learning, and the relationships between training in different contexts (Kapur, 2019; Manuti et al., 2017; Misko, 2008).

3.7.3 Formal dual type of training

This type of training is also known as apprenticeship training which is formal and offered against a national qualification, with a workplace component and an education institution component. The International Labour Organization, (2012) asserts that the formal apprenticeship is a system in which an apprentice acquires the skills for a trade in the working environment, is trained by an experienced craftsman, and this training is often complemented by classroom-based instruction.

It is different from other formal training happening in formal education institutions because apprentices are attached to the company, and spend a significant amount of their time in the workplace (McIntosh, 2006; Mohrenweiser & Backes-Gellne, 2010; Smith, 2006). McIntosh (2006) supports the argument that it is a structured training of vocational preparation, offered by the companies, juxtaposing part-time education with on-the-job training and work experience, leading to a recognised vocational qualification at trade level. Smith (2006) also argues that apprenticeship training is a formal part of the national educational system in many European countries especially in the Netherlands and Germany.

In Germany, it is often viewed as an investment of companies into the human capital, and companies often undertake it by weighing current productivity against future benefits from employing and training apprentices (Mohrenweiser & Backes-Gellne, 2010; Smith, 2006). Employers undertake this type of training because they perceive TVET-based training, albeit formal, as tending to produce more academic-type qualifications, while employers require more hands-on and practical skills. An apprenticeship is linked with higher pay and a greater chance of employment, and candidates with this type of training are often viewed as productive, efficient, and able to minimise costs and reduce defects in the workplace (McIntosh, 2006).

3.7.4 Informal on-the-job training

This form of training usually happens on the job, is specific and linked to new machines, and is often provided by the machine suppliers as part of skills transfer. It is conducted intentionally but is not institutionalized; it is less organized and less structured (United Nations Education, Scientific, and Cultural Organization, 2011). In most countries there are efforts of putting systems in place to ensure that informal on-the-job training is encouraged, formalized, and recognized (Singh, 2015; Werquin, 2009, 2010).

Werquin (2009) argues that calls for the recognition of informal skills training often is based on considerations of social justice. For him, recognition of these types of skills has a double currency or benefit, especially in advanced European countries: (1) it allows candidates to re-enter the formal education and training system, and (2) it gives people access to the labour market, and the labour market is a central feature in the skills training debates.

The International Labour Organization (2012) report that companies offer technology-linked training, which usually takes place on-the-job. Singh (2015) argues that informal training is crucial for firms as it enhances employees' competences, and lowers some of the barriers to obtaining qualifications or becoming qualified. It recognizes existing skills that workers possess and tailors those skills to the actual demands of the workplace. Informal training provides appropriate encouragement to workers to expand their competencies and abilities in such a way that benefits the firms and themselves as employees (Manuti et al., 2017; Singh, 2015).

Singh (2015) cites Taylor and Evans (2009) and Livingstone (2001) to argue that informal training is not simply self-directed, but encompasses the relationships among between employers and employees, context and opportunities. He argues that coaching and mentoring, and partaking in a focused discussion in the workplace or in committees is part of informal training. For him, informal

training is also a complex process that involves the interplay of employee agency, workplace relationship, and interdependencies of the wider environment.

3.7.5 Secondary school-based training

Secondary education refers to a curriculum which remains overwhelmingly general or “academic” in nature, but also has vocational or practical subjects as a minor portion of the students' timetable during the secondary school course (Shavit & Muller, 2010). Shavit and Muller (2010) argue that the academic nature of training prepares candidates for college or university entry, while the vocational subjects helps them for entry into the world of work, thus reduces the odds of unemployment and the chances of candidates entering formal employment as unskilled.

Schoer, Ntuli, Rankin and Sebastiao (2010) support the argument by Shavit and Muller (2010) that school-based training signals academic ability at university level, thus school training is dominated by academic or general subjects. They argue that the national senior certificate (also known as the matric certificate) illustrates not only current knowledge and abilities of candidates but also their ability to progress successful in their chosen studies. Furthermore, school-based training has become more important given the competitive labour market environment (Carrol, 2020). Carrol (2020) argues that having a school-based certificate (matric) is a necessary requirement, albeit a minimum one, for a number of jobs.

Technological advancement is seen to have influenced these changes, and the matric certificate is to give candidates minimum yet crucial skills for employers; the ability to read and write, and to have numeracy and literacy skills. She argues that with matric, candidates are also seen to possess the

ability to think independently and creatively when working under pressure, and to be able to problem-solve.

Candidates with school-based training are seen to be able to keep up with technology changes in the workplace (Carrol, 2020). Although these different types of trainings are often provided outside the formal education system, they also contribute to knowledge creation and skill formation (Zambarloukos & Constantelou, 2002).

Zambarloukos and Constantelou (2002) argue that formal training in the traditional classroom setting is not necessarily the best or only way to learn many skills for a livelihood. They argue that various studies have shown that the human resource potential is not a simple outcome of the formal education system but is a much more complex process that involves tacit knowledge (Gamble, 2004; Young & Gamble, 2006), learning by doing, by using, and through cooperation with others.

They further argue that knowledge is socially embedded and socially created (Baptiste, 2001; Brown, 1999; Singh, 2015; Werquin, 2010; Zambarloukos & Constantelou, 2002). Allais (2003) argues that the recognition of these various skills obtained outside the formal provision of education is anticipated to help individuals in the world of work.

This led to the rise of the national qualifications framework, which policy makers hope will organize credentials to regulate the complex nature of the relationship between education systems and labour markets, and also to provide a baseline for providing certificates to those who have gained knowledge and skills albeit outside of formal provision (Allais, 2003, 2007, 2015). I have described these forms of training in which skills can be acquired to construct an analytic framework to help me understand the extent to which skills contribute to inclusive growth and transformation.

3.8 CONCLUSION

This chapter has shown that the South African skills system is weak and doesn't sufficiently address the needs of the automotive industry because it is more supply driven than demand driven. Insights into training in the automotive sector: It has been contested sector. Numsa played a critical role in ensuring that there is training in the workplace targeting those that don't have formal qualifications.

This was largely focused on formalization. Policy makers argue that the skills needs of the automotive are not addressed. Research literature has argued in the past that the automotive sector is confronted with a technical skills shortage, and research commissioned by policy bodies suggests that this is still the case.

A key policy body in South Africa argues that collaboration is important to solve skills shortages; this resonates with a large body of research literature internationally that shows how countries with more coordination amongst employers and unions frequently have better training outcomes. More broadly, the chapter draws on literature which shows that skills is complex. Skills are acquired in different ways and vary even within companies sharing similar economic indicators.

CHAPTER FOUR: METHODOLOGICAL DESIGN AND ANALYTICAL FRAMEWORK

4.1 CHAPTER OVERVIEW

In this chapter, I focus on the analytical framework utilized to analyse the data and methodological design informing the data collection process. In terms of methodological approach, I have followed the same approach of the project team as a whole, which I also contributed to designing. I have divided the chapter into six sections. In section one, I briefly reflect on the project as a whole, in which this research study is derived. In section two, I describe the three methods that I utilized for data collection. Section three discusses the sampling process and procedures, while section four discusses the data collection process. Section five presents the analytic framework I constructed to bring key concepts into a relationship with each other to understand the contribution of skills to industrial growth and transformation. In Section six, I discuss ethical procedures followed to ensure anonymity and how the confidentiality of the participants' information is upheld, in line with university ethical standards and policies when conducting research.

4.2 OVERVIEW OF THE PROJECT

As I have indicated in Chapter 1, this research is part of a bigger project underway in six developing countries, namely, Bangladesh, Cambodia, Ethiopia, Laos, Vietnam, and South Africa. The project broadly, aims to investigate the critical factors that help or obstruct the contribution of formal technical vocational education and training to inclusive industrial growth and transformation in two manufacturing sectors per country. The South African component of the project targeted three manufacturing sectors, namely the automotive sector, which my study researched, the clothing and textile sector, and the food and beverages manufacturing sector.

As discussed in Chapter 1, both the South African component and my research study, focused on formal TVET programmes to understand the extent to which they help companies grow and transform. In addition, for the case study phase, as indicated in Chapter 1 I focused on mid-skilled employees (MSEs) and high skilled employees (HSEs) to determine whether formal training programmes focusing on high skills are more significant than others and which specific skills programmes are seen as most relevant by companies.

RESEARCH QUESTIONS

What are companies' perceptions of the contribution of formal Vocational Education and Training programmes to industrial transformation and inclusive growth?

Research sub-questions:

1. To what extent do formal TVET programmes contribute to industrial growth and transformation?
2. Are Technical Vocational Education and Training programmes that focus on higher skill levels more likely to contribute to inclusive company growth and transformation?
3. Do formal pre- and in-employment training programmes help companies regarding skills needs?
4. What are the underlying factors that shape or influence skills contribution to company growth and transformation?

4.3 RESEARCH METHODS

In this section, I discuss the data collection methods applied by both the project since its inception in September 2017, and also for my PhD study, showing that the project relied on two sources for data collection. Firstly, we conducted contextual studies to provide descriptive accounts and historical overview of the political and economic context, industrial and labour market settings in three selected industries, automotive, clothing and textiles, and food and beverages, as well as the TVET programmes catering to these selected industries.

Secondly, we utilized a mixed-methods approach with two different data sources namely, an online web survey (quantitative component) to collect data covering 847 individual companies across six countries for the project; and case study interviews (qualitative component) to explore the specific features that are seen as important and make certain TVET skills programmes significant for companies in the three selected industries. For the purpose of my study, a total of 113 manufacturing companies both OEMs and component suppliers were surveyed, and of this number, a total of 61 companies completed the survey.

In the case study phase, a total of 24 companies were interviewed in three sectors, 11 of which were from the automotive sector, and all of which have reported growth and transformation. These were interviewed to understand the formal TVET programmes that are seen as important and relevant for company growth and transformation. I now turn to an explanation of how the role players and participants in the automotive companies were identified as well as the sources of data such as reports, documents, etc.

4.3.1 Selection: Sector Identifying Process

The automotive industry was identified because of its importance in the country's economy as explained in Chapter 2, and it is regarded as a successful industry because of the solid government policy framework and healthy relationship and collaborations between industry, government, and unions. The automotive industry has been growing and impacting directly on many important economic policy goals, such as contribution to GDP, skills development, economic backward and forward linkages, technology, and innovation. It is highly automated, particularly the Original Equipment Manufacturers (OEMs), also referred to as the auto assembly plants, and it is highly subsidized and highly protected in terms of tariffs.

I identified relevant social partners and role-players within the identified manufacturing industries. This led to an in-depth understanding of stakeholders especially in the automotive industry, which resulted in further consultation. These stakeholders included employer associations, relevant government departments, and trade union movements.

The intention was to inform these stakeholders about the research broadly, its importance in relation to skills, and to explore their willingness to partake and support the research in many ways, i.e., availing relevant documented information and reports to enhance the research. The stakeholders were kept abreast from the beginning, during, and through the end of this research study. As presented in Chapter 2, I identified the key role-players, such as NAACAM, NAAMSA, and Numsa as a trade union organizing in the automotive industry in South Africa.

I explained to these key industry role-players the project broadly and the importance of this research on skills in the context of South Africa, and requested their support to ensure that the study was a success.

It is through these meetings, various emails, and telephonic exchanges that the associations agreed to support the study. In addition, a letter of endorsement was granted by the employer associations namely NACAAM and NAAMSA who had opted to distribute the survey to their members.

4.3.2 Mixed Methods

As indicated in the section above, I employed mixed methods to understand the perceived contribution of TVET programmes to inclusive company-level growth and transformation patterns. The literature suggests that when employing a mixed-method approach as a data collection method, social researchers are not bound to narrow techniques associated with traditional research design, qualitative and quantitative (Creswell, 2002; Denzin, 2012). For Shorten and Smith (2017), it is about purposeful mixing of methods for data collection, analysis, and interpretation of results, with the term “mixed” being a keyword that enables the researcher to integrate data emanating from different strands and through diverse research lenses.

Creswell (2002) argues that the importance of using both quantitative and qualitative approaches is that the strengths of one method complement the weakness of the other so that together they provide a detailed and complete picture of the phenomenon in question. Sloodman (2018) argues using mixed methods has many advantages; it gives voice to participants/respondents to ensure that research results reflect their voice grounded from their lived experiences. Unlike the single method, the application of a mixed approach in empirical evaluation research is flexible to allow more coherent synergy in data utilization, and is an ideal technique to assess complex interventions over a while (Babbie & Mouton, 2001; Chadwick et al., 1984).

Shorten and Smith (2017) argue that it's through these diverse approaches that could also be integrated that the researcher can explore to uncover connections that occur between intricate layers of research questions.

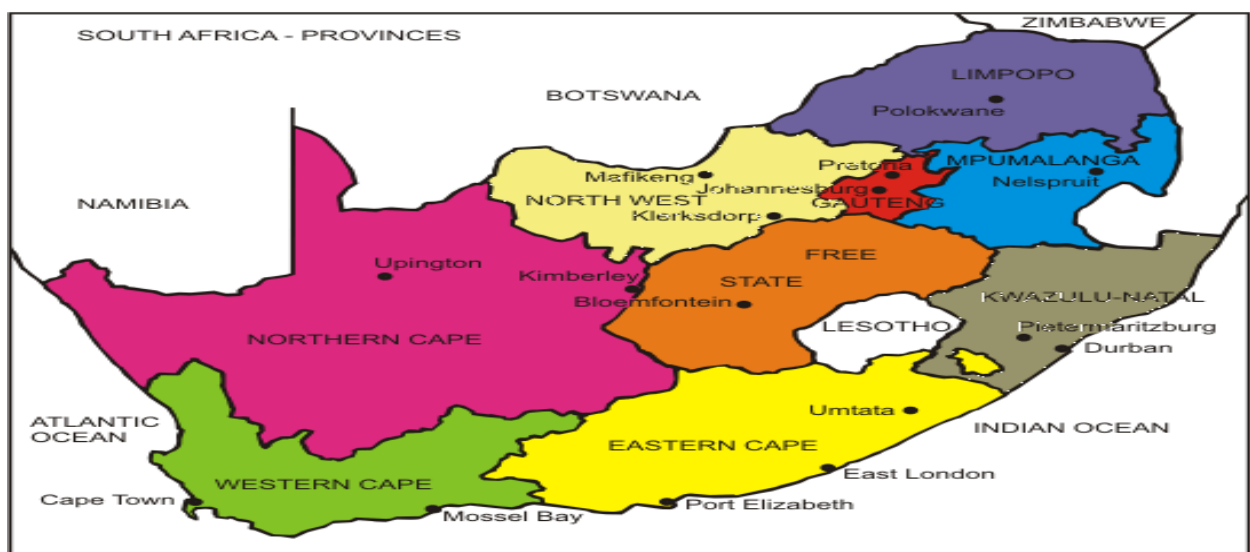
I utilized mixed methods to gain significant insights regarding two variables which are of focus and central to the study namely, company growth and transforming, and the extent to which skills play a role. The mixed methods utilized were quantitative (survey) and the qualitative (interviews).

4.5 SAMPLING PROCESS AND PROCEDURES

4.5.1 Scope of the research

As I have explained in Chapter 2, I have undertaken this research in three provinces in South Africa namely, Eastern Cape, Gauteng, and Kwa Zulu Natal, because it is in these provinces that the industry exists, although increasingly, there is also some automotive development taking place in Western Cape. Figure 1 below is the map of South Africa, in which the study takes place with all the 9 provinces and major metropolitan or cities per province.

Figure 1: Map of South Africa



Source: <https://www.mapsofworld.com/south-africa/southafrica-political-map.html>

Figure 2: Map of the Eastern Cape

Figure 2 below is a Map of the Eastern Cape Province. It has a sound manufacturing base, primarily in the automotive industry. It is often referred to as the heartbeat of the auto sector in South Africa. When the auto industry came to the South African market, it happened to establish its presence in this province and the province has three of seven original equipment manufacturers (hereafter, OEMs), with several components manufacturing suppliers as well. The auto companies in the Eastern Cape are found in two regions/districts namely, Nelson Mandela Bay (now known as Gqeberha) and Buffalo City (known as East London). The companies that participated in the study from the Eastern Cape came from these two cities or regions.



Source: <https://www.roomsforafrica.com/dest/south-africa/eastern-cape.jsp>

Figure 3: Map of Kwa Zulu Natal

Figure 3 below is the Kwa Zulu Natal Province (KZN), the second of the three provinces in which the research was conducted. The KZN province has the

second-largest economy after Gauteng. One of the seven OEMs is based in this province, and several components and parts companies (also referred to as component suppliers) also exist in the province. The auto companies are based in Durban, Pinetown, and Pietermaritzburg. Manufacturing is largely dominated by pulp and paper, chemicals, and food and beverages as the largest sectors, followed by finance, trade, tourism, and agriculture, and it has an airport too, King Shaka Airport, which provides easy access to Durban.

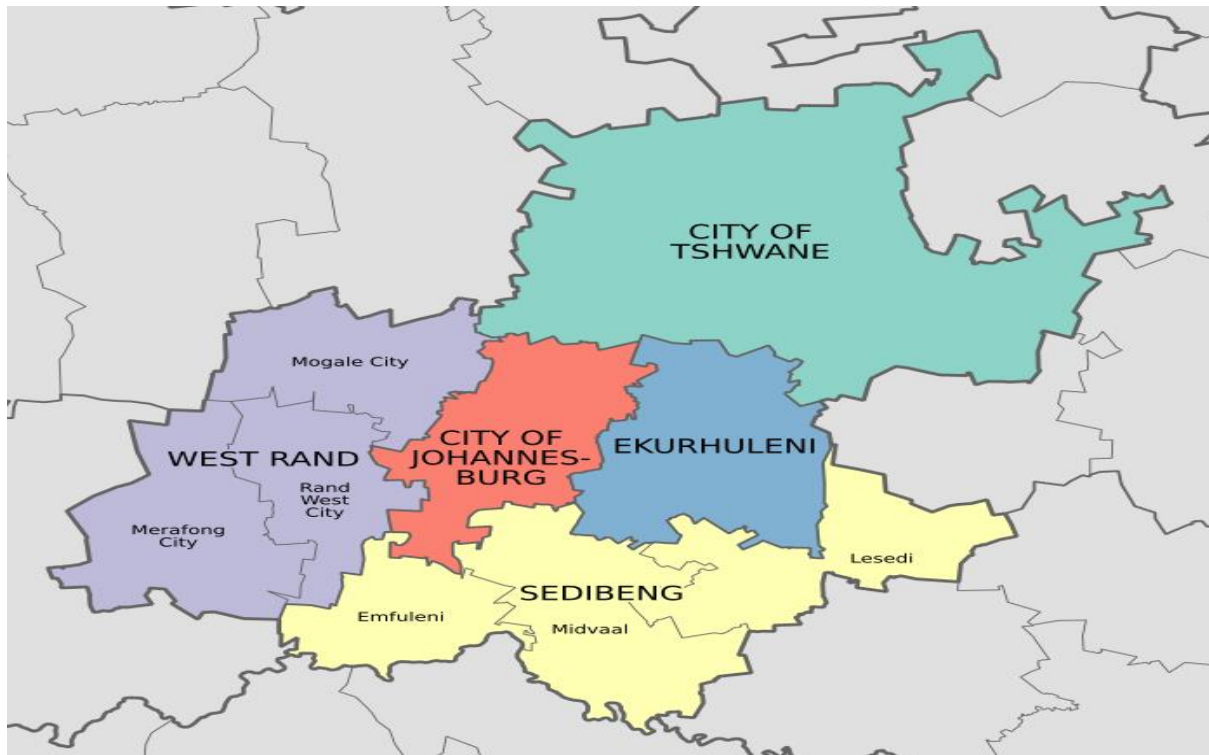


Source: <https://www.google.com/maps/place/KwaZulu-Natal/@-28.9262832,28.6383794,7z/data=!3m1!4b1!4m5!3m4!1s0x1ef1100e59e20e55:0x826178a76be4d98d!8m2!3d-28.5305539!4d30.8958242>

Figure 4: Map of Gauteng

Figure 4 below is the Gauteng Province which is the economic hub of the African continent and accounts for roughly 10% of the Gross Domestic Product (hereafter, GDP). Although it is the smallest of the country's nine provinces, it remains the financial and industrial economic hub of the continent. It has three of the seven OEMs, based in the City of Tshwane, and the majority of the component suppliers are scattered across different cities of the province such

as Ekurhuleni and the City of Johannesburg. The Gauteng Growth and Development Agency (GGDA) through its two automotive-specific subsidiaries, the Automotive Industry Development Centre (AIDC) and the Automotive Supplier Park (ASP), provides support to the auto industry and is also tasked with the promotion of trade and investments, and project implementation to strengthen certain economic activity areas.



Source: <https://www.gauteng.net/pages/page/geography>

4.5.2 Sampling for survey process

As discussed in Chapter 2, the South African automotive industry incorporates the manufacture, distribution, servicing, and maintenance of motor vehicles and components, which is about 480 companies. This number of 480 companies or lists was obtained through the “Who is who” database. The number was then verified against two employer associations operating in the

sector namely, the National Association of Components and Manufacturers (NAACAM), and the National Association of Automobile Manufacturers of South Africa. These two associations were important for verification process because both the OEMs and component manufacturing suppliers are affiliated in these two associations respectively. The process of verification of these companies was twofold: firstly to confirm the existence of the companies within the auto sector, and secondly to identify and remove those that were not in the manufacturing space. Consequently, dormant companies—those that couldn't be reached telephonically, via emails, and/or had no active physical address or website—were excluded from the list. I also excluded companies that were only doing professional or service operations. After this process, the number of companies was reduced to about 160 manufacturing companies. Size and the location of companies were a further consideration: Companies that had 50 or fewer employees were excluded as they were considered too small for sampling, thus resulting in the number being 113 in total, which is inclusive of all the original equipment manufacturers (OEMs), and component manufacturing suppliers in South Africa, and these were surveyed during the first phase. , 113, includes the original equipment manufacturing (OEM) companies and component manufacturing in South Africa.

4.6 DATA COLLECTION INSTRUMENTS

4.6.1 Survey component

For my study, I administered the survey to hundred and thirteen automotive companies, both the OEMs and component suppliers. I participated and contributed in the research design of the instruments for both phases. Formal The design of the survey phase questionnaire which I contributed drafting was structured according to five different sections to examine whether formal TVET programmes contribute to inclusive company growth and transformation or there are other specific programmes that are seen crucial in this regard. Furthermore, the survey was intended to determine the extent to which

companies are gender inclusive in terms of wages and employment during the 2014 and 2019 period. More narrowly, through the survey, I wanted to unearth relevant data regarding the following issues:

- Whether companies have experienced skills shortage at all levels in the period between 2014 and 2019, and the effect this has had on company operations and growth?
- What are the most three frequent pre- and in-employment formal training qualifications/programmes workers at the five occupational held in the last five years?
- How do companies perceive skills programmes from TVETs?

I wanted to uncover the contribution of these pre-and in-employment formal programmes on company growth and transformation. Furthermore, the following issues were relevant to understand the growth and transformation patterns in the companies:

- Whether the number of employees have increased or decreased in the last five years;
- Whether the number of women has grown or declined in the last five years;
- Whether historically disadvantaged persons have grown or declined last five years;
- Whether there has been any increase or decrease of incentives to employees (either monetary or otherwise) at all levels in the last five years;
- Whether there have been any changes in technology, work organization, and products, and whether that has made the production complex or simpler;
- Whether there has been an increase in sales and export shares in the last five years, and also to understand the extent of foreign direct investments in the automotive industry in the last five years.

These questions were important to understand the extent to which skills have helped companies to grow and transform. The survey was then sent to two employer associations, namely the National Association of Automobile Manufacturers of South Africa (NAAMSA) and the National Association of Automotive Component and Allied Manufacturers (NAACAM) to distribute it to 113 manufacturing companies identified through the process explained above.

During the consultation process, as indicated in the section above, the associations as part of their support of the study preferred that the survey be sent through them to their member companies. This proved to help minimize lack of participation or general disregard, which may have led to no participation at all by companies. The survey process ran from October 2018 to February 2019. The response rate was good, as explained above that 61 out of 113 manufacturing companies participated by completing the survey and of this number, about 31 companies indicated interest to participate in the case study/qualitative phase.

The responses given by the companies are those of sampled companies and may not be representative of the companies in the sector overall. However, the wide composition and diversity of the companies sampled do offer good insights into several issues at play, behaviours, and company perceptions in the automotive industry as a whole. This is because of the seven OEMs, only one who did not participate; and of the 113 components suppliers, 56 took part in the survey.

4.6.2 The Survey Analysis Process

For the interpretation and analysis of the survey results, I utilized the Statistical Package for Social Sciences (SPSS), which is a multi-purpose statistical package relevant to assess similarities, correlation, explore, summarize, and analyze the perceived role of TVET programmes on two variables with which the study is concerned namely, growth and transformation. SPSS is mostly used

by universities in social science research. Afghah (2018) argues that it is relevant for big data to assess the similarities, correlation, difference, or even dependency of different variables. It helps to arrange variables by column and cases by row with each variable having more than one value.

We calculated the number of TVET programmes mentioned by each company for each occupational level at the point of hiring and for training existing employees. We have used this as a proxy to determine the extent to which companies utilize TVET programmes for pre- and in-employment, and the extent to which they contribute to growth and transformation. With the help of the South African team through workshops, I ran frequencies and crosstabs for variables such as growth and transformation.

SPSS helped me to identify the key and emerging themes around skills availability at all levels; the extent to which companies have experienced shortages and the effect of skills shortage on operations and growth; the training programmes that employees at various levels had pre-employment and those acquired in-employment; the institutions that provided these programmes; as well as the contribution these programmes have on company skills needs.

The analysis of the survey further helped to trace if companies are growing in terms of employment, salaries, sales, and exports; and whether or not there have been changes in terms of technology, work organization, and product change. While causality cannot be inferred, a possible explanation is nonetheless given for the observed linkages which are consistent with available and existing literature, and the case study results may enhance some of the limitations of the survey.

4.6.3 Sampling for the Case Study Phase

The project team targeted six companies per country sector, which was distributed according to growth status. Following the sixty one companies that

participated in the survey phase, thirty one companies had indicated willingness to participate in the second phase, eight companies were not sure, while the rest were either not willing or did not indicate/ answer. Sixteen of the thirty one companies reported to have grown during the survey phase, and fifteen reported to have experienced growth deficit in the previous five years. Building from the survey phase I interviewed eleven companies, which is five extra from what the project required, to ensure a balance of factors: whether companies were growing or not; ensure a fair demographic representation amongst different companies , both components and the OEMs. The eleven companies consisted of those who reported to have shrunk (six from sixteen companies), and those companies who reported to have grown (five from fifteen companies) between the year 2014-2019. Unlike the survey phase, which explored the relationship between formal TVET programmes and inclusive growth and transformation;, I utilized the case studies (qualitative phase) to determine whether companies perceive the Technical Vocational Education and Training programmes (hereafter TVET) focusing on high skilled levels as more significant or whether there are specific programmes that are seen crucial and necessary condition with regards to growth and transformation. To solicit the company perceptions, I targeted three participants per company namely, the senior management (specifically, the HR directors), the production manager(s), and the organized labour representative(s). South Africa is the only country amongst six countries that interviewed trade union representatives because of the unique history of the country; the inclusion of trade unions in the mix of people to be interviewed assisted to triangulate the views.

4.6.4 Research Instrument

As indicated above, I implemented the same questionnaire that I, together with the project team developed for the project as a whole. The questionnaire(s) was developed and standardized for all six countries. Once, again in this process, I, together with the SA team, played an important role in

the design and development of the qualitative (case study) questionnaire, which had open ended questions, with addition of Likert scale.

We structured the questions to solicit company insights on the following broad range of issues: the pre-employment formal programmes that companies look for at the point of recruiting and hiring; whether or not companies provide in-employment training (formal or informal) at different levels of occupations; and whether or not they have their own training facilities or collaborate with TVET providers. Furthermore, to understand changes that have happened over the last five years in terms of technology, work organization and product change, and whether these changes necessitated more skills or visa-versa; and whether these changes have improved working conditions, performance of employees.

In addition, to understand whether or not companies had grown, to determine what role formal training programmes played in this? The last section was around specific programmes that are seen valuable for mid-skilled and high-skilled employees. The case study phase was conducted over two months between October and November 2019 across three regions in three provinces as mentioned above. The focus was on the specific contextual factors that have emerged as being relevant in the survey phase such as company embeddedness in global value chains or the relationship between TVET provision and sectorial industrial strategy.

The approach took into account the learning from the survey phase, in terms of the themes emerging from the contextual review, survey, and case studies, and is consistent with the skills formation literature in Chapter 3, which emphasizes the importance of the context political-economic context, industry, and industrial relations context, education, skills, and training system (Allais, 2015; Bosch, 2017; Maurer, 2011).

4.6.5 Process

Companies were sent interview invitation letters requesting interview sessions with the mentioned above personnel and they (companies) were allowed to freely choose date and time in a week suitable for them, and interviews were conducted according to the date and time agreed upon between the researcher and the senior management in the companies.

The maximum time for interviews was 1 hour maximum per participant. In total 33 personnel were interviewed in eleven companies which consisted of 11 trade union representatives, 11 production managers, and 11 human resource directors. I started the interviews in Gauteng, followed by the Eastern Cape and Kwa Zulu Natal.

Either before or after the session I would be taken on a plant tour to see exactly what companies were manufacturing. This tour would either happen when the session was for the human resource director or plant director, very rarely if it was the production manager and not at all with trade union representatives.

An important observation about the participants in terms of gender is that eleven of the thirty-three participants interviewed were females, and of that three were production managers, six were senior management (HR directors), and two were trade union representatives. Put it differently, six in eleven companies have females at the senior management level (human resources directors), two females were trade union shop stewards and three companies had females as production managers.

In terms of race, thirteen participants at senior management (HR directors) and production managers were Black people (Africans), while ten were White in both senior management. All trade union representatives were Black. As indicate in Chapter 1 the survey was carried out to determine whether formal TVET programmes help companies to grow and transform, or whether there are other specific programmes at a company level that are seen as important

in this regard. Furthermore, the survey was intended to determine the extent to which companies were gender inclusive in terms of wages and employment between the 2014 and 2019 period.

4.6.6 The Case Study Analysis

We, the South African team, conducted a workshop around qualitative analysis through the NVivo Software. This workshop was led by a software qualitative data expert from the PDG Consultant to help us understand how the software is utilized for qualitative analysis practically. I utilized the NVivo qualitative software analysis to code data according to the emerging themes, with regards to the perceived role of the TVET programmes on company growth and transformation. The NVivo workshop helped me to structure data according to codes and case classifications, which led to the emerging of various themes related to the study.

These themes are: general perceptions of TVETs, the company involvement levels and success factors; growth patterns, drivers of growth, implications for employment, and industrial policy; different forms of training at a company level; transformation patterns, drivers and implications for skills and kind of changes; work organization and product change, drivers, implications for skills and kind of changes. This qualitative data analysis computer software package (NVivo) was a relevant qualitative data analysis software to utilize when coding and analyzing big data.

The data was coded to the specific themes, which were already provided by the project team for all sectors, in addition to those added emerging from the sector findings. The case studies were undertaken to determine whether formal training programmes focusing on high skills were more significant than others and which specific skills programmes were seen as most relevant by companies in relation to growth and transformation.

4.6.7 Reliability and Validity of the Research

Reliability refers to the extent to which a scale produces consistent results if repeated measurements are made on the characteristic. Validity may be defined as the extent to which differences in observed scale scores reflect true differences among objects on the characteristic being measured, rather than systematic or random errors (Babbie & Mouton, 2001; Denzin, 2012; Neuman, 2006). When one is planning to carry out empirical research it is always advised and necessary to conduct a pilot study. The main aim of the pilot study is to examine the feasibility of the project and to avoid possible mistakes surrounding the operationalization process of the study.

The pilot study may be regarded as a small scale research project undertaken before a bigger research project to find out whether the sample size, data analysis, and research instruments are accurate (Babbie & Mouton, 2001; Creswell, 2002; Denzin, 2012; May, 2001; Mouton et al., 2013; Neuman, 2006).

The validity of an instrument, according to May (2001), refers to the extent to which that tool measures what it is intended to measure, whilst reliability refers to the degree of consistency of an assessment tool to produce stable results when applied in similar situations but different circumstances. As part of testing the reliability and validity of the research and for the project requirements, the survey (draft) instrument was tested or piloted through two companies and one trade union, and this process led to further revision and refinement of the survey instrument. The purpose of piloting was explained to the participants, and they were also asked to complete the questionnaire and provide their responses about the nature of the study, the structure and nature of questions, and whether or not in their view they thought the questions were user-friendly.

They all agreed that the language was clear and that the questions were suitable for an empirical study and could be easily understood. They also indicated that it would be good to explain certain concepts so that the answers were in line with the meaning of these concepts. This led to further revision and refinement of the survey instrument.

4.6 ANALYTICAL FRAMEWORK: THREE SET OF CONCEPTS IN DIALOGUE WITH EACH OTHER

Henning (2004) argues that at the end of a literature review it is important to create an alignment of the key and relevant concepts of the study. In this section, I briefly reflect key concepts I created as part of my analytic framework to understand the contribution of skills to company growth and transformation. These concepts are: occupational level; industrial growth and transformation, and different type of training.

Occupational level Concepts:

Mid-Skilled Employees (MSEs): employees whose occupation have an average wage in the middle of the occupation-wage distribution and are categorized as middle-skilled regardless of their education, training, or work experience. However, in this research, the MSE is utilized to refer to the first level of employees in production related jobs and processes. In other words, the MSE is utilized to refer to operators in the production process.

High Skilled Employees (HSEs): Skilled workers are part of the human capital, currently holding leadership/management, professional or technician/associate professional positions in companies. Highly skilled

employees are normally defined by advanced education (college and higher), possession of knowledge and skills to perform complicated tasks, ability to adapt quickly to technology changes, and creative application of knowledge and skills acquired through training in their work (International Labour Organization, 2014). This research defines HSE to refer to people or candidates who have college diploma or university degree, and the focus at this level is on artisans and or technicians who are located in the maintenance departments in companies.

Types of training:

I further utilized five different forms of training to understand their role in relation to industrial growth and transformation. These are: formal education institutional-based TVET training, and formal dual type of training also known as apprenticeship training, informal on-the-job training, and non-formal workplace based training, and secondary school-based training. In order to explore the role of formal training programmes, I needed to consider them in relation to general education programmes (secondary school training) as well as non-formal and informal training.

Two of them are types of formal training programmes, which my study is interested in; one is formal education-based programme, not training; and the others are non-formal and informal training. I have created these key concepts into a relationship with each other to understand the extent to which they contribute to industrial growth and transformation. As the literature reviewed in Chapter 3 has shown, formal institutional training is formally structured and intentionally planned, and leads to a formal qualification. Non-formal workplace training, as indicated in Chapter 3, is about development of the company through contributing in the production, effectively and innovatively;

and also the development of employees through enhancing their knowledge and skills.

It is seen as useful by companies because candidates or employees who undergo non-formal training are often utilized by companies to induct new employees into the culture of the company. The formal dual type of training, also known as apprenticeship training, is a training in which an apprentice acquires the skills for a trade in the working environment, trained by an experienced craftsperson, and often complemented by classroom-based instruction (International Labour Organization, 2012; Misko, 2008; Mohrenweiser & Backes-Gellne, 2010; Mulder, 2018).

As literature discussed in Chapter 3 has shown, this type of training is different from other formal training happening in formal education institutions because apprentices are attached to the company, and spend a significant amount of their time in the workplace. Informal on-the-job training which takes place on the job is company-specific and linked to new machines and is often provided by companies to employees on the job. As explained in Chapter 3, this training is conducted intentionally but is not institutionalised, being less organized and less structured.

The literature reviewed in Chapter 3 shows that the school-based training gives candidates basic skills that they need for entry in the world of work. These skills are seen as crucial by employers i.e., reading and writing skills, and communication skills. I have created these different concepts into a relationship with each other to understand growth and transformation as part of my analytic framework to understand the contribution of skills to company growth and transformation.

4.7. ETHICAL CONSIDERATIONS

Chadwick et al. (1984) argue that ethical considerations in social research are important for any research taking place, and as the principal researcher I was

conscious of ethical issues in the study. Neuman (2006) argues that, in any social inquiry, it is the researcher's responsibility to protect the participants during the research process and this was consistently adhered to. Rubin and Babbie (2005) argue that participants do not spontaneously volunteer to participate in the study, they are asked to participate. Although participants voluntarily participate in the study, they need to be protected from any harm that may arise because of their participation (May, 2001; Neuman, 2006; Rubin & Babbie, 2005; Vine, 2009).

In research, participants can be harmed in different ways, for example, if they are asked to reveal embarrassing information about themselves or if their answers are published. If the researcher fails to keep the information of the participants confidential, it can become an ethical problem (Neuman, 2006).

As part of adhering to the ethical code of conduct, the application for ethical clearance was submitted and granted by the University of Witwatersrand ethics committee, and the Wits University human research ethics committee (non-medical) ethical clearance number is R14/49. I undertook several steps to minimize or prevent ethical problems while conducting this study.

Participants' permission was requested both verbally and in writing, and after reading the consent form the participants signed to show that they understood their rights in the process of the study and what their contribution entailed. The evidence and proofs of all these documents are found in the appendices section in Chapter 9. In addition, the industry associations and companies were also informed about the research, and a request for their support and participation was sought and granted.

I have carefully and consistently endeavoured to follow ethical research procedures, and participants were made aware of their rights to participate and also that they had a right to withdraw at any time if they felt to do so and this was also explained to them. For the survey, ID codes were generated that

were unique for each company and these were utilized instead of company names to guarantee confidentiality and anonymity. In the findings presentation and analysis chapters - particularly Chapters 6, 7, and 8, I use pseudonyms in the form of ID codes for participants. The participants were assured that the research would not result in unfair use against them. They were made aware that the study was a university project and data would only be used for this research project, and this includes the research reports and knowledge management products.

They were also informed that the research team would take full responsibility for all the raw data collected by storing it safely in a lock-up cupboard at the Centre for researching education and labour (Wits-REAL). All electronic data would be stored on a laptop in a password-protected folder. The password would only be accessible to the project team. All raw research data would be carefully stored away in a lock-up cupboard. This data would then be destroyed 5 years after the completion of the project, and all the hard copies be shredded and all electronic files deleted.

CHAPTER FIVE: INSIGHTS FROM SURVEY FINDINGS IN THE AUTOMOTIVE SECTOR

5.1 CHAPTER OVERVIEW

This chapter presents key findings from a survey conducted in the automotive sector in South Africa. The main findings are that formal skills are not perceived by companies as a driver of industrial transformation and growth. There is a relationship between formal skills and growth, as companies that report growth express a greater need for formal skills.

The survey was also able to create a more nuanced picture of the relationship of formal programmes to meeting companies' skills needs, showing that senior secondary education (called the 'matric' in South Africa) is a prerequisite for hiring mid-skilled employees (MSEs), also referred to as operators, but it is not contributing to meeting company skills needs; that formal vocational education programmes at higher skilled levels (HSE) are valued by companies as meeting their skills needs (in specific trade tests and engineering diplomas); and that it is also at this level where companies report greatest skills gaps, which negatively affect company operations, and to a lesser extent growth.

The survey shows that although women's participation has somewhat increased, which signals a move towards gender inclusivity, there has been a slow pace of participation by the previously disadvantaged groups at higher skilled levels. Finally, in the survey, I did not ask about in-formal and non-formal training. Nonetheless companies mentioned non-formal training frequently, suggesting that it is very important to them and contributes to skills needs at various degree.

5.2 SKILLS DYNAMICS AT A COMPANY LEVEL

There seem to be trends in all surveyed companies that there are no major skills problems at mid-skilled employee (general work and operator) level. Companies start to report skills problems at a higher skilled employee's level, which affect company operations. I discuss the company-level dynamic in detail in this section and show which questions this section addresses. The first survey question asked if companies encountered difficulties in finding employees who met their skills requirements between 2014 and 2019. The second survey question asked those who encountered skills difficulties, whether those difficulties affected company operations (functioning of the company) and growth.

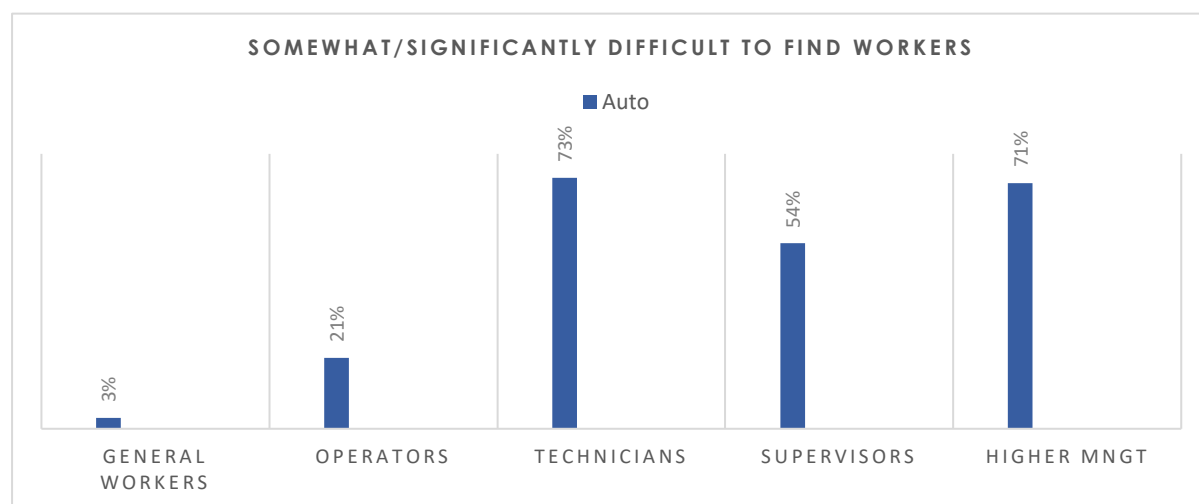
5.2.1 Skills availability

It shows that 73% of companies had no major skills problem at MSE level, although 3% report some difficulty in finding general worker skills, and 21% report some difficulty to get operator level skills. When it comes to HSE level, which is artisan- or technician's skills, supervisors, and higher management, companies start to report significant difficulty in finding these skills. And **Error! Not a valid bookmark self-reference.** b shows that of 61 companies, 73% of them report difficulty in finding technicians/artisans, 54% report they could not find supervisors, and 71% report difficulty in finding necessary skills for higher management.

Figure 5 below shows company responses about skills availability or lack thereof. It shows that 73% of companies had no major skills problem at MSE level, although 3% report some difficulty in finding general worker skills, and 21% report some difficulty to get operator level skills. When it comes to HSE level, which is artisan- or technician's skills, supervisors, and higher management, companies start to report significant difficulty in finding these skills. And **Error! Not a valid bookmark self-reference.** b shows that of 61 companies, 73% of them report difficulty in finding technicians/artisans, 54% report they could not

find supervisors, and 71% report difficulty in finding necessary skills for higher management.

Figure 5: Skills Availability in the sector

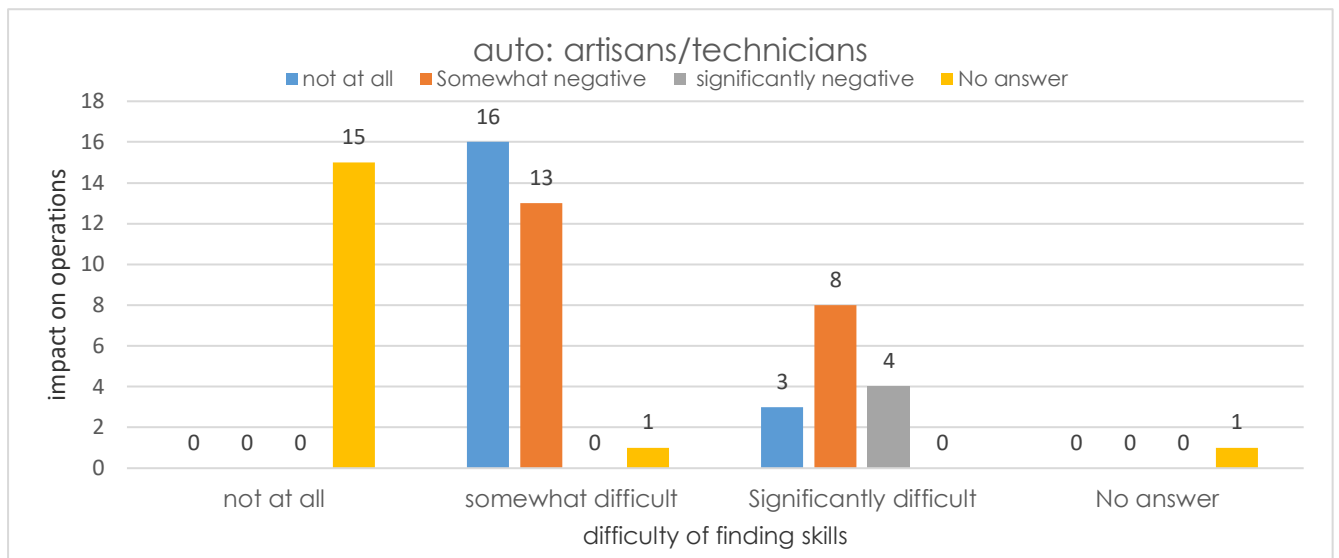


The survey findings show component suppliers to be the most affected by the skills shortages, and OEMs to a lesser extent. A possible explanation for the OEMs not reporting major skills problem could be that they have accredited training academies and spend millions running training programmes in-house.

5.2.2 Effects on Company Operation and Growth

This section explores whether those companies who report skills shortage see this shortage as having affected company operations. The emerging trend across companies is that skills shortages at HSE level affect company operations. Figure 6 below shows the responses of companies concerning the effect of shortages of technicians on company operations. It shows how shortage of technicians affects company operations and growth. Figure 6 shows that of the 45 (73%) companies that report difficulty in finding artisans/technicians, 25 (55%) of them report this difficulty has affected company operations. It is only 19 (42%) of the 61 companies that report that skills shortages had no negative effect on operations, and the last 17 (28%) of the 61 companies did not answer the question.

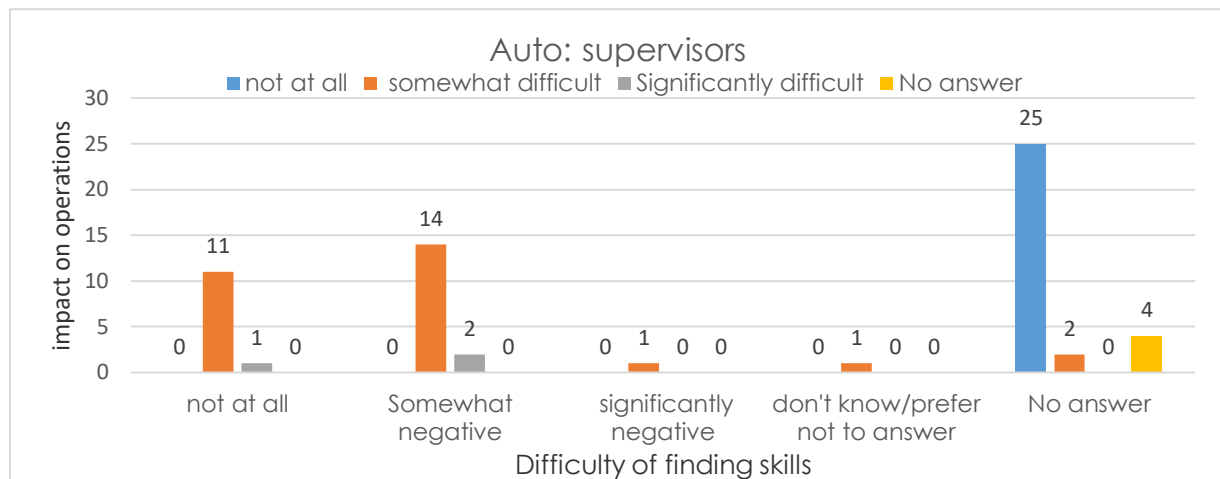
Figure 6: Effect of lack of technicians on operations and growth



These findings are consistent with the research commissioned by policy bodies (reviewed in Chapter 2) that suggested that industry as a whole has a serious technical skills problem (Automotive Supply Chain Competitiveness Initiative, 2016; MerSETA Sector Skills Plan, 2017). The skills shortage at a higher skilled employee level is not reported as having an effect on company growth. The survey results show that of the 45 (73%) that reported artisans' skills shortage, 27 (62%) companies report that did not affect company growth. Only 13 (6%) companies in the same pool report that artisans' skills shortage impact company growth negatively. The remaining companies did not answer the question.

Figure 7 below also shows that a shortage of supervisors has a negative effect on company operations. It shows that 32 (52%) of the 61 companies report difficulties in finding supervisors, and this has significantly affected company operations, although 25 (41%) show that skills shortage has no effect on operations, and 4 companies (7%) have not answered the question.

Figure 7: Shortage of supervisors has negative effect on company operations



When it comes to the relationship between shortages of supervisors and company growth, the results show that 29 (47%) companies did not answer the question. Only 32 companies answered the question of skills effect and growth, with 25 (41%) reporting that shortage of supervisors did not affect growth. Only 7 (12%) companies reported the shortage of supervisors affects growth negatively. When it comes to higher management, the results also show that of 43 (71%) companies that report difficulty to find higher management, 29 (47%) report that skills shortage do not affect growth, while 14 (23%) report that lack of higher management affects growth negatively, and 18 (30%) companies did not answer the question.

5.3 FREQUENT FORMAL PROGRAMMES AT VARIOUS LEVELS

In this section, I show different formal training programmes that employees at various levels have acquired pre-employment, which relate to both formal training and secondary school-based training discussed in Chapter 4 as my analytical framework for this study. I further discuss the dominant forms of training for existing employees, which companies frequently mentioned as being non-formal training, suggesting that it is very important to them and contributes to skills needs to various degrees and relates to one of the key concepts of the analytic framework explained in Chapter 4.

5.3.1 Training Programmes for MSEs

Figure 8 below shows that both general workers and operators had formal matric certificates pre-employment.

Figure 8: General Workers and Operators

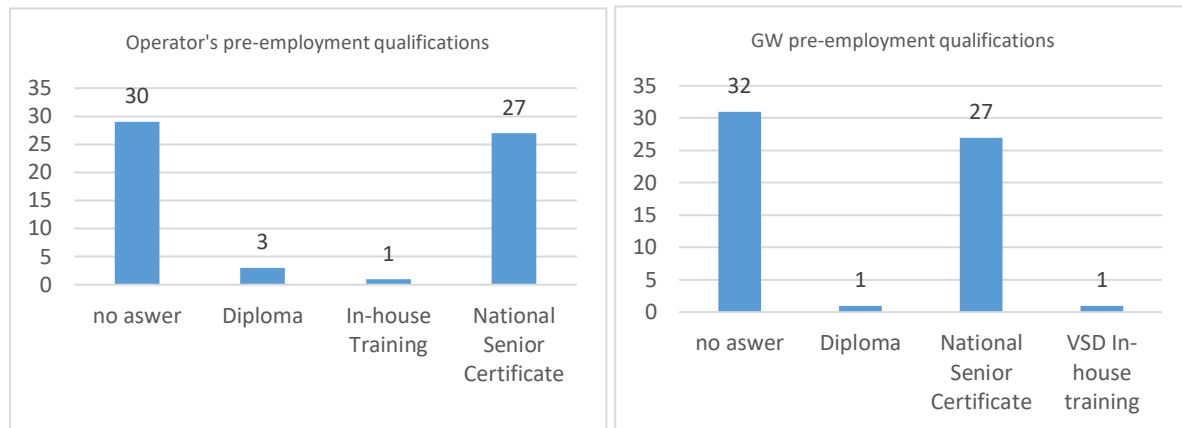


Figure 8 shows that 30 (49%) companies did not answer the skills programmes that operators had pre-employment. Those that answered, which is 27 (44%) companies, reported the matric certificate (the senior secondary school certificate in South Africa) as the most frequent skills programme for operators, whilst 3 (5%) companies indicated that their operators had a national diploma, albeit without mentioning a specific field. Only 1 company reported to have trained their operators through in-house training and did not mention the prerequisite for in-house training. On the other hand, 32 (52%) companies did not answer the skills programmes for general workers, and those that answered, which is 29 (47%) companies, reported general workers had the matric certificate. The matric certificate—senior secondary schooling—may be preferred at both these levels because it signals the ability to read and write, to follow instructions and appears to be enough for employability at this level.

This finding is consistent with the literature reviewed in Chapter 2 that the OEMs now prefer candidates who have passed matric with mathematics and

science on the production line because they are able to read and write and easily trainable (MerSETA, 2018). Despite the weakness of the South African education system, notwithstanding higher expenditure as the literature has shown in Chapter 2 (Ngozo & Mtantato, 2018), companies still use the national senior certificate as a base for employment.

In terms of in-employment training, the survey shows that mid-skilled employees (MSEs) once employed undergo different types of training which are seen as crucial and relevant for companies in the context of workplace technological changes. All these forms of training which happen in the workplace are: non-formal company training; informal on-the-job training; induction training; and dual type of training, in particular learnership training. These types of training happen in-house and don't lead to a formal qualification, except formal dual type of training (learnership programmes). Companies often offer these types on training in the workplace when they are struggling to find the requisite skills, and also to build internal capacity.

Non-formal training, for instance, helps companies to address skills needs at a general worker and operator level. This finding responds to the third question addressed in Chapter 1, which reads: *Do formal pre- and in-employment training programmes help companies regarding skills needs?* The findings suggest that company-based training is important at this level and contributes to company level skills needs.

The company-based training is seen as crucial given the technological changes in the production line. The survey shows that this type of training is seen crucial for operators to understand how to set and effectively operate the machine, and in general how the machine works. It is also enhance employees' basic skills such as numeracy and literacy.

The survey further shows that in some instances, especially when there is no internal capacity, companies collaborate with private training providers, not

with TVET colleges, to offer necessary company training specificities, which is often informal.

Non-formal types of training, which as indicated are company-based and don't lead to formal qualification, seem crucial as companies are more involved in this type of training. Company involvement in vocational training, although in a non-formal way, appears important in shaping how skills are developed.

5.3.3 Training for Supervisors

Just over half of the sampled companies, 31 (51%), did not answer and 30 (49%) reported qualifications that supervisors held pre-employment. Twenty (33%) companies reported that supervisors held various formal training qualifications such as diplomas in fields like logistic and purchasing management, operations management, and production technology management pre-employment, while 9 (15%), reported supervisors had a matric certificate, and 1 (2%) company just indicated that supervisors had a university degree, which in my analytic framework is referred to as a formal training.

The in-employment training for existing supervisors' targets leadership and management skills, supervisory development training, which is seen as a formal skill as it is acquired from universities, standard operating, and procedure training, which is in-house. In addition, those who were recruited with matric have enrolled and graduated with qualifications like a national diploma in logistic and purchasing management, national diploma in operations management, and production technology management, all of which are referred in my analytic framework as formal training skills.

5.3.4 Training for Artisans and Technicians

Artisans/technicians are critical higher-level employees and play an important role in the maintenance side of the value chain. As a result, a trade test, which is a formal dual type of training, is a requirement for artisans and to lesser extent

technicians. The findings show that artisans have had both formal dual training and formal education institution-based training in the following programmes: pre-employment, tool and boiler making; electrical, industrial, and mechanical engineering; millwright engineering; autotronics and mechatronics; and fitter and turner qualifications, which are also consistent with analytic framework. These types of skills help companies to address skills needs. This finding responds to question number three addressed in Chapter 1, which reads: Do formal pre- and in-employment training programmes help companies regarding skills needs? The finding shows that formal training pre-employment and formal-dual type of training is crucial and contributes to company level skills needs.

On technicians, just over half of the surveyed companies (51%) reported that their technicians have a national diploma in various engineering courses and 26% require technicians to have trade test, and 13% of companies reported that their technicians have undergone formal dual training internally. However, medium component suppliers seem to require experience as an additional criterion for pre-employment for technicians.

In-employment training that HSEs undergo includes artisan's experiential learning; bearings and hydraulics training; core tools and quality/systems; machine setting and handling equipment; maintaining production equipment; training in maintenance planning and scheduling; P1 & P2 training; and technical training on robotics. This type of training which happens at a company level as I have indicated above shows the importance of company level involvement when it comes to skills provision as discussed in the literature reviewed in Chapter 3 (Bosch, 2017; Porter, 2003). This in-employment training helps HSEs to cope easily with new machines and it prepares artisans and technicians for greater international effectiveness and competitiveness as they utilize advanced equipment.

5.4.5 Training Programmes for Senior/Higher Management

The formal education, institution-based training, as discussed in the analytic framework, fits the type of skills that higher management have acquired pre-employment in the automotive sector. Higher managers lead different divisions or departments in the company, and the survey shows that they had university degrees or national diplomas pre-employment, and these programmes at this level contribute to skills needs. This finding responds to question number three addressed in Chapter 1, which reads: Do formal pre- and in-employment training programmes help companies regarding skills needs? The findings show that formal training at a higher management level is crucial and addresses company level skills needs. For instance, at a maintenance department, high management is recruited with the following areas: electrical, industrial, mechanical, engineering, computer science degree; while senior managers in other departments (either logistics or production) have had a diploma in operations and production management and various management development programmes prior-employment. In addition, experience in previous or similar positions is crucial at this level. Managers have also undergone non-formal training in labour law training workshops, legislative policy workshops, induction, safety, and occupational health and safety training.

5.3.6 Key Leading Institutions in the Sector

In this section, I show leading institutions that various employees have graduated from before joining the companies. These are institutions from which companies have mentioned recruiting employees, thus, it could be argued that these institutions are skills feeders particularly in technical fields such as engineering. The institutions range from universities, technical colleges,

and universities of technology as well as independent industry training providers that work with the automotive sector. Figure 1 below lists these various institutions.

Figure 9: Feeder Institutions to automotive companies

Occupations	Institution
General Workers	Basic Education (school system)
Operators	Basic Education (school system)
Supervisors	University of South Africa Port Elizabeth Technical Vocational Education and Training Tshwane University of Technology Project Management Institute Nelson Mandela University Business School Durban University of Technology B+M Analysts
Artisans and Technicians	Port Elizabeth Technical Vocational Education and Training (Iqhayiya/Straundale Campus) Tshwane University of Technology Toyota South Africa Motors Nelson Mandela University Witwatersrand University Volkswagen Training Institute University of Technology Nuclear Energy Corporation of South Africa MerSETA Training programme College of Cape Town

	Gijima Training Academy
Higher Management	Damelin College, University of Stellenbosch Wits Technikon (now part of the University of Johannesburg), Rhodes University Durban University of Technology Tshwane University of Technology Project Management Institute Nelson Mandela University Commercial Training Institution

5.4 INDUSTRIAL TRANSFORMATION

In this section, I report on company-level transformation to show that skills are seen as crucial in the context of technological changes, work organization, and product change.

5.5.1 Changes in technology

This section responds to the first research question discussed in Chapter 1: To what extent do formal TVET programmes contribute to company growth and transformation? The survey shows skills are not the key drivers of industrial transformation. Skills are crucial when these changes in technology, work organization, and products have taken place.

This implies that there are underlying factors that shape or influence the contribution of skills to company growth and transformation, and these will be discussed in Chapter 7 and Chapter 8. The introduction of new technology, and demand for new skills suggests the importance and existing relationship between skills and transformation. This could be the reason why companies invest in reskilling of employees in all occupations through non-formal company-based training.

Figure 10: Changes in Technology

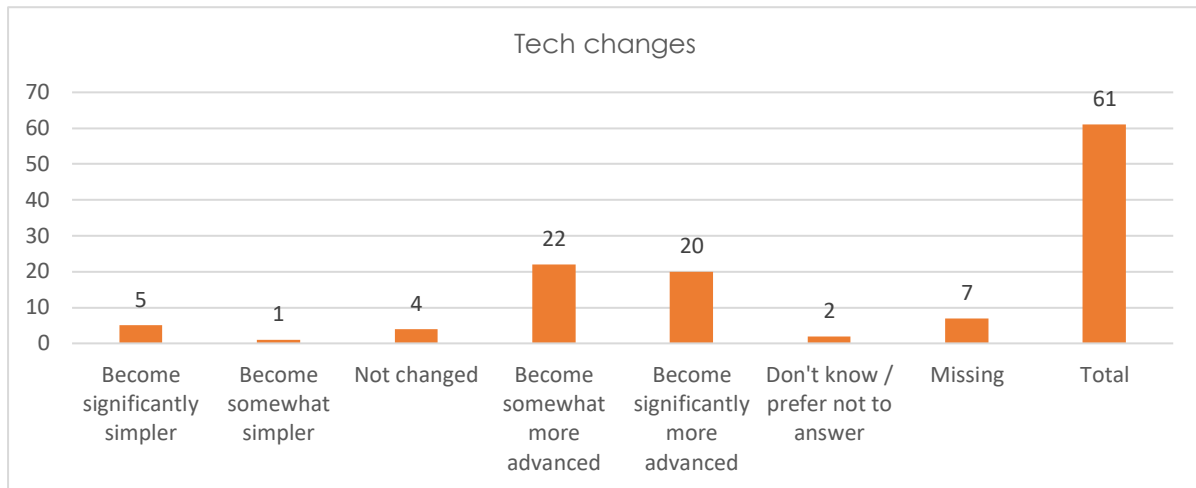
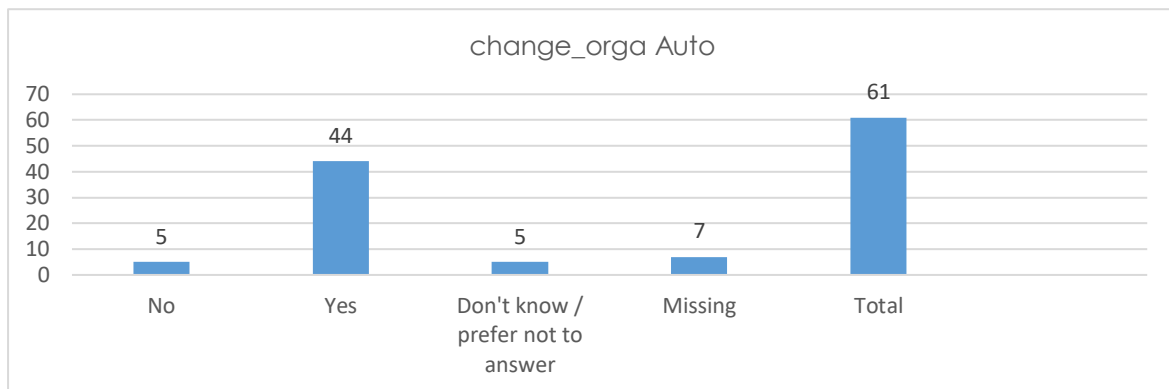


Figure 10 shows that of the 61 companies, 42 (68%) reported that the technology has become advanced (meaning they have introduced new technology in the production line), while 6 (10%) companies reported that technological changes have become significantly simpler to use. Only 9 (15%) companies did not indicate whether there have been technological changes or not, while 4 (7%) companies reported that their technology has not changed. The findings are in line with Chapter 2 that technology is not only about amplifying production but is also crucial to maintain global standards in terms of competitiveness (Barnes et al., 2018). Essentially, the findings suggest the importance of skills in the context of transformation at a company.

5.5.2 Changes in work organization

There have been changes regarding work organization. Companies report having restructured and re-organized their production management. Figure below shows company responses in relation to the work organization. It reveals that of the 61 companies, 44 (72%) report to have restructured work organization, while 5 (8%) did not answer the work organization question; this is in addition to 7 (11%) companies that did not choose any available option, are shown as missing in the graph.

Figure 11: Changes in Work Organization



5.5.3 Changes in Products

Company products have become significantly more advanced. Figure 12 below shows the varying extent to which company products have changed.

Figure 12: Changes in Products

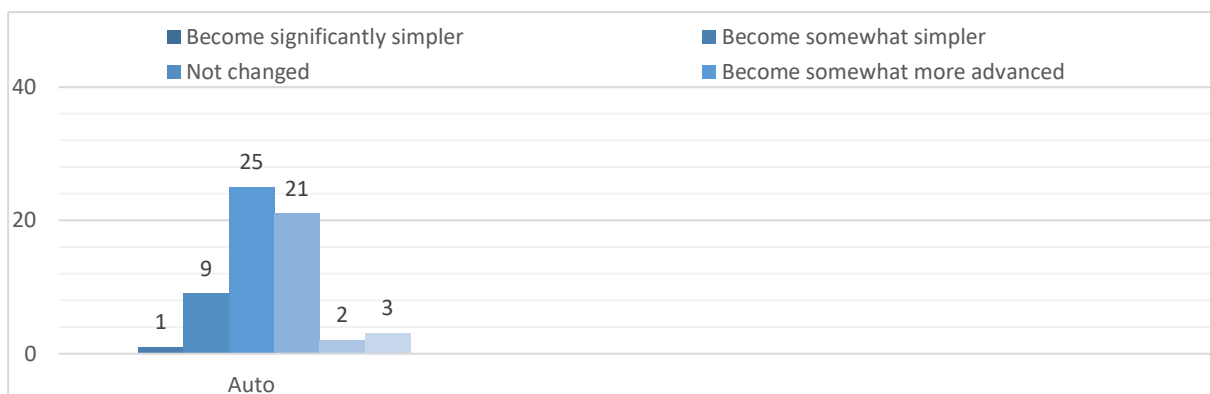
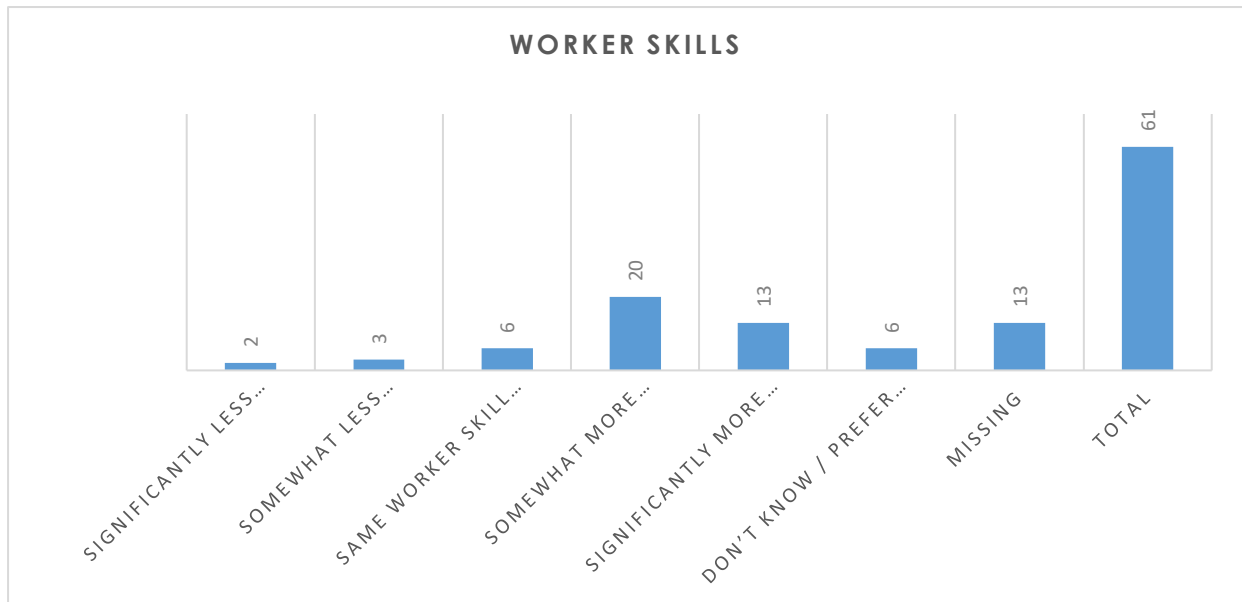


Figure 12 shows of the 61 companies, 25 reported that products have become somewhat more advanced, whilst 21 companies believed that products have become significantly more advanced, both of which make a total of 46 (75%) of companies whose products have advanced; 1 (2%) company said that its product changes have become simpler, and 9 (15%) companies reported no product change at all. Only 3 (5%) companies did not choose any answer option and the other 2 (3%) companies did not share their product change status. Again, although Chapter 7 will give more details on this, it could be speculated that technology changes have influenced product change as

well, either to be more advanced or simpler. Figure 13 below shows that 33 (54%) companies report that changes in terms of technology have required skills, and this could be why companies prefer formal training programmes, and also invest in upskilling programmes.

Figure 13: Changes in Worker Skills



Skills utilization has also been essential in work organization changes, which seem to have been influenced by technology, which appears to be central in the production line. Product changes that have also been influenced by technology had also demanded new skill set.

While 17 (28%) companies did not answer, the remaining 11 (18%) companies had different following responses: Five companies reported that changes in technology demanded few worker skills and 6 companies reported the same worker skills as before. The advanced skills requirement finding is consistent with the literature reviewed in Chapter 2 which sees these as critical to stay level with global competition, and seems crucial for workplace changes (MerSETA, 2018).

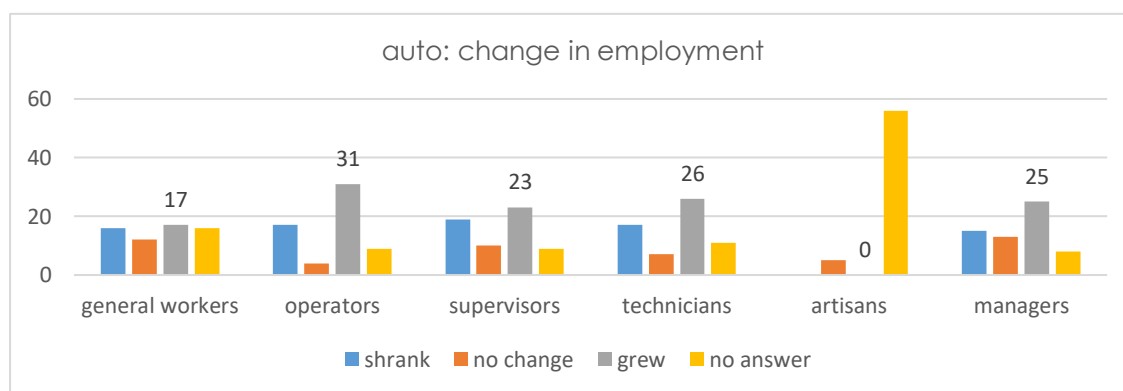
5.5 COMPANY GROWTH PATTERNS

This section responds to research Question 1 discussed in Chapter 1: To what extent do formal TVET programmes contribute to company growth and transformation? Focusing on the relationship between formal TVET skills and industrial growth, the survey shows that skills do not drive growth. The survey shows that growth in employment, which has somehow been inclusive, requires formal skills. However, there has been a slow pace of growth for historically disadvantaged persons.

5.5.1 Changes in Employment

The findings show that levels of employment have grown across occupational levels. As **Error! Reference source not found.** below shows, employment growth has been more noticeable for operators and technicians, which means more candidates with matric certificates and those with engineering diplomas and trade tests have been employed. The increase suggests the crucial role that operators in the production line and technicians at the maintenance play in various companies. For operators, companies report that they have increased to 15,624 in the last five years and technicians/artisans have increased to 4,553.

Figure 14: Employment Changes



Error! Reference source not found. demonstrates employment changes, which are more pronounced at operator level than any other category, followed by technicians, high management, and supervisors. The increase in employment is seen as consistent with the literature reviewed in Chapter 2, that industry as a whole showed employment increase in a space of three months between September and December 2019 (NAAMSA, 2019). More broadly, the steady increase in employment over the years as discussed in Chapter 2 is attributed to the resilience of the industry, growth, and investment ventures to sustain employment growth (Claassen, 2014; Lamprecht, 2009; NAAMSA, 2012).

Figure 15: Changes in Wages and Salaries

	General workers	Operators	Supervisors	Technicians	Higher management
Declined more than 33%					
Declined less than 33%					
Not changed	1				
Increased less than 33%	12	12	15	15	18
Increased more than 33%	12	11	12	9	7
Don't know/prefer not to answer	8	7	7	7	7
Missing	28	31	27	30	29
Total	61	61	61	61	61

Error! Reference source not found. depicts the varying salary increment in various occupational levels. Although **Error! Reference source not found.** shows that 36 companies did not answer the salary question, the remaining 25 companies reported a salary increase across the employee categories. Of the

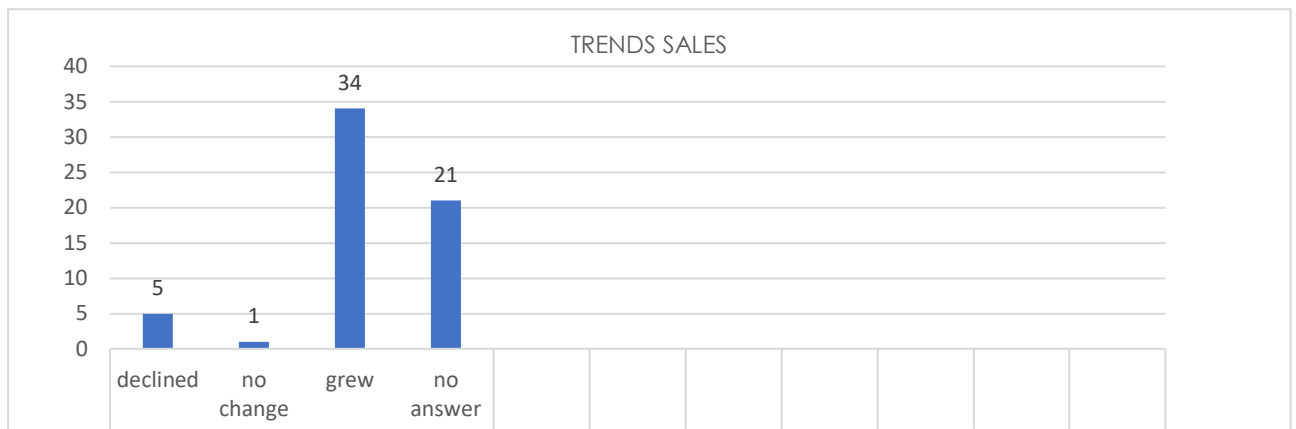
25, 15 companies reported that salary increases had been less than 33%, whilst 10 companies revealed that their salary increase had been more than 33%. This finding is consistent with the literature reviewed in Chapter 2 that salary increment is inevitable when there has been an employment increase as a consequence of company growth (The Automotive Industry Development Centre, 2017).

5.5.2 Changes in Sales and Exports

Sales and exports also surged in the period between 2014 and 2019, which was a period before the COVID-19 and this was revealed by 48 (78%) companies. The remaining 13 (22%) companies did not answer the sales and exports question. Of the 48 that answered, 35 (73%) companies reported to have increased their exports between 33% and 66%, and 13 (27%) companies reported an increase in exports of less than 33%. The export increase is consistent with the literature reviewed in Chapter 2 that an inevitable demand from the trading partnerships improved export performance (MerSETA, 2018).

Error! Reference source not found. below shows that of the 61 companies, 34 (56%) reported increases in sales. On the other hand, 5 (8%) companies reported a decline in sales, with only one (2%) company reporting no changes with regard to sales, and 21 (34%) companies did not answer the sales question. This is also expected, as discussed in the overview of the sector presented in Chapter 2, which shows a strong industry growth (Barnes et al., 2018; Lamprecht, 2009). The results seem to be consistent with the employer association projection; this is despite the VAT increase in the year 2018.

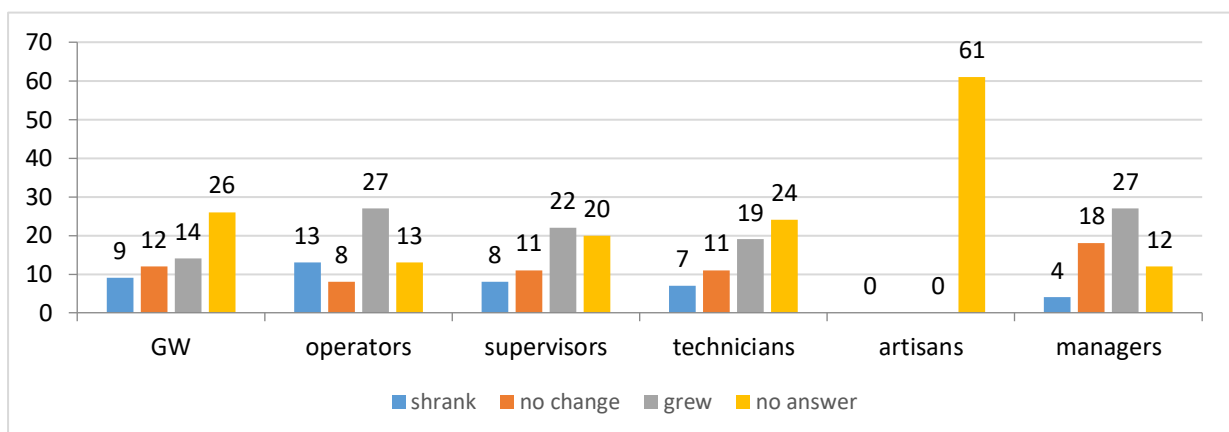
Figure 16: Sales Increase



5.5.3 Economic Inclusivity in the Sector

Error! Reference source not found. below shows companies have increased women's participation in the last five years, although historically disadvantaged persons have increased at a slow pace. Although not shown on the graph, of the 61 surveyed companies, 47 (77%) did not answer the historically disadvantaged persons question; It was only 14 (23%) companies that reveal an increase in participation.

Figure 17: Gender Inclusivity in the sector



Error! Reference source not found. demonstrates that a woman's participation has increased in all categories of employees. The increase of women is more pronounced for operators and supervisors, with the remaining companies either reporting no change or to have shrunk or did not answer the question.

Through these results, seems that the company level growth has been inclusive in the sense that there has been a general increase of historically disadvantaged people (mainly Black), and women's employment has increased too. Consistent with the literature review in Chapter 2, this is a significant stride in the sector, given that in the past development of the industry was seen as critical to ending White poverty, thus mostly Whites were employed (Barnes, 2013). The redress driven in the workplace as the survey reveals is a consequence of affirmative action also referred to as employment equity transformation.

5.6 CONCLUSION

The chapter has shown that at an operator level skills are less difficult to find, and reveals that evidence of skills difficulty starts at an artisan or technician level. It further showed that skills shortage affects company operations to a lesser extent when it comes to growth and transformation.

Despite companies' struggles to find artisans and technicians, they grow in terms of employment, sales and exports, and introduce changes in technology. The chapter further revealed the importance of formal qualification pre-employment and formal dual training, both of which contribute to company skills needs at a higher level.

Furthermore, non-formal training is also helpful for company skills needs. Thus, consistent with literature reviewed in Chapter 3, the chapter confirms that the notion of supply and demand with regards to skills is more complex, and challenges the South African formal TVET provision designed at the national level to be re-examined. The survey findings seem to suggest that there are other crucial indicators that play an important role in driving growth and transformation, not skills.

CHAPTER SIX: DOMINANT FORMS OF SKILLS TRAINING IN THE SECTOR: ANALYSIS FROM THE CASE STUDIES

6.1 CHAPTER OVERVIEW

In this chapter, I present an analysis of the dominant forms of training emerging from the 11 company case studies. I start by presenting the case studies showing the following features: company descriptions; company dynamics and characteristics; structure of the workforce per company; dominant forms of training required for mid-skilled employees (MSEs) and high-skilled employees (HSEs) pre-employment; and dominant forms of training for MSEs and HSEs for existing employees.

I categorize these cases according to positive growth and negative growth, and I commence with the companies that reported to have grown, which is a mixture of original equipment manufacturers (OEMs) and component suppliers. I then follow with those component suppliers that reported to have shrunk in the period under investigation, 2014-2019. Although in Chapter 4 I said am using company IDs for confidentiality and anonymity purposes, consistent with the project as a whole, I am now going to number the companies in numerical order for easy reference for the reader. I will still bracket the company IDs.

In this chapter, I further show that there are variations in how companies perceive TVET qualifications. In addition, I show that despite dominant forms of training at various levels, in addition to formal qualification, companies, especially component suppliers, do report shortage of skills at HSE level, and there are many reasons associated with this.

6.2 FEATURES OF GROWING COMPANIES: ORIGINAL EQUIPMENT MANUFACTURERS (OEMs)

Company 1: Growing OEM (ID: SA6D165)

Company description:

Company 1 is a foreign owned car manufacturer in South Africa with its head office based in Germany. Like all other OEMs in South Africa, Company 1 is located in the industrial area which also has many component suppliers in the surroundings, and a Public College close by. Company 1 has advanced technology, which it changes every five/six years. The company exports most of its products, although it also supplies many cars in the domestic market (South Africa). It is expanding its market base beyond the borders of South Africa and having a footprint in the continent they reach to other African countries, mainly Kenya and Nigeria. This company reported to have shrunken during the survey phase in terms of sales and exports, and products.

Company dynamics and characteristics:

Age: 1946

Size: 5,600 employees

Sales and export: These have grown in the last five years

New tech, products, work organization: Yes, the company has made changes

Structure of workforce

The company has different levels of operators, namely, assembly operator, body shop operator, and press operator at the production level. Their responsibility differs according to their tasks/functions. There are semi-skilled operators, which are classified as spotters or ding-man; they are more skilled than general operators, and the semi-skilled operators can do repairs on the vehicle. The company pays operators according to the skill they have, not according to the jobs they do.

It tests skills level through its automotive manufacturing industry framework. The second occupation after operators is the supervisor, whose responsibility it is to oversee a group of operators on the shop-floor, and the supervisor reports to the group leader, which is the third level in the production, tasked to oversee the function and tasks of all employees in the operation. Artisans, technicians, and engineers fall under the maintenance department, responsible for fault finding and maintenance of the equipment. There are managers per department and divisional heads.

Company 2: Is another growing OEM (SA9B7)

Company Description

Company 2 (SA9B7) is another foreign-owned car manufacturer in South Africa, with its head offices in Germany. It too is located in the industrial areas in Gauteng province, surrounded by component suppliers. The company is also exporting to the United State of America (USA) markets, although Mexico seems to be a major competitor for the USA market. It supplies locally as well, and has also introduced robots in the production line. There is a TVET College not very far from the company. This is in addition to other educational institutions in the city namely the University of South Africa (UNISA), the Tshwane University of Technology (TUT), and the University of Pretoria (UP). Company 2, reported to have shrunken in the survey results in terms of product demand because of the global dynamics, and this led to the company losing one of its car models, and the market share dropped significantly, especially in the USA. This was because of the USA's neighbour Mexico also supplying the same model to the USA and more cheaply than South Africa, thus the stagnation in terms of demand.

Company dynamics and characteristics:

Age: 1960

Size: 2,570 employees

Sales and exports: Grown

New tech, products, work organization: Yes, there have been changes in this regard.

Structure of workforce

Company 2 has various levels of employees, and the entry-level is operator level. Operators are called assemblers, online associates or process supporters. They are referred to as unskilled although they are recruited with matric. The company then conducts a skills test to assess if they can read and write. Operators work on the shop floor assembling cars and ensuring the smooth running of the plant operations at the lower level. A supervisor is the next level after assemblers or operators, and are classified as team leaders or process leaders, responsible for the supervision and overseeing of the team of operators in the production line.

In the maintenance department, the company has artisans and technicians who are referred to as auto skilled functions. They are also referred to as offline technical associates responsible for machine breakdown and running of the systems in the plant. They are further responsible for car diagnosis, reworking, or repairing cars and they all have team leaders responsible for them, referred to as foremen. There are also production engineers who differ according to their functions or tasks, i.e., process planning engineers, quality engineers. They are classified as a specialist. The production engineer is responsible for leading the company management strategy to ensure that it is followed at all levels.

The company then has a leadership role or management which differs according to the sections or unit in the plant. The different managers i.e., production managers, are responsible for the production operations, and all engineers, supervisors, and foremen in the production report to the production manager who ultimately reports to the managing director of the company.

6.3 DOMINANT FORMS OF TRAINING REQUIRED FOR MSEs and HSEs FOR PRE-EMPLOYED IN THE OEMs

Both OEMs, Company 1 and Company 2 prefer matric certificate with maths and science subjects for MSEs (operators), which is perceived as important in helping candidates to read and write. There is variation in how the companies perceive TVET qualifications. Company 1 reported that TVET training is a big problem for them because of the perceived poor quality, although it also reported to have collaborations with the College which is close by. The notion of poor quality of college graduates was also affirmed by the union representative from Company 1, although acknowledge their importance. The union rep indicated that TVETs don't develop the curriculum themselves, it is a task done by the DHET, and for the union this is a major problem because some of the elements are not practical in the workplace. On the other hand Company 2 seemed to have no problem with TVET-based training, although it didn't report any candidate recruited from any of the colleges in the last five years.

For high skilled employees (HSEs), these two companies require a formal university-based engineering qualification, with industry related experience as an addition requirement. In this regard Company 1 recruited HSEs from Nelson Mandela University, and Company 2 preferred Universities of technology, and recruited HSEs from Tshwane University of Technology.

The Tshwane University of Technology seems to be critical for MSEs at Company 2, although the union from Company 2 is not happy with the recruitment

process of the company, reporting that it is race-based. The unionist indicated that MSE is mainly dominated by the Africans, whilst HSE is dominated by Whites, Coloured and Indians.

The union reported that:

It's not that Black African people don't apply or qualify through meeting job requirements specifications, but they compete within the main White people who in many instances don't meet the requirements and get the job, that makes us unhappy. (Interviewed on the 7th October 2019)

Company 2 also recruits unemployed youth, mostly with matric certificate in maths and science, and trains them on various learnership programmes, and some of them get recruited by other OEMs, even component suppliers.

6.4 DOMINANT FORMS OF TRAINING REQUIRED FOR MSEs and HSEs FOR EXISTING EMPLOYEES IN THE OEMs

Both companies report that once employed, MSEs (operators) undergo literacy and numeracy test as part of assessing their reading and writing abilities. For Company 2, MSE skills programmes that result in qualifications are valuable for the company. These programmes which lead to formal qualifications which are industry recognized, albeit not against national qualifications are auto manufacturing training, and electrical panel beating technical skills training. These two companies also offer various formal dual-type training such learnership programmes for MSEs, which is seen as critical in addressing skills needs.

Company 1 provides learnership programmes in production technology, operations, and production NQF Level 5 programmes which lead to formal qualifications. These two companies also provide various non-formal company-based training linked to the robotic equipment to enhance

efficiency in the production line, in addition to mandatory induction training for all new employees at all levels. This type of company-based training is seen by both companies as crucial in terms of multi-skilling and reskilling the operators in the context of technological changes. As part of enhancing skills capacity through these training programmes, these two companies also send people around the world, to countries like Germany and Spain to learn skills around the product itself. However, the union representative from Company 2 differed with the senior management, indicating that the training that Company 2 provides to employees is not relevant to current technology advancement.

We are now talking automation, but we still have people with skills that don't enhance the presence of new technology. In the paint shop, for example, we have few people that can operate the machines.
(Interviewed on the 7th October 2019)

At HSE level, the companies prefer formal-based education engineering qualifications from institutions such as Nelson Mandela University for Company 1 and Tshwane University of Technology for Company 2. Both companies also reported to be offering formal dual training programmes in-house (apprenticeship programmes) specializing in auto mechanics, mechatronics, millwright, autotronics, mechanical, and electrical technical skills training. In addition, for Company 1, HSEs also undergo non-formal company-based training which is critical to improving skills sets such as project management, excel for engineers, learning how to programme robots, and specific PLC programming courses.

When new technology gets introduced at Company 1 employees get sent to the headquarters in Germany for reskilling and retraining. This type of training is crucial and ongoing, including induction training which is mandatory for all levels of employees. Company 1 further runs several work-experience

programmes and graduate development training. The company has a training framework that helps them to determine the level of competencies for every employee, and also shares trainees with the component suppliers in the region. Some of the component suppliers, in particular Company 11, have trained their HSEs through Company 1's apprenticeship training programme.

HSEs at Company 2 don't necessarily get trained in-house because they are perceived to possess the necessary qualification from the Tshwane University of Technology, which seems to be a preferred institution. The company does offer upskilling training programmes on robotics and Kuka training programmes at this level and refresher courses to ensure that employees are up-to date with regards to company unique machine settings and operations procedure.

6.5 FEATURES OF GROWING COMPONENT SUPPLIERS

Company 3: Growing component supplier (SA1E57C)

Company Description

Company 3 is a foreign-owned, component supplier of chemical products and materials, and the largest producer in the world and has head offices based in Germany. It has not bought new machines rather its technicians have manufactured the new machines from scratch using their skills. The company is situated next to a TVET College and boasts to have good relations with the College, and some of its employees get trained by the College and it recruits from the college too. It exports most of its products, with very few supplied locally.

Company dynamics and characteristics:

Age: 1996

Size: 225 employees

Sales and Exports: Grown

New tech, products, work organization: Yes, there have been changes in this regard

Structure of workforce

The production line in this company is divided into two chemical and mechanical units, which are the slurry preparation unit, which has operators classified as material handlers; and the coating unit which is more chemical, with chemical mixers as operators. Material handlers are responsible for moving raw material, finished products, and semi-finished products by various means i.e., mobile equipment around the factor to the next processing station.

At the level up, there are coat drivers responsible for setting up the machines through the computers, and slurry preparation. The level after this is the supervisors, responsible for supervising operators (material handlers and chemical mixers) at the coating and slurry preparation department. They run and oversee between 15 and 20 people per team in the production line. This level is followed by the superintendent responsible for supervisors in the coating and slurry departments. There are also managers for both units who then directly report to the production manager.

Technicians in both areas also report to the production manager and engineers tasked with the technical faults in the production. In the maintenance department, the company has fitters and technicians, process specialist engineers who also have their superintendent and senior project engineers. Mechanical fitters and electronic technicians repair and deal with breakdowns and conduct periodic preventative maintenance.

Company 4: Growing component supplier (SA4776B)

Company description:

Component 4 is another component supplier, foreign-owned, located in Ethekewini region of Kwa Zulu Natal Province and has other plant offices in Gqeberha. Its head offices are based in Germany. Company 4 manufactures air-conditioning, management and cooling systems, valve train, cylinder components, and fuel and oil management devices amongst other products. It mainly manufactures to export and has introduced new technology.

Company dynamics and characteristics:

Age: 1921

Size: 739

Sales and Exports: Grown

New tech, products, work organization: Yes, there have been changes in this regard

Structure of workforce

In production, there are operators, staffers, supervisors, and production managers, and the company uses Paxon grading system to group employees from what it refers to as A Band to D Band grading levels. Operators run and operate the machines working through different stages which include furnaces. Staffers in production are responsible to make tubes (aluminium tubes) that go into radiators. The company also has technical positions such as tooling technicians and artisans in the maintenance department.

Tooling technicians are specialized in terms of knowing the tools used to operate the machines, responsible for servicing the machines, and doing repairs if there is a reported breakdown. Besides the technical abilities, technicians generally have to have some leadership and people-management skills. The technicians are also supervised by a foreman who is a

level higher because they oversee and are responsible for the tooling technicians.

Company 5: Growing component supplier (SA286E)

Company Description

Company 5 is a foreign-owned component supplier with parent offices located in Japan. Company 5 has introduced new technology, and exports 95% of its product to Europe. It manufactures catalytic converters.

Company dynamics and characteristics:

Age: 1997

Size: 270

Sales and Exports: Grown

New tech, products, and work organization: Yes, there had been new changes in technology, products, and work organization

Structure of workforce

The company has MSEs (operators) classified as team leaders. A team leader is the first level supervisor; then a group leader, who is more like a senior supervisor; this is followed by the assistant manager. All of them report to the production managers. Operators work according to a specific procedure, and there is a sequence of events in the production, guided by work instructions. They mix different powders with water and other chemicals, following a sequence of work instructions.

Team leaders record the performance per hour or for the whole shift, and ensure that operators are following the standard procedure to ensure the quality of the product they are creating, and ensure that all the specifications are met including productivity. They also check if operators are wearing all the

uniforms and protective clothing. The team leader will be responsible for a line of about four to five people.

A group leader will be responsible for about four sections (more than one line). They need to ensure the safety of employees in every shift, the standard operations being followed or whether the company is achieving targets, and ensuring quality and productivity. They are also responsible for ensuring that operators have been trained; they identify operator's training needs and locate them accordingly if there is absenteeism in a shift.

In the maintenance, there are millwrights or electricians. In the engineering section, there is a production engineering section that assists with new products or trials or new engineering trial parts. The main purpose of the artisans is to oversee the equipment to minimize faults or breakdowns, to ensure machines are maintained when they are not working, and to oversee planned or scheduled maintenance procedure.

Company 6: Growing component supplier (SA707CB)

Company Description

Company 6 is another foreign-owned, component supplier, located in Qqeberha, with its head offices situated in Germany. It specializes in alloy/aluminium rim/wheel production and has also introduced technology in line with OEM product specifications. It exports and also supplies locally.

Company dynamics and characteristics:

Age: 2005

Size: 392

Sales: Grown

New tech, products, work organization: Yes, there have been changes in this regard

Structure of workforce

The task of MSEs (operators) is to operate the costing metal machines where they cost a number of parts per hour at the machines. The second level is setters, whose job is to set up the machines for operations. They are semi-skilled technicians, if you like, responsible for setting up the machines and doing a little bit of programming. The third level is team leaders, who beyond operating and setting the machines also have shown the ability to teach others, and coordinate a small team of six employees in a section. Just above this level, you have a supervisor in charge of the whole team in the production, in terms of punctuality, absenteeism, discipline, and the performance of employees. They also write the report, and report to the plant production manager. Artisans and technicians are located in the maintenance department, responsible for breakdowns and repairing and maintaining of the machines in line with their trades.

Company 7: Growing component supplier (SA354EB)

Company Description

Company 7 is another locally owned, medium-size component supplier. It has head offices in Kwa Zulu Natal and other branches in the Eastern Cape. It has

also introduced technology. The company manufacturers moulded floor carpets, boot packages, sound insulation, parcel shelves, and exterior wheel arch liners.

Company dynamics and characteristics:

Age: 1956

Size: 205

Sales and Exports: Grown

New tech, products, work organization: There have been changes in this regard?

Structure of workforce

The MSEs (operators) are the first workers in the production responsible for machine operation, tool-fitters, etc. When MSEs (operators) arrive in the morning, they need to make sure that there is enough material available to start the job; the working environment is clean and neat; they check machine settings in terms of temperature and parameters; they check the process. Once all those boxes have been ticked, they can start working. If there is something wrong, they need to highlight it in terms of safety because the company is not only using expensive machines but also very dangerous ones: It uses heavy tools.

The next level is team leaders who are responsible for a team of operators. Following this level are supervisors who are in charge of two team leaders in the production.

They rotate per shift; each supervisor rotates with two team leaders in terms of running different shifts. Above supervisors, there is a plant manager. In the maintenance department, there are artisans and technicians supporting

production. Company 7 has mechanical and electrical artisans. They split because they need to support both shifts. Above them, there are foremen, who act as a supervisor for artisans, and above them, there is a maintenance manager.

Company 8: Growing component supplier (SA82E6)

Company Description

Company 8 is a foreign-owned component supplier, located in Gqeberha. It has not bought new technology, rather re-modelling the existing machine, and inserting new features in line with clients' demands. Company 8 manufactures air-conditioning and climate control systems, air cleaners, wiper and washer systems, radiators, reserve tanks, charge air coolers, compressors, and engine control units. It mainly manufactures to export about 95% of its product, with the rest supplied locally.

Company dynamics and characteristics:

Age: 1997

Size: 304

Sales and Exports: Grown

New tech, products, work organization: The Company has not bought new technology. It rather remodelled the existing machine, inserting new and modern features, and has also changed work organization, although the product has not changed.

Structure of workforce

Company 8 has five levels of MSEs (operators). Company 8 has a skill-based grading system instead of a job-based grading system to categorize employees. In another word, the skill that an employee has determines what level of an operator he/she will be, not what job an employee will be

performing. It conducts theoretical tests and practical examinations in addition to their matric qualification, to determine whether a person can be a setter operator or a general operator.

A setter operator sets the machines, which are a bit complicated and need a bit of technical know-how, and falls under level 4. The next level from this is a team leader, who looks after these different operators and reports to the group leader who has various team leaders reporting to him, and he reports to the production manager. In the logistic & distribution section, the structure is very similar: The Company has pickers and packers who are at an operator level, team leaders, supervisors, or group leaders who also report to the plant manager.

There is also a maintenance and process engineering department. The process side looks after processes, and industrial engineering looks after the speed of the lines and does efficiency improvements in these departments. On the maintenance side, the company has apprentices, fitters, and toolmakers who are artisans that report to the supervisor, then report to the plant manager. Overall, on the production side, the company has four levels of operators, setters, team leaders, and group leaders, normally referred to as supervisors; whilst at the engineering side, there are technicians and engineers, artisans, and apprentices who fall under maintenance.

6.6 DOMINANT FORMS OF TRAINING REQUIRED FOR MSEs AND HSEs FOR PRE-EMPLOYED IN THE COMPONENT SUPPLIERS (GROWING)

Mid-Skilled Employees: Operators

All the growing component companies (Company 3, 4, 5, 6, 7, and 8) reported that they recruited their MSEs with matric certificate with maths and science as a preference. Company 5, 6, 7, and 8 further reported that their MSEs further undergo company assessment to test their cognitive ability for company 5,

and 6; in addition, Company 7 and 8 also test literacy and numeracy, writing and reading ability, and also confidence levels.

Company 4 also runs a programme called the Hambanathi (move with us) Laboratory programme in the Kwa Zulu Natal townships schools as part of igniting the importance of maths and science amongst township learners. This type of laboratory training programme is continuous, and has led to some school learners after matric graduation being taken to Germany for engineering-related streams, fully funded by the company.

Company 3, 6, and 7 all reported that TVET-based training is also important for consideration at the point of recruitment and hiring, and Company 3 has a policy that encourages MSEs (operators) to enrol with the TVET College next to the company which specializes in engineering training.

Company 4, 5, and 8 reported that TVET qualification is not a consideration for employment, although Company 4 indicated that some MSEs have TVET qualifications, and this was discovered when they were already employed, as they used matric certificate to apply, since that was the requirement.

High Skilled Employees: Artisans and Technicians

Company 3 reported that at HSE level, it requires a formal engineering qualification either mechanical, electrical, fitter and turner training; or millwright, process and chemical engineering, with trade test. The company further reported that most of these HSEs have been recruited from Nelson Mandela University and Rhodes University, although some came through the PE TVET College, which the HR director of Company 3 reported, "I find TVET candidates' skills and ability to learn inspiring, and they also have a potential".

Company 4 requires formal millwright engineering, fitter and turner's qualification, and tool and boiler making, and has recruited HSEs mostly from the Universities of Technology, such as Durban University of Technology, Tshwane University of Technology, and former Wits Technikon. As mentioned earlier, Company 4 does not consider TVET based qualification.

Company 5 reported that for HSEs it requires a national diploma or degree in chemical and analytical chemistry or any other engineering qualification, as well as five years of experience in a similar position. It reported that people who have millwright qualification and experience can work with machines on their own, as they have programmable logic controller (PLC) experience. However, it also indicated that the PLC experience and the technical understanding that people get from universities is minimal, so they look for people who have on-the-job type of PLC knowledge, and that it has been hard to find these artisans with PLC training or experience. As explained above, Company 5 doesn't consider TVET-based training and has had its HSEs coming from institutions such as the University of Natal, Durban University of Technology, Wits Tech, Tshwane University of Technology, and not from TVETs.

Company 6 and 7 reported to consider TVET for HSE level, especially for artisans, although they did not indicate whether they have recruited people with TVET qualifications in the last five years. Company 6 also suggested that the component industry requires its dedicated training centre because MerSETA facilitated training programmes are weak and lack a practical component.

Company 7 mentioned in general terms that universities of technologies and TVETs were important for recruitment for HSEs although the HR director was not specific on TVETs, and whether or not, the company had recruited at an HSE level in the previous five years. On the importance of TVETs, she indicated that

they “desperately need manual skills”. She went on that the “company desperately needs ... manual skills as there are shortages in terms of process technicians, so TVET seems relevant”. Company 8 indicated that TVET qualification is not preferred by the company at all levels. Only university-based qualifications such as the national diplomas in process engineering, industrial engineering, electrical and mechanical engineering in institutions such as Nelson Mandela University, Rhodes University, and Wits University are seen as important at this level.

6.7 DOMINANT FORMS OF TRAINING REQUIRED FOR MSEs and HSEs FOR EXISTING EMPLOYEES IN THE GROWING COMPONENT SUPPLIERS

Mid-Skilled Employees:

Company 3 indicated that it runs formal dual training for MSEs, to address the skills drought. Informal on-the-job training and ongoing informal training play an important role given the technological need for quality and efficiency in its products. Company 4 also reported that non-formal company-based training was crucial and that the company had a training centre on-site and a training matrix.

Informal on-the-job training is important and there is continuous training to upskill and reskill employees when there is a new technology or product, and this was confirmed by all participants. Ongoing informal training is crucial, and as indicated above, there is a training matrix, in addition to induction training which is important for all employees. The company seems to have no work experience programmes available at this level. Company 5 runs work-integrated learning for students to gain exposure before they get their qualifications. Informal company-based training and other non-formal training (including informal on-the-job training) play an important role in the company. At the MSE level, the company provides mandatory training in terms of legislation (health and safety), and firm-specific training because the

machines that the company uses are unique and no other company has them. The company has a self-development training programme, which MSEs can study at the Project Management Institute (PMI) or the Durban University of Technology, as long as these are related to the company, financed by the company.

The company headquarters in Japan determines operator training programmes, and it trains according to the skills needs of the company, not because there is an outcry of skills shortage in South Africa. It has since licensed one OEM to design training programmes for Company 5's MSEs. Company 6 reported that it collaborates with Eastern Cape Training College (private college) and Nelson Mandela University as training providers for the already hired mid-skilled employees. As indicated earlier, Company 6 also encourages employees to study both at TVET College and Nelson Mandela University as long as they enrol in company-related programmes, and the company finances them. It aims to provide an automotive manufacturing training programme, which will be a national credited qualification, and discussions within the industry are underway.

In addition, it also provides a learnership training programme. Ongoing on-the-job training in terms of how to operate machines for efficiency in product and other job-related training for product quality is seen as crucial and improves productivity. Although Company 6 acknowledges that it doesn't have training facilities/academies accredited, it does nonetheless provide in-house company-based training, which it perceives as important to enhance productivity. Informal on-the-job training is crucial to reskill and upskill employees because the introduction of new technology is not easy and simple for employees even at a higher level. The production manager reported that artisans and technicians were sent to Germany for reskilling in line with new machines. This was in addition to having sister companies in Europe helping to share and transfer skills to the local subsidiary.

Ongoing informal training is part of the company strategy to compete globally, and “as I am talking to you now, we have machine experts here from Germany, helping us transferring skills, and they have been here since last year, [and will be] leaving the end of the year,” explained the HR director. Induction is important to all employees regardless of level. The interview took place at the time the company head offices was on-site to visit for skills transfer for the new machine it had introduced.

Company 7 reported that it provided learnership programmes at MSE level, although not being specific on what kind of skills/training. Non-formal company-based training and other non-formal training are crucial for quality and efficiency purposes. Informal on-the-job training and ongoing informal training are essential for machine handling and operation. Work experience programmes play an important role as some graduates get absorbed after finishing their training programme.

The company offers learning training programmes; it is also planning to provide apprenticeships as well. Furthermore, non-formal company-based training and other non-formal training seems important for the company and the Toyota Motor Company SA, which is close by and helping the company in terms of technical training for HSEs.

Informal on-the-job training is important and there seems to be an agreement among all three participants, including the union, that when machines get introduced workers get trained. There is continuous training happening informally on the job for technical employees as well. Induction training is crucial and plays an important role. Work experience programmes are also available, and when there is a vacancy the trainees get absorbed. The mentioning of manual skills instead of academic skills was rather intriguing and how the TVET College is relevant for these skills.

Company 8 also runs learnership programmes in production technology and other short training programmes in the plant, which are quite helpful for MSEs. Non-formal company-based training helps MSEs on how to handle and operate machines and to be more versatile. MSEs also gets trained on how to problem-solve through a 5S technique; hydraulic training; and other critical on-the-job training such as first aid training, basic computer training, and forklift training. Informal on-the-job training in the context of new products and technology, the production manager reported,

We also have all sort of training such as hydraulic, pneumatic and fault-finding finding. We spend over R4 million per year on training. The world is continuously changing, so the product that we manufacture, we are the product leaders, so continuously training of our employees helps us to stay competitive and efficient and produce quality. (Interviewed on the 15th October 2019)

Higher Skilled Employees:

Company 3 offers formal dual training, which plays an important role in helping the company to address skills problems. Both the non-formal company-based training and other non-formal training are seen as crucial by the company to meet the technological skills demands. On-the-job informal training and ongoing informal training to up-skills and reskill employees are crucial. Whilst induction is crucial across levels, the company reported no internships programmes for work exposure at this level. Company 3 also reported that it did not buy new machines or technology, rather building its own machine from scratch through technicians. The machine was sold to sister companies in Europe, and company technicians who built the machine are training HSEs of these countries on how to handle and operate the machine.

Company 4 also runs apprenticeship training in tool-setting, and making and fitting and some technicians get converted through this programme from

being toolmakers to being millwrights, and that happens in-house. It offers non-formal company-based training on-site through refresher courses. No other non-formal training seems available except those provided in-house. Informal on-the-job training for new technology/product is important to reskill/upskills high-level employees. Ongoing informal company-based training is continuous, in addition to induction training.

At HSE level, non-formal company-based training and other non-formal training are important for Company 5. This is in addition to informal on-the-job training, where people from Japan come down for training and transfer of skills. The company further sends its employees to Toyota South Africa for other specific training. Work exposure programmes are important and the company also trains graduates, as the production manager puts it, "fresh from the university through its graduate development programmes".

Company 8 trains' artisans and technicians in-house through apprenticeship programmes in tool-making; fitter and turner and boiler-making; and boiler-making and welding programmes. Company-based training is crucial especially hydraulic, pneumatic, and fault-finding training. There is continuously informal training of employees to stay competitive, efficient, and to produce quality. The company offers work experience programmes. It offers P1&P2 training, which is an experiential training that engineering students undergo for practical's before they get their qualifications. The HR director reported, "Expected out of this P1-2 training is the portfolio evidence to be submitted to the institution (university), so this training serves as enough experience for us, thus we have some candidates who undergo this type of experiential learning on-site". This company did not buy new equipment, rather remodelling the old equipment through skill utilization of HSEs to insert new and modern features. Further, the MSE is allowed to be innovative and normally advise the management on the best possible solutions to improve products and sales.

6.8 FEATURES OF THREE NOT-GROWING COMPONENT SUPPLIERS

Company 9: Component supplier not growing (SA286EE)

Company Description

Company 9 is a foreign-owned component supplier, located in Gqeberha with its head office situated in Germany. It supplies catalytic converters or exhaust systems to the OEM. It exports about 98% of the products, with the rest being supplied locally. It is also located in the industrial site, with other component suppliers around it. The company has automated everything in the plant for the purpose of efficiency.

Company dynamics and characteristics:

Age: 1995

Size: 536

Sales and Exports: Not Grown

New tech, products, work organization: Yes, there have been changes in this regard

Structure of workforce

The company belongs to Motor Industry Body Council (MIBCO) which grades employees for the company. Thus, the company refers to its employees according to grades, not levels. In the production, it has operators at Grade 3, and in the logistic department, it has operators but referred to as material controllers or handlers which are at Grade 4 as they differ in terms of scope of work.

The operator's job is determined by the standard working procedure that determines activities for that particular workstation; each station has tasks to be completed. The next level is team leaders who are responsible for operators. The third level is supervisors which are referred to as superintendents also categorized according to Hay grading system. They mainly oversee, monitor, evaluate, and report the process in the production line.

At the maintenance level, there are different technical employees, such as artisans and technicians, boilermakers, and robot setters who also have their supervisors known as foremen, and report to the production manager. Artisans work in the maintenance service and repair any broken machine. Other artisans are responsible for designing project phases and toolmaking. Technicians are seen as multi-skilled as normal artisans because they are process-oriented, and they also fulfil a supervisory role.

Company 10: Not growing component supplier (SA69ABA)

Company Description

Company 10 is another foreign-owned component supplier, located in Ethekwini with a second plant in East London. It manufactures high-quality ceramic injection moulded parts and is experienced with interior, exterior, and under-hood components, such as engine cooling, wiper systems, air cleaners. It mainly exports to the USA and Japan. In line with client's specific products, the company has introduced new machines.

Company dynamics and characteristics:

Age: 1965

Size: 500

Sales and Export: Not Grown

New tech, products, and work organization: Yes, there have been changes in regard to technology only, work organization and product changes have remained the same.

Structure of workforce

The company has different levels of operators responsible for griller, fender, emblem, and door-handler stages. It also has quality viewers although these are still operators, responsible for the quality check of the parts before and after they have been painted. It has also operators referred to as line-feeders, and material handlers all of which have no decision-making powers, recruited with matric certificates. They are also responsible for loading, cleaning, and wiping the parts before they are painted. The company has administrators and clerks who form part of the semi-skilled level.

The second level is supervisors, classified as section leaders responsible for the smooth running of the plant. There are also employees referred to as mixers, technicians of sort responsible for mixing the paint, and for ensuring that all necessary chemicals are included. At the maintenance level, the company has artisans responsible for maintenance and for attending to any machine breakdowns in the production. The engineering section is seen as a core focus and function by the company. Thus, it has different engineers, from plating engineers, to chemical and mechanical engineers. Within the engineering stream, the company has quality viewers and quality inspectors.

Company 11: Component supplier not growing (SA16FC4)

Company Description

Company 11 is a locally owned component supplier founded 41 years ago, and has head offices located in Gqeberha, with branches in Gauteng. It specializes in the manufacturing of hot forged-based precision components for the automotive and non-automotive sectors. The non-auto sectors that it

supplies are the mining, aerospace, and power generation sectors. It exports 50% of its products, mainly to Europe and North America and the rest is supplied locally. It has introduced new technology.

Company dynamics and characteristics:

Age: 1980

Size: 200 employees

Sales and Exports: Not Grown

New tech, products, work organization: Yes, there have been changes in this regard

Structure of workforce

MSEs (operators) are responsible for transforming the raw material (metals) into a component and ensuring that quality standards are adhered to, especially at the forge area. They are also responsible to use a Computer Numerical Control (CNC) machine to load and unload metal onto it. In the forge area, there are also forge press operators with a less decision-making role followed by forge team leaders, who fall under skilled and middle management from the production aspect. Company 11 has another occupation, called setter team leader, who is at the same level as CNC machine operators responsible for machine settings. It further has control inspectors, who are almost at the same level as the setter, responsible for the quality of products in the production line and assisting the quality inspectors. Bowers are responsible for inspection and crack detection in the wheel hubs. There are also team leaders responsible for a team of five operators, who oversee the operations. A senior team leader looks at a team of approximately 20 or so, and reports to the production manager whose overall responsibility is planning and giving

strategic direction, not only in the production line but also in the overall company. At the artisan level, the company grows its artisans because there is a shortage, especially of artisans trained with forge background. It trains artisans in-house through toolmaking apprenticeship programmes.

6.9 DOMINANT FORMS OF TRAINING REQUIRED FOR MSEs AND HSEs FOR PRE-EMPLOYED IN THE NOT GROWING COMPONENT SUPPLIERS

Mid-Skilled Employees

Company 9, 10 and 11 which reported to have not grown recruited from high school with math and science (companies regardless of growth or lack thereof, still prefer matric certificate with maths and science). The union from Company 9 indicated that people with matric are recruited for MSE; however, this is done through a labour broker.

They all reported to conduct company assessment tests for MSEs, to test the ability to read and write. There seems to be consistency in all components suppliers and OEMs that regardless of growth trajectory matric certificate is a requirement for MSEs and the companies conduct assessment tests to determine writing and reading skills of MSEs. Company 10 reported that TVET-based training is not considered for recruitment because they are perceived as not providing plastic injection moulding training/qualification, which the company needs and Company 11 also reported that some MSEs have College qualification in engineering.

High Skilled Employees

For Company 9, regarding HSE, the TVET-based training is seen as relevant and the company indicated that it has recruited from the TVET College, although the name of the institution is not mentioned. In addition, the company has recruited from Nelson Mandela University (NMU). The NMU further offers supervisory courses for the company. The union also confirmed that there are

HSE who have TVET programmes and that there is a company policy that encourages employees at all levels to study further through TVET colleges.

Company 10 seems to prefer the Durban University of Technology when recruiting HSE. When it comes to TVET training, there appears to be a contradiction between the HR director and production manager, with the latter supported by the trade union. For instance, the production manager reported that TVET is a criterion and an easy one because the TVET people bring along practical knowledge, and it is not difficult to train them. She goes further to say “universities are good but the attitude by students has got to change because they think they know it all, and we train them whilst we have no university degree”.

The Union also supports the TVET-based qualification as a criterion. On the other hand, the HR director said, “TVET does not form part of our hiring decisions. We look for [something] more industry-specific when it comes [to] plastic injection moulding and these are hard to find in the labour market, and TVETs do not offer these qualifications, instead [offering] more general qualifications”. Company 11 requires HSEs to have formal millwright engineering, fitter, and turner engineering qualifications and the Nelson Mandela University seems to be a preferred recruitment destination, although the company has relations with the College and the OEMs, all of which are next to the company.

6.10 DOMINANT FORMS OF TRAINING REQUIRED FOR MSEs AND HSEs FOR EXSITING EMPLOYEES IN THE NOT-GROWING COMPONENT SUPPLIERS

Mid-Skilled Employees

Company 9 offers formal dual programmes for MSE such as learnership programmes, which are seen as crucial, although they were not specific in which area or field. The company further provides non-formal training on

quality basics, welding, self-inspection, and robot handling training, which are seen as important for the company.

This form of training is ongoing in the company and there are quarterly visits to the headquarters in Germany to acquire and upgrade skills sets, especially on technological changes which are manufactured from the headquarters. This is in addition to the induction training which is ongoing.

For Company 10, as indicated, TVET is not a consideration because it does not offer moulding injecting plastic programmes, the company offers plastic moulding learnership programmes. This is in addition to non-formal company-based training, which is important as it provides a basic industry understanding of the MSE. Continuous training is important for the company to improve quality and efficiency. Informal on-the-job training for new technology/product is important for employees to operate the company equipment. "They get trained loading process training and even if they have their own experience in similar jobs but we do train them to ensure that everyone understands our operations by training them," explained the production manager. Employees are continuously trained on quality and process, and loading process to ensure that everyone understands company operations.

Company 11 which has no problem with TVET training reported that some TVET graduates undergo work-based training to complete their qualifications. Furthermore, the company offers formal dual training specializing in the forge at the MSE level, which is critical as no institution seems to offer forge specialized training in the Eastern Cape.

Non-formal company-based training is crucial and the company has a training plan to run technical training in terms of quality and lean manufacturing. It further collaborates with Volkswagen Group South Africa on other training, especially for unemployed youth where they share learners on various training programmes. Informal on-the-job training and ongoing informal company-

based training are important in the context of technological changes. Induction plays an important role in this company. Work experience programmes, especially for potential workers, are crucial for pre-employed potential workers such as internships.

High Skilled Employees:

Company 9 provides formal dual programmes, such as apprenticeship training which is useful for the company. Non-formal company-based training is seen as crucial for artisans/technicians as part of upskilling/retraining them. Informal on-the-job training and ongoing informal company-based training are important given the changes in technology. Induction is crucial across the board.

Company 10 offers formal dual training programmes in fitting and turner, tool-making, and also offers a trade test qualification—be it millwright or any other engineering stream—to address skills needs. It provides refresher courses. Continuous training is important for the company, especially in the context of new technologies, and plays an important role in addition to in-house training/induction.

Company 11 indicated that some artisans and technicians specializing in forge have graduated and been recruited from the apprenticeship programmes in fitter and turner and tool-making training. Non-formal company-based training is crucial and the VW plant also plays an important role in other non-formal training to the company. Informal on-the-job training and ongoing informal-based training are important in terms of new technologies/product change. The HR director reported that the company competes with Asian countries, so new training albeit informal on new changes is crucial. Induction is standard across occupational levels. Work experience programmes such as internships are also crucial in the company.

Skills programmes that enhance soft skills are seen as important and a requirement in both OEMs and component suppliers. Companies report candidates to be lacking soft skills such as time management; discipline; work ethic; punctuality; teamwork, and interpersonal skills are important for companies. As a result, they report to be struggling with these skills even for candidates who have formal education.

The component suppliers acknowledge the Youth Employment Service programme launched in 2018 for filling the gap on soft skills, and is seen as crucial in training candidates. This was confirmed by the production manager from company 10 who reported:

While qualification plays a role and is important, at the same time, Youth Employment Service programme is helping in terms of soft skills like of good attitude, have the right mind-set, discipline, and also [producing] results. (Interviewed on the 28 October 2019).

6.11 VARIATIONS IN HOW COMPANIES PERCEIVE TVET QUALIFICATIONS

There is variation in how the companies perceive TVET qualifications. Five companies, four component suppliers (Company 4, 5, 8, and 10) and one car manufacturer (Company 1) perceive formal TVET programmes to be weak and of poor quality. For these companies, they rather prefer a candidate who has gone to technical high school than a TVET candidate. The HR director, who is also the plant manager from Company 8 reported that:

The TVET College in terms of quality is not good. For me, TVET products are not quality, because they have 80% theory without practical. I would ordinarily consider someone who has gone through technical schooling, who has practically done layers, worked with bolts and nuts,

screws using hands, than someone who just went to TVET College.

(Interviewed on the 15th of October 2019)

The component suppliers attribute these weaknesses to the absence of the industry partnership with colleges, general lack of TVET trainers with industry experience and background, as well as a general lack of coordinated linkages between colleges and companies beyond the MerSETA.

Furthermore, the manner in which TVETs are structured is perceived to be a problem, which is to absorb those who are not academically inclined, thus unable to make it to universities. This was confirmed by the HR director from Company 5 based in Kwa Zulu Natal:

The cohort of learners that cannot make it to universities is being pushed to TVET, as a last option. This makes it impossible to get value out of it, moreover that they are also not linked to the growth trajectory of industries. The South African TVET system is used [as] a by-the-way, whereas other countries use TVET as part of their mainstream education system linked to industrial strategies for companies. (Interviewed on the 25th November 2019)

The remaining six companies (five components and one OEM) seem to have no problem with TVET programmes, although there are variations within them too. For instance, Company 3 would consider formal TVET programmes at all levels at the point of hiring, and the other two only consider TVET programmes at an operator level. This was confirmed by that the HR director at Company 6 who revealed:

We have operators with various TVET diploma qualifications. As [a] result, [the] TVET programme is also a consideration for operator selection; that's why we also conduct assessments for candidates with matric to determine their level of skills, and quality is everything to us. (Interviewed

on the 17 October 2019)

These six companies, especially the component suppliers, perceive TVET programmes to be relevant for the manual or practical skills that these companies need. They all perceive candidates with TVET College qualifications to adapt quickly and easily grasp technological changes because they have both theoretical and practical backgrounds.

This was confirmed by the production manager from Company 6, who said that “a TVET qualification helps people to grasp technology quickly and work faster as well [as] to complex settings than most employees”. Furthermore, the HR director from Company 3 (interviewed on the 18 October 2019), indicated that “we find their skills and ability, attitude to learning inspiring as they have potential”. As a result, these component companies reported to be working with TVET colleges in terms of training and upskilling or reskilling programmes mainly for MSEs. As the case study findings show collaborations between companies and TVET are perceived to be important to better respond to the emerging technological patterns in the context of skills.

The production manager from Company 3 reported that:

We are now partnering with PE College-Iqhayiya campus to train people on mechanical and electrical fitters to respond to the demand for high-level technical skills, while NMU is our strategic institution for chemical course enrolment. (Interviewed on the 18th October 2019)

Despite the divergence of perceptions on TVET programmes, there is a convergence of views by senior management and production managers in nine component suppliers that strong and coordinated linkages between colleges and all manufacturing industries, not just the automotive alone, are crucial for skills training provision. This is because the TVET sector is seen as crucial to respond to skills problems facing the economy as a whole, thus

linkages and partnerships with industries are crucial for the South African economy.

There is a growing trend from component suppliers that their involvement in the TVET colleges beyond available platforms such as MerSETA is important for the TVET sector in South Africa. Companies interacting with colleges directly could help in shaping the TVET curriculum content to better align with what is obtainable in the industry. This could also provide access to facilities not available in the colleges, and also train and retrain TVET teachers. Although there seem to be variations in how companies perceive TVET programmes, five-component suppliers appear not satisfied with TVET programmes and attribute its weakness to lack of company involvement in the TVET space in terms of curriculum design and programme development.

6.12 SHORTAGE OF TECHNICAL SKILLS

Although companies require formal qualification pre-employment and it contributes to skills needs to various degrees, component suppliers report a technical skills shortage in this regard. There is an ongoing debate around the question of skills shortage, with one narrative arguing that employers invoke the skills shortage to accelerate economic restructuring; and that their perception on the skills problem is narrow; and the other view arguing that there economy has a shortage of technical skills. The research findings seems to confirm the frequent narrative of skills shortage, and they case study findings and that of the survey findings in Chapter 5 are consistent which confirms the literature reviewed in Chapter 2 that the sector has serious technical skills problem. For instance, the component suppliers report that the South African labour market has a serious shortage of engineering-related skills, which are critical for economic growth and industrial transformation. Illustrating this finding, the human resource director from Company 11 (interviewed on the 14th of October 2019), which reported to have not grown indicated, "We have a huge artisan shortage, especially in the forge area. As a consequence, we

develop our artisans because they are not available in the market". It seems that the very same component companies that don't consider TVET at a point of hiring and recruitment are the same companies that report technical skills problems.

Instead of working with TVET colleges to address the technical skills deficit, some component suppliers in Kwa Zulu Natal, prefer to work with public high schools to nurture learners, especially from townships, through various engineering programmes. For instance, the production manager from Company 4, based in KZN confirmed that:

We nurture and guide learners doing physical science and mathematics subjects in preparation for engineering streams in universities, and universities of technology. After graduation, some are taken to company headquarters in Germany to be trained in technical skills, which we desperately need. (Interviewed on the 26th November 2019)

There are various reasons that are perceived to have led to this perceived technical skills shortage in the sector. Firstly, five component suppliers perceive the dissolution of the Motor Industrial Training Board (MITB) as having led to this problem of skills shortage, particularly for artisans and setters. The technical skills, particularly those of a setter, are perceived to be dropping because the generation that was trained by the MITB before it was dissolved is retiring, and there is no training specifically designed to maintain and feed the auto industry. In this regard, the human resource director at Company 8, a component supplier in the Eastern Cape confirmed that:

The setter training is not readily available in SA, because post-1994, the Motor Industry Training Board (MITB) was disbanded or dissolved by the

democratic government which used to look at technical training for the auto industry as a whole. (Interviewed on the 15th of October 2019)

This view is also shared by the production manager Company 8 who agreed with the HR director that:

The level of technical skills is dropping particularly for setters because there is no cohort coming out of industry-specific training that the MITB use to run for the auto sector..... it [this level] is dropping because the generation trained by MITB that we have before it was dissolved is retiring and there is no training specifically designed to maintain and feed the auto industry — so the gurus are no longer there anymore. (Interviewed on the 15th of October 2019)

Secondly, the component suppliers perceive the MerSETA facilitated training to be more administrative-related concerned than practical manufacturing training skills. Explaining his frustrations with skills training programmes facilitated by MerSETA, human resource director from Company 8 reported that “candidates signed off by MerSETA as artisans are technically weak and cannot even hold a screw, a spanner, or even a plier which borders on the poor quality of artisans approved by MerSETA, an institution established to take over from MITB”. For this reason, Company 8 runs its formal dual training programmes in production technology, fitting and tuner, and welding as it perceives the MerSETA approved skills programmes for the industry as weak and not addressing the technical needs. Although there are private companies who are purportedly running this kind of technical training, Company 8 reported that “the units of standards of the courses and topics

offered by some of these private institutes, are more softy skills, admin rubbish-related than practical heavy stuff we need”.

Despite five component suppliers seemingly having problems with MerSETA-facilitated skills, four component suppliers and two car manufacturers acknowledge MerSETA for skills programmes. For instance, the human resource director from Company 7, a local owned component supplier based in KZN, reported that “we have a very good relationship with MerSETA”. In addition, all trade union representatives also reported having no problem with MerSETA in regards to skills. The Trade Union Representative from Company 2 reported that:

MerSETA is the institution that we work with to either train our members or being referred to relevant institutions accredited to MerSETA for our employees to get necessary training and certification. (Interviewed on the 7th October 2019)

Thirdly, there is also a shortage of female artisans and engineers within the industry, which is attributed to the lack of females in the Science and Technology Engineering, and Mathematics subjects. As a result, seven component suppliers, mostly those that do not consider TVET an option, provide bursary schemes targeting high school learners who are doing physical science and mathematics across the three provinces (Eastern Cape, Gauteng, and Kwa Zulu Natal), mainly Black and females, to encourage them to enrol for engineering streams. In this regard, the human resource director from Company 4 confirmed that:

One of the biggest challenges we face in our industry, not only in this company, is the lack of female engineers. We are in certain instances funding children's education right up to matric, especially those doing mathematics and science using our Corporate Social Investments programme. (Interviewed on the 27th November 2019)

The skills shortage is not only consistent with the survey phase analysed in Chapter 5 but also confirms the literature reviewed in Chapter 2 that the technical skills deficit is a serious challenge facing the automotive sector in South Africa (Automotive Supply Chain Competitiveness Initiative, 2016; Department of Trade and Industry, 2011; Du Toit & Roodt, 2009; HSRC Automotive Industry, 2008; MerSETA, 2018; MerSETA Sector Skills Plan, 2017). Although the literature acknowledges an increasing number of engineering graduates with either degrees or diploma qualifications from various educational institutions, it argues that these graduates are inadequate as they also have to respond to all sectors of the economy and not only to the automotive sector (Automotive Supply Chain Competitiveness Initiative, 2016).

Beyond attributing these skills problems to the dissolution of the MTIB, the case study findings seem to attribute the skills problem to a poor basic schooling system. The latter is consistent with the MerSETA Sector Skills Plan (2017) report that the poor quality schooling system, low enrolment in maths and physical science, as well as low-quality teaching personnel poses a serious threat to any aspirations of growing a sizeable number of engineers, artisans, and technicians for not only the industry but also the economy, a critical aspect of growth.

6.13 CONCLUSION

The chapter has shown that formal training at all occupational levels is still relevant as a prerequisite for employment in the sector. It has shown that the basic education system, especially with mathematics and science, is seen as important as it gives candidates the ability to read and write, which is important for the various forms of training that companies provide. Formal dual types of training at all levels is seen as essential for companies and play an important role to address skills needs.

Company-based training—non-formal training, induction orientation, and

informal on-the-job training, all of which happen in the workplace—is relevant for companies and plays an important role in the sector. Although companies provide various forms of training in addition to formal qualifications, they report a skills deficit at the HSE level.

The shortage of skills is attributed to the dissolution of the motor industry training board which was responsible amongst others to train the technical employees for the automotive sector. While MerSETA is still acknowledged in terms of skills development programmes, there are growing concerns amongst the component suppliers that MerSETA signed-off artisans are rather weak and need further technical training. The next chapter discusses the relationship between skills and industrial transformation.

CHAPTER SEVEN: INDUSTRIAL TRANSFORMATION DRIVES SKILLS UTILIZATION IN THE AUTOMOTIVE SECTOR

7.1 CHAPTER OVERVIEW

In this chapter, I focus on the relationship between the skills and industrial transformation to determine whether skills training programmes drive industrial transformation or vice-versa. This chapter responds to research question number 4 as explained in Chapter 1: What are the underlying factors that shape or influence skills contribution to company growth and transformation? The case studies show that industrial transformation (measured in terms of technology and work organization and product change) is driven by other contextual factors such as national industrial policy, customer demands in terms of product specifications, competitions (especially within the component suppliers sector), and global market dynamics, and not skills as I had anticipated. The industrial transformation drives skills, to address or meet customer demands in terms of product specification requirements, and this is also consistent with survey results in Chapter 5. It seems, based on the data, that changes in technology provide further impetus for all companies to invest in the provision of training which is critical for company-level changes in terms of technology. Thus, the ability to read and write enables MSEs to be able to learn or develop skills that help them to adapt quickly and faster to workplace changes. Industrial transformation has improved working conditions and the wellness of employees; and it has been inclusive and diverse in terms of gender participation in all the companies. The inclusive nature of company-level transformation has also been acknowledged by trade unions, although there is a strong perception in all companies that women's participation especially at a higher level is still not at a desirable level.

7.2 TECHNOLOGICAL CHANGES IN THE WORKPLACE

As I have indicated, in this section I show that formal skills at all levels are not drivers of workplace changes in technology. I also argue that changes in technology have had a positive impact on employment, and required new skills, which suggests that there is a relationship between transformation and skills.

7.2.1 Drivers of Technological Changes

Drivers of technology are the same across all nine companies whether they have grown or shrunk, except Company 3 which reported to have manufactured their own equipment utilizing HSE skills, and Company 8 that has re-modelled the existing machines inserting new features in line with customer demands and specifications. Explaining how effective use of skills help them to remodel the existing machines instead of buying new ones, the human resource director from Company 8 reported:

We produce shock absorbers through a machine that used to make bullets for the Second World War. Because of the effective redeployment of skills to address new modern features of products, employees through their skills have helped to re-design and re-tooled the machine in terms of layout for modern products. (Interviewed on the 15th October 2019)

Company 3 is reported to have grown and has manufactured its own new machines from scratch through technicians' skills. The HR director in Company 3 reported that "our technicians had built a new machine for us from scratch and they are training our sister companies in Germany on how to use it". All companies including those that have not grown reported to have automated many areas in the production line to speed up the production process, and this is perceived to have improved efficiencies and productivity.

The process of automation seems to have not affected existing employees in terms of skills, because as the human resource manager from Company 9, explained: “We had to upskill them internally in line with new technological changes”.

As explained in Chapter 6, Company 9 has not grown in terms of sales and labour force, and there was no salary increase as well. This seems to be a trend emerging from all companies that new technological changes are critical to improve and augment production capacity and drive efficiency, a view which was also shared by the unions. These changes are essential for the automotive sector because, as the data shows, for every car model produced yearly by car manufacturers, the original equipment manufacturers (OEMs) often require new changes in product design, shape, and size, which essentially requires the latest technology, thus the component suppliers also change in line with their clients. The technological changes, as the findings reveal, are consistent with the literature reviewed in Chapter 2, according to which such technology is crucial to enable the growth of the industry (MerSETA Sector Skills Plan, 2017).

As indicated, skills are not key drivers of company transformation. Case studies show six underlying factors that are critical for industrial transformation and appear to influence skills contribution: Firstly, clients' product demands and specifications are seen by all eleven companies to be central to technological changes. In other words amongst other factors for consideration, product demands and specification are key drivers of technological changes in the automotive sector and this was confirmed by all companies, including those that reported to have shrunk. Illustrating this point, Company 6 human resource director indicated that “the OEMs as our major clients influenced us to introduce technology due to their particular demands in products”.

The production manager in Company 6 also confirmed that “OEMs are an important market for us; when they demanded bigger rims in terms of inch size, fancier wheels, we had to change technology because fancy rims are technology manufactured, so upgrade was necessary for us”. The OEMs are major clients to component suppliers, and playing a major role in influencing component suppliers to effect technological changes to meet their market demand. Secondly, the national industrial policy is another underlying factor important for industrial transformation and influencing skills contribution perceived by all companies to have played an important role for companies to make changes in technology.

Company 9 which was not growing also reported that the government incentives and Automotive Production Development Programme have helped to win new contracts to be major suppliers of OEMs in the last two or three years. The role of industrial policy for company growth is consistent with the literature reviewed in Chapter 2 that it contributed not only to the stabilization but also to the growth and expansion of the automotive industry in terms of employment, sales, and exports (Barnes & Black, 2013; Barnes & Kaplinsky, 2000; Black, 2001; Black & Mitchell, 2002). The automotive industry in South Africa is widely seen as successful because of the industrial policy introduced post-1994. As per the literature reviewed in Chapter 2, the industrial policy is seen to have allowed the OEMs to put pressure on supplier-upgrading as a pre-condition in awarding components contracts (Masondo, 2018). It is Important to note that the OEMs design technology and parts required for the car model. In this regard, Company 8 production manager said:

We have a contract with Mercedes-Benz to manufacture and supply the shock absorbers for the new C class that is coming out next year. We had to come up with the designs that meet their performance specifications, we have taken their performance specifications,

developed the products and tested them, sent them off to them, and they approved it because it met their performance specifications. (Interviewed on the 15th October 2019)

Thirdly, seven component suppliers (Company 3, 4, 5, 6, 8, 9, 10) reported that research and innovation development, which they conduct through their head offices outside South Africa, also influences them to change technologies. Research and innovation are perceived as critical in understanding global market trends, which shape or influence technological changes. Company 5 HR director confirmed that:

Research and development which we continuously undertake through our head office in Japan, helps us to forecast future trends, and the electric vehicles which are in the market require companies to be technologically advanced. (Interviewed on the 25th November 2019)

However, the HR director at Company 5 continued,

I cannot divulge what changes we have made and what changes are we going to make in this regard. Safe to say the changes were driven either by-product change of the customer (OEMs) or to improve our capacity. (Interviewed on the 25th November 2019)

There is a growing trend that company head offices located outside South Africa often employ their skills and training expertise, infrastructure investment capacity, and research & development (R&D) to forecast the global market and industry trends. This helps them [the head offices] to plan, design the latest new machines and equipment for deployment in the value chain, and make decisions that bind local subsidiaries [SA-based companies].

This finding is consistent with the literature reviewed in Chapter 2 that the design and decisions on new and latest technology are decided upon outside South Africa by the local subsidiaries' head offices.

The literature attributes this to foreign ownership in the South African automotive industry, with the introduction of the Motor Industry Development Programme seen to have facilitated foreign control (Barnes, 2013; Black, 2011; Masondo, 2018). Essentially, the ANC government post-1994 elections is seen to have dropped the ball in this regard by permitting the control and decision on capital investment to be outside of its scope, without any role or influence, and yet it plays a major role in financing the very industry to compete globally (Masondo, 2018). Although this is true, it seems to be a global phenomenon as there is nowhere in the world where parent companies do not control the decisions on technology and capital investment which the local subsidiaries implement. Besides, South Africa currently doesn't own or control any of the OEMs, let alone major component suppliers, and in this sense controlling decisions on technological investments would be impossible. Thus, I suggest that for South Africa to have the upper hand on technological design and investment decisions on the latest capital investment (machines), it has to explore the possibility of establishing its own car manufacturer, just like South Korea managed to do. Fourthly, external factors such as global market forces and price volatility influence technological changes for companies to keep up with global trends, and this is also confirmed by the senior management and production managers in all companies.

The fifth driver, competition amongst companies that manufacture the same products, is seen as important to keep companies on their toes and follow trends, thus, re-investment in new equipment is essential for both industrial transformation and market growth. For example, all component suppliers regardless of their growth status reported that competition has influenced technological changes. Confirming the competition as an enabler of transformation the production manager from Company 10, which was not growing said:

We bought the machines to upgrade our production efficiency and also to compete with other firms in the value chain and produce goods faster at a reduced time. (Interviewed on the 27th November 2019)

The importance of competition is also consistent with the literature attributed to the MIDP, which gradually phased off tariffs leading to more exports incentives to improve local industry's global standard in terms of competitiveness (Department of Trade and Industry, 2007a, 2007b, 2009, 2009; Lamprecht, 2009; Mashilo, 2010; The Department of Trade and Industry, 2007a, 2007b, 2012)

The sixth driver common to all eleven companies is new regulations on emission(s) demanded by the government through the industry, which are getting stricter especially for the component companies. The production manager from Company 5 explains that "these emissions regulations are getting tighter and they require more expensive rare-earth metals that are difficult to get in some countries". So companies have introduced new machine equipment in line with new regulations demanded by the industry in line with government regulations.

7.2.2 Technology, employment and skills

The section above has shown that company transformation has been driven by six critical factors, not skills, but these factors shape skills contribution to industrial transformation. In this section, I show that changes in technology drive skills. Companies report that as they buy new machines to enhance production and improve efficiency, they also require skills to operate these machines. These changes in technology have led to a surge in employment opportunities, and this was confirmed by two OEMs, (Company 1 and 2), and six component suppliers (Company 3, 4, 5, 6, 7, and 8) that had employed more people and demanded new skills. These are the same companies that reported to have grown. The surge in employment was also confirmed by

union representatives in these companies. Describing the employment expansion attributed to new technology, the trade union representative from Company 5 reported:

The company has the ZECT1 line operated by four members, and the introduction of ZECT line 2 led to robots being introduced, and the manual work used to be done in terms of transferring parts into the machines is being carried out by the robots. Instead of having four members, the company hired two new members for the new line. The hiring of new employees was not that there was a lack of skills internally, but it was more to increase employees instead of reducing them. (Interviewed on the 25th November 2019)

Technological changes appear to have expanded employment in the automotive companies instead of retrenchments, albeit with a re-deployment of workers after reskilling and upskilling. There seems to be a correlation between changes in technology and reskilling/upskilling of employees on the job, which relates to the non-formal and informal training as explained in the conceptual framework.

The trade union representative from Company 1 explained how the new technology led to training as well as the expansion of employment saying that “the robots were introduced massively in the press shop and body shop, and demanded new skills, thus the company through our insistence retrained and upskilled workers, on top of poaching from other companies for skills”.

The production managers in the very same company seemed to agree with the trade unionist that robotic machines have not led to retrenchment, instead having created more jobs, and required new skills. Furthermore, Company 5 production manager also confirmed that:

The introduction of technology did not lead to the retrenchment of employees. Instead, we employed more people with high skills, such as chemical engineering diploma qualification for group leader positions, and for operators the requirement stayed the same. (Interviewed on the 25th November 2019)

It is only in Company 6 where the introduction of machines could be argued to have displaced workers. In this case, the HR director from Company 6 reported that:

They were not dismissed per se or retrenched because of skills redundancy; instead, they took a voluntary retirement package, despite the company offering the opportunity to go and study and other reskilling programmes. (Interviewed on the 16th October 2019)

He continues "Because they were at retirement age and mostly with no matric, they decided to voluntarily leave the organization". He was also supported by the union in this perspective. The union representative from Company 6 said:

This was not the first option, but our members especially those who were without matric and old, voluntarily left with packages, despite the company offering training and for them to study. (Interviewed on the 16th October 2019)

Essentially, the senior management and production managers in all companies, as well as worker representatives in eight companies perceived non-formal company-based training, as elaborated in Chapter 6, to be playing an important role to adapting faster to technological changes.

However, worker representatives in Company 4, 10 and 11 are of the view that adaption to new changes depends on the mind-set and attitude of individuals rather than on qualification. In this regard, the trade union representative from 11 reported that “adapting to technology depends on the individual employee, not a qualification. It is your attitude and mind-set as an individual that makes you cope, not your qualification”.

There is a general trend though across companies that technology has made production processes simpler and this is consistent with the survey findings in Chapter 5. However, the unions acknowledge that

When machines are introduced, there is always fear amongst workers that these machines have the potential of taking away jobs in the long run, although it makes operators' jobs simple and easy. (Interviewed on the 25th November 2019)

This section shows that contrary to the dominant narrative of technology destroying jobs, it has at least in the companies that have been interviewed created employment opportunities requiring new skills in the work-organization process in the production, and employees instead of being dismissed have been working with robots.

7.3 DRIVERS OF PRODUCT CHANGES

In this section, I show that changes in product have been driven by technology mainly to address customer concerns, and non-formal company-based training has played an important role in this regard. The participants at all levels across companies report having fundamentally changed their products as a result of the technological changes to improve the overall customer product concerns. The senior management from two component suppliers, both of which were growing, reported that the changing nature of work and globalization compels companies to keep up with global trends. This was confirmed by the HR director from Company 5 who said:

As global leaders in our unique products, it is important to keep up with international trends moreover that the electric vehicles are also coming to the market especially in Europe where we supply. (Interviewed on the 25th November 2019)

Non-formal company-based training is seen as a necessary ingredient in the context of product change to address and maintain quality products. This was confirmed by the production manager from Company 5 who reported that:

Products that require new modern features have become complex, and require more high skills essential to addressing the quality that customers require, hence training in terms of design and manufacturing tools remains crucial. (Interviewed on the 25th November 2019)

The utilization of skills is perceived to be important for industrial transformation in terms of production change (work organization and technology) to remain competitive and meet global standards. The human resource director from Company 8 reported that:

We produce shock absorbers through a machine that was used to make bullets for the Second World War. Because of the effective redeployment of skills to address new modern features of products, employees have helped to re-design and re-tooled the machine in terms of layout for modern products. (Interviewed on the 15th October 2019)

Even though the technology has not been changed by Company 8, the engineering design has fundamentally altered in line with product specificities by clients. This is why engineering qualifications and the trade test are seen as important in the context of the industrial transformation taking

place in the sector. This is in addition to soft skills that are perceived to be essential to product quality and standards.

7.4 DRIVERS OF WORK ORGANISATION

In this section, I show that companies have re-organized work because of technology and also that skills were critical. Firstly, companies have re-organized work to improve working conditions in terms of ergonomics and performance of employees, and to enhance productivity. Secondly, work organization was a result of customer complaints in terms of product quality. Thirdly, technological changes seem central to the work organization to improve production in terms of the quality of products, but in this context, it is also about improving working conditions and the environment.

The changes in work organization have created employment opportunities instead of retrenching workers, and demanded new skills. Thus the non-formal company-based training, especially for MSE, is seen as helpful to manage time in production, enable efficiency in products, and eliminate waste.

While all companies have restructured work, there are variations between the OEMs and component suppliers, and the following seems to be common drivers of work organization in the component companies. Firstly, work-restructuring has happened because of the merging of two different plants into one, leading to the clustering of two production lines and expansion of working shifts from 12 hr. shifts (day) to 24 hr.(night) shifts.

Secondly, technological changes are central in companies having to re-organize work in the production, mainly to improve production in terms of efficiency and quality. Thirdly, customer complaints from the OEMs about the quality of products in terms of defects are perceived to have influenced work organization. Fourthly, the product change in terms of layout, shape, and size, which demands new skills as a result of new technologies is seen as crucial to

enhance quality, minimize defects and reduce waste. In one company, the human resource director from Company 8, reported that:

We have decentralized the running of the factory in the production from the sectional departmental manager by empowering the workforces to run departments on their own mainly to improve the productive capacity. (Interviewed on the 15th October 2019)

The HR director continued that this resulted in splitting certain functions between robots and workers. Other workers, instead of being retrenched, were re-trained and redeployed to perform other tasks.

The OEMs seem to have restructured work mainly to improve working conditions in terms of ergonomics and performance of employees, and to enhance productivity. While eight companies, both OEMs (Company 1 and 2) and six component suppliers (Company 3, 4, 5, 6, 7, and 8) which have all grown acknowledge that robotic machines reduced the number of people in a particular line, but that these were redeployed after training to perform other tasks in line with the skill set.

In some instances, work-organization is reported to have been accompanied by surveillance which workers didn't approve of as they perceived it to being policed at work. This was confirmed by the trade union representative from Company 4 that "there are cameras in the paint shop because the company struggled with the quality, so these cameras monitor if people are working and workers did not take this kindly, as they felt being policed by the cameras". The unionist went on to clarify that this did not affect skills, and people instead of being retrenched were redeployed to less challenging, repetitive, and routine work.

Despite technology being central to work organization, the Likert scale shows that informal on-the-job training is helpful to manage time in production, enable efficiency in products, and eliminate waste. Thus, all companies

reported that company-based training in addition to formal qualifications, in the context of skills utilization, is crucial to perform different tasks. The task of employees at a higher level is often complex and requires innovative thinking, problem-solving, and attention to detail.

7.5 INCLUSIVE NATURE OF TRANSFORMATION

In this section, I show company transformation has been inclusive and diverse in terms of gender profile in the workplace, although there is acknowledgment across participant categories that women's participation, especially at a higher level, is still not at a desirable level. Explaining the gender profile in various departments in Company 3, the production manager reported that “at our maintenance department, females are not as many as we should have, but we are mindful of that”. There is a noticeable trend in these companies that at the MSE level there is a fair 60:40 ratio of men to women in eight companies, although two companies have reported falling behind at this level. At the higher level, there is unanimity by all companies that a lot still needs to be done to address gender imbalances, particularly when it comes to artisans and technicians.

The majority of component suppliers indicate that the lack of women in technical positions such as artisans and technicians, setters, and engineers is a societal problem rather than an industry-wide issue. Illustrating this, the human resource director from Company 11, which was not growing, said:

There is a serious shortage of women in engineering and science fields which reflects in technical positions, and for me this is a societal problem, then an industry issue that needs all stakeholders i.e., us (industries), government, and civic society to ensure that women are empowered through Science, Technology, Engineering, and Mathematics (STEM) fields. (Interviewed on the 14th October 2019)

Consequently, all companies are undertaking various programmes at various levels specifically targeting African female employees to address the gender profile in terms of employment equity programmes. The perception of companies, especially the component suppliers, is that the industry in South Africa has been male-dominated in the last three decades. To close the gender imbalance in the workplace the human resource director from Company 7 said:

We are recruiting for diversity. Women themselves in the industry have realized that they can do anything in this space. In the engineering space particularly artisans we are trying to find women to diversify that area. (Interviewed on the 29th November 2019)

The OEMs are actively training females at the supervisory and technician level to address gender parity. The human resource manager from Company 2 reported that “the lady (production manager) you interviewed earlier on is a result of the efforts the company is making towards addressing gender imbalances”. The production manager herself agreed and shared that the company is striving to achieve gender balance, mostly at a higher level. She is a product of company efforts to address the injustice of the past and gender equity. However, the trade union representative from Company 2 had a different view on the gender inclusivity issue, and reported that “the female promotions they are doing here are window-dressing exercises, as Africans are hardly promoted despite their experience and expertise”.

He continued and revealed that:

The CEO is British; the technical director is a South African White Afrikaner; the HR is a Coloured lady given the position by the CEO, as she does not have the necessary experience and expertise having previously worked as a director of the legal unit. However, the HR GM is a Black guy who has just been promoted to the position for window-dressing because the HR director is a White lady, so the guy you were

interviewing as our HR GM doesn't call the shots, and the head of HR is a White lady. I am sure they sent him deliberately to meet with you guys. (Interviewed on the 7th October 2019)

The union further reported that in production there is only one Black person and the "other woman, which you guys interviewed [the production manager, I interviewed] they promoted her out of nowhere and called that transformation". He continues:

Black people hardly get an opportunity to go to China or the USA, and Germany for training and exchange transfer programmes. It's always Whites and Indians. I mean even at our level [of operators], we are supervised by Whites. Some of them are little boys who just joined the organization recently, and they handpick other White guys who are operators for any overseas training or reskilling transfers, so to us, that is pure nonsense, as it doesn't fundamentally recognize the working class. (Interviewed on the 7th October 2019)

This breakdown from the union point of view at Company 2 underscores the perceived skewed promotion and somehow lack of inclusiveness taking place in this one company. However, it is worth mentioning that all other companies and union representatives except for this union representative in Company 2, and especially HR directors, perceived it to be their duties and core role to ensure and monitor company compliance with an employment equity plan established to address the imbalances and injustice of the past. Other companies reported to provide training for women workforce in courses such as leadership and management, and quality control training to fill whatever vacancy accordingly.

Eight components suppliers including those that reported to have shrunk revealed that women form part of apprentices who are developed in-house to address technical skills' shortage and gender problems. Five of these companies, which are Company 1, 2, 3, 4, and Company 11 reported to

have promoted females at technical and management positions after they qualified through the apprenticeship programmes. The human resource director from Company 11, which reported to have shrunk, confirmed that:

We do recruit females because of equity and social development. I mean we just hired a female artisan, she just passed her trades test as an electrician in the forge and we are very proud of her. So nothing holds them back except where there is physical demand to lift metals, and we also have in our branch a female millwright artisan. (Interviewed on the 14th October 2019)

Companies seem to have a keen interest in female development and their wellness at work to ensure that they work in a conducive environment suitable for their conditions. They are hardly deployed to areas where there are heavy machines and big nuts to be lifted, which require physical strength. According to the HR director from Company 6: "It's not that we discriminate, but the nature of work in that space doesn't allow, and they are also aware". Furthermore, the production manager from Company 11 also agreed that:

In heavy heat areas because of fire that is used to burn and melt aluminium and other precious metals after mixing with chemicals, females are hardly deployed in those as the environment may have a serious effect especially on pregnant women. (Interviewed on the 14th October 2019)

7.6 UP-SKILLING IN THE CONTEXT OF TECHNOLOGICAL CHANGES

In this section, I discuss the various reskilling training programmes that companies offer when they introduce new technologies. Consistent with dominant forms of training discussed in Chapter 6, informal on-the-job training is seen as important to address the skills gap in the context of the new technology to improve the performance of the workforce and enhance working conditions.

As discussed in Chapter 6, there are various training happening in the workplace which are formally structured and designed but do not necessarily lead to formal and credit-bearing qualifications, although there are some training programmes that lead to an industry-recognized qualification. In some instances, qualifications, especially those that are industry recognized beyond the company level, are also accredited by SAQA and this was confirmed by the acting human resource director from Company 1 that “some of the qualifications are accredited by the South African Quality Authority (SAQA) and contributing to our skill sets as well”. These training programmes are seen critical and enable employees to adapt faster and more quickly to new changes in technology. This indirectly implies that involving companies in formal curriculum design for TVET qualification may have positive outcomes in terms of employment and this is consistent with the literature reviewed in Chapter 3.

For trade union representatives in six companies, company-based training gives a sense of appreciation by the company and workers feel that they are in control of their work and understand it better. As a result, explains the acting human resource director from Company 1, “this results in productivity increase, waste reduction, and the general quality of products by minimizing defects in tasks execution”. Non-formal company-based training taking place in-house helps workers to re-commit towards work, develop a positive attitude, and for the HR director from Company 6 “it is also helpful in terms of employee behavioural change: absenteeism and late-coming to work”. Non-formal training also helps in terms of boosting staff morale and coping with work pressures. While the majority of companies recruit external artisans, some suggested that they develop their artisans (through apprenticeships) internally through various stages of development from tool-making to maintenance with intense and vigorous training at the first and second-year levels.

7.6.1 The Union's perception of company-based training

While management was united on the view that non-formal company-based training helps to bridge the skills gap, there were divergent views from unions on the role various forms of training provided by companies. As indicated above, union representatives in five component suppliers and one OEM supported the management perspective that non-formal company training helped them to perform their tasks more simply and better, and that it enhanced their performance. However, union representatives from Company 2, 3, 4, 6, and 7 had a different view from that of their management and reported that this type of training was not relevant or helpful.

These union representatives perceived training that companies provide as not of the correct quality and standard to equip workers with the relevant skills necessary to cope with workplace transformation, or with what has come to be referred to as the fourth industrial revolution. For them, companies undertake training just to comply with government legislation and not to address skills shortfalls or gaps. This was confirmed by the trade union representative from Company 7, that "besides the legislated training that is mandatory for companies, when it comes to skills programmes and reskilling the workers the company is failing in that regard".

For the trade union representative from Company 2, an OEM reported that "the training provided to employees is irrelevant with regards to technology advancement". Another trade union representative from Company 6 said: "The issue of training in the company is problematic for us because employees particularly supervisors, operators, and setters get sent to undertake 5S training which offers no developmental trajectory in terms of skills, besides mandatory induction training".

The union(s) perceived the training that the company provides as not in tandem with technological changes and industry 4.0 at large. While there is automation taking place in production, companies didn't provide the skills to

enhance and embrace new technologies.

7.6.2 Importance of skills levy at a company level

In this section, I show the significance of funding for training that includes not only company-based training but also provides funding for employees who wish to study to further their careers on company-related programmes. The skills levy is acknowledged by the majority (ten) of companies, even if they differ on how it helps them regarding training. For instance, five companies reported that the skills levy plays a critical role in terms of training needs, and without the levy, they would not be able to run their skills training programmes, such as apprenticeships and learnership.

The additional two-component companies (6 and 9) though acknowledge the existence of the levy; they, however, perceive it to be insignificant and making no difference, and that they provide training on their own. Explaining the insignificance of the levy, the HR director from Company 6 reported that “the MerSETA grant for training is not sufficient to drive our training needs, it does not make any difference at all, so we would train our employees even without government incentive”. Another three component companies (5, 7, and 8) perceive government grants to have not influenced their training at all and they train according to their skills needs at the time, not to address the country’s skills shortfalls. In this regard, the production manager from Company 5 reported “we do not train to address South African skills problem, it’s the government problem, not this company’s problem”.

Corresponding with this view the HR director from Company 5 reported that their training was determined by the needs of a particular period, not necessarily to address the country’s skills perceived problems. These component suppliers seem to rely on their head office in terms of financial resources to reskill or transfer skills, and this was revealed by the HR director from Company 5:

Our head office in Japan provides the resources for training, so for us,

we train skills we want for that moment, not because there is a skills problem in South Africa, thus whether government support or not it makes no difference. (Interviewed on the 25th November 2019)

In the case of the last component supplier, the senior management reported that they did not rely on government funding. The production manager from Company 3 said that they “will have to explore this because the training of employees is expensive to be only funded by the company finances alone.”

Summaries by cases

All companies, even those that had not grown (Company 9, 10, and 11), had introduced changes in technology, product change and work organization. Although Company 3 and Company 8 had not necessarily bought new machines, the first has manufactured its own equipment utilizing technicians' skills, and the latter has re-modelled the existing machines inserting new features in line with customer demands and specifications.

Introduction to new technology was seen by all companies, including those that had not grown, to be crucial in speeding up the production process, improving efficiencies and productivity. There was unanimity in all companies that skills were not key drivers of industrial transformation.

Case studies have shown that customer demands and product specifications, industrial policy, competition, new government regulations on emissions, research and innovation, are key driver of industrial transformation and appear critical in influencing skills contribution. These changes in technology have led to a surge in employment opportunities, and this was confirmed by two OEMs, (Company, 1 and 2) and six component suppliers (Company 3, 4, 5, 6, 7, and 8) that had employed more people and demanded new skills. These are the same companies that reported to have grown. The surge in employment was also confirmed by union representatives in these companies.

7.7 CONCLUSION

The chapter has indicated that skills play an important role in the context of technological changes, but do not drive company transformation. On the contrary, the chapter shows that changes in terms of technology are the key drivers of skills. The changes in technology are rather driven by other underlying factors namely, clients' product demands and specifications; the national industrial policy; research and innovation; global market forces and price volatility; competition amongst companies that manufacture the same products; and new regulations on emission(s) demanded by the government through the industry, which are getting stricter.

The industrial transformation has been gender inclusive albeit companies also acknowledge that a lot needs to be done to address gender disparities at a higher level. Although there are variations from unions, company- based training is seen as important to address the skills gap in the context of the new technology to improve the performance of the workforce, to enhance working conditions' helps in terms of product defects and reduced wastes, and to improve productivity; and thus many companies invest in skills programmes to bridge the skills gap.

Lastly, the chapter shows the importance of the skills levy although there are variations especially amongst components suppliers on how it helps companies regarding training. There is acknowledgment that the skills levy play a critical role in terms of training needs, and without the levy, Company 1, 2, 4, 10, and 11 would not be able to run their skills training programmes, such as apprenticeships and learnership. The next chapter focuses on growth patterns in the automotive companies over the last five years (2014-2019).

CHAPTER EIGHT: INDUSTRIAL GROWTH AND SKILLS NEXUS

8.1 CHAPTER OVERVIEW

In this chapter, I focus on the relationship between inclusive industrial growth and skills to determine whether TVET programmes that focus on higher skill levels contribute to growth. The chapter responds to question number two addressed in Chapter 1: Are Technical Vocational Education and Training programmes that focus on higher skill levels more likely to contribute to inclusive company growth and transformation? It further responds to research question number two asked in Chapter 4: What are the underlying factors that shape or influence skills contribution to company growth and transformation? The case studies results suggest that industrial growth, which has been inclusive in terms of gender, is driven by critical factors such as (1) technology, (2) workplace relations between employers and employees, an integral part of growth, this relationship manifesting itself in the work reorganization process and technological change (3) exposure to domestic and export markets, (4) increase in clients, and (5) industrial policy, not higher skills levels. It is these critical factors that shape skills contribution to industrial growth.

There is consistency between the survey phase and case studies about growth and transformation trajectory, which confirms that skills are not the key condition for companies to grow and transform. The case studies further indicated that industrial growth deficit (negative growth) as reported by components suppliers (Company 9, 10, and 11) had been driven not by skills but other factors namely, (1) a fragile domestic economy which was perceived to have had a negative knock-on effect on companies; (2) the stiff competition that existed in particular amongst different component suppliers which led to a lack of customer attraction to buy company products; (3) a decrease in terms of sales due to low demands from clients, which had negatively affected production which had also shrunk; (4) due to low production, productivity was affected and the export base was diminishing as

a result; and (5) global dynamics within the value chain which had also led to growth constraints.

8.2 FACTORS THAT DRIVE COMPANY GROWTH

As I have indicated above, in this section I explain in detail the factors that drive industrial growth, and in so doing the section responds to question number four discussed in Chapter 1: What are the underlying factors that shape or influence skills contribution to company growth and transformation? I argue that formal high level skills do not drive industrial growth; it's rather these factors namely, exposure to domestic and export markets, increase in clients or customers, changes in technology, healthy relations between employers and employees in the workplace, and industrial policy that drive industrial growth.

8.2.1 Exposure to domestic and export markets

There seems to be a growing trend in eight companies, namely Company 1 and 2 (the OEMs) and Company 3, 4, 5, 6, 7, and 8 (the components suppliers) to view exposure to local, regional, and global markets, which they reported had increased, as driving growth. This was confirmed by the HR directors and production managers in these eight companies. For instance, the acting HR director from Company 1 reported that:

Our expansion into the continental markets in countries like Kenya, Rwanda, and Nigeria has played an important role in relation to our growth and also resulted in changes in the mode of production with the introduction of new machines, automation, and product re-adjustment. (Interviewed on the 14th October 2019)

The production managers and acting HR in Company 1 seem to be aligned in views, as they both share similar perception on the importance of exploring regional and global markets to increase sales, exports, and employment.

Consistent with the acting HR director's perception on regional and global markets, two production managers from Company 1, one male and one woman [both Whites] also confirmed that:

Exploring African markets and other regional economies in Europe and the US has led to an increase in car sales and employment, resulting in new people at both levels [mid and higher] being employed albeit with new skills. For us, as we grow in terms of sales, clients, and expanding, business skills are important when we employ. (Interviewed on the 14th 2019)

Export markets for these eight companies and the automotive sector broadly are perceived as important to drive sector growth. Moreover growth in export is perceived as critical in promoting product specialization for the OEMs, and that enhances productivity in the workplace. As a consequence, most companies export more products to global markets than they do to domestic markets. Essential to the export growth is the industrial policy, which appears to play an important role to drive and sustain company expansion. Confirming this, the production manager from Company 2 reported that:

An increase in exports is important for any economy, not only the industry, because it guarantees demands for the country's product/output and may, in turn, increase real economic output and this is in line with the Automotive Production Development programme which replaced the MIDP. (Interviewed on the 7th October 2019)

The importance of industrial policy in relation to industrial growth is confirmed by all companies, even those that reported growth constraints or deficit, and that the Motor Industrial Development Programme (1995-2012), the Automotive Production Development programme (2012-2020), and now the Automotive Master Plan (2020-2035), adopted in 2018 have played a

significant role in growth trends over the years in terms of employment, exports and sales.

The HR director from Company 4 perceived the national industrial policy to be crucial even, though she reported that “As a foreign-owned company, there are some challenges we are faced with i.e., [being] unable to meet certain targets in terms of BBBEE scorecards to continuously benefit from the government grant”. The role of the national industrial policy seems consistent with the literature reviewed in Chapter 2 in relation to employment, sales, and exports to boost economies of scale and increase production volumes in the sector (Barnes & Black, 2013; Lamprecht, 2009; Mashilo, 2010; Masondo, 2018). Despite price vitality and exchange rates in the global market, exposure to various economies and industrial policy is perceived to have enhanced industrial growth in most companies. Even the newly adopted Automotive Master Plan for 2020-2035 is based on the sector's growth trajectory, upgrading the technological base, pushing for localization, and improving competitiveness, all of which are important for job creation. In this instance, I argue that the push for localization is based on the assumption that it is likely to improve competitiveness which as the case study findings showed is tight, especially among the component suppliers. This is likely to happen if the increased local content is sourced at competitive global prices. This is also in line with the literature reviewed in Chapter 2, that developing local content and increasing employment are key government policy objectives and at the very core of the underlying reasons for government support for the industry (Barnes et al., 2018; Department of Trade and Industry, 2011, 2018; Lamprecht, 2009; The Department of Trade and Industry, 2012).

8.2.2 Clients' Increase

An increase in the clientele base is another critical driver of industrial growth. Firstly, this increase in customers is attributed to the quality product that companies provide, which is enhanced by changes in technology and

effective skills utilization in the work-organization process which has enabled production expansion, boosted productivity, and increased sales. This was confirmed by the production managers from Company 5 who revealed that “we have become more efficient to respond to product specifications by our clients as a result of skills utilization in line with our technology”. The effective use of skills in the context of technological changes has become an integral part of efficiency and growth, thus in Chapter 7, I argue that there is seemingly a relationship between skills and industrial growth, albeit that skills do not drive it.

Secondly, the new customers attracted by quality products have created more employment opportunities as more contracts and commitment to supply different products to the OEMs result in double production which demands changes in the working shift, leading to more people being employed for both day and night shifts. As a result, HR directors reported that they intentionally utilized this employment expansion to recruit and attract females more than males to balance gender equity and required relevant skills. In this regard, the HR director from Company 5 revealed that:

The company increased its productivity and workforce [to more than] twice the number it had initially with new skills. It increased its workforce from 90 employees to 240 in total across the board, from operators to high management, and we targeted females to balance gender profiles. (Interviewed on the 25th November 2019)

Thirdly, an increase in clients and more contract commitments to supply more products led to an increase in productivity, despite competition amongst component suppliers. The production manager from Company 8 elaborated that: “especially those that come from China who also manufacture shock absorber, ship it here (SA) at 40% cheaper than what the company can

without profit". Fourthly, the surge in clients and more contracts commitment and expansion in shifts led Company 5 to demand or require a national diploma engineering qualification for supervisors as part of sustaining growth and maintaining quality and efficiency.

Confirming this, the production managers from Company 5 reported that "to guarantee ourselves with efficiency and quality in product, we now require supervisors to have a diploma in engineering qualification". The demand for high skills finding directly responds to question number one addressed in Chapter 1: To what extent do formal TVET programmes contribute to industrial growth and transformation? This is because, at a higher level, employees perform complex and diverse tasks, thus all HR directors and production managers in these eight companies emphasized the importance of formal skills programmes at a higher level to enable company growth.

One of the eight companies, the car manufacturer (OEM) Company 2, reported having shrunk in the survey results in terms of product demand because of the global dynamics, leading to its losing one of its car models, and the market share dropped significantly, especially in the USA. This was because of the USA neighbouring country (Mexico) which was also supplying the same model to the USA and more cheaply than South Africa, thus the stagnation in terms of demand. However, as the case study revealed in Chapter 6, Company 2 has grown because of the new model the company is now manufacturing, which has boosted the company's growth. Illustrating this is the human resource manager from Company 2 who reported: "The new model being manufactured has resulted in positive growth ... thereby increasing employment as the production volume increased". With the new model, the HR manager from Company 2 continued: "We now supply the whole European region, thus production volume, markets, and employment grew tremendously over the years, although the USA is still the market base but on a different model". However, the union representative in the very same company offered a different view about the company losing one of its car

models. He indicated that:

The reasons to let go of manufacturing the previous model to one of the European countries were rather political more than anything. Due to free tax associated with BRICS countries, the company head office in Germany exploited this loophole, as it won't cost much to manufacture the new big and expensive model in South Africa, which can be easily exported back to other countries at tax-free costs. (Interviewed on the 7th October 2019)

Despite these divergent views in this one company, overall there is an agreement about the close correlation between sales increase, export market, and the overall performance of the economy, all of which are centred on company and client confidence levels. Lastly, there is convergence, especially from all senior management and production managers, and which unions support, that sound and healthy workplace relationships between employers and employees are also an integral part of company growth, which manifests itself in the work reorganization process and technological changes.

8.2.3 Technological Changes

The introduction of technology in the production line has not led to the retrenchment [application of section 189 of the labour law act] of employees; on the contrary, it has led to more people being employed albeit with high skills.

Thus, as explained in the section just above, group leader positions/supervisors are now required to have an engineering diploma for the component companies. Explaining this new demand for diploma engineering qualification, the human resource director from Company 7 reported that “engineering qualification specializing in electronics, fitting and turner and millwright is important for us to work with machines to drive growth”. The company

reported that these new skills at a higher level are crucial to keep up with technology changes to support growth. Companies further re-skill or retrain employees at lower level in the context of technological changes, which is crucial for company productivity/growth and this is consistent with informal on-the-job training discussed in my analytic framework. Confirming productivity increase, the HR director from Company 6 revealed that:

As a result of reskilling our workforce at an operator level in the context of new technologies we have introduced, we have seen tremendous growth in wheels manufacturing, such that we moved from one million products per annum to over 1, 6 million annually, and we are making a profit in this regard. (Interviewed on the 16th October 2019)

Despite the global challenges which affected Company 6 in terms of the order book, which according to the senior management “was shrinking”, meaning fewer companies were making orders, production had increased quite significantly because of new machines introduced and reskilling of employees. Furthermore, the new technological instruments seems to have enabled companies to adapt quite rapidly and take full advantage of foreign linkages. As more jobs attributed to technological innovations are created, companies demand high skills training programmes, particularly at a higher level, although reskilling lower level continues.

8.3 COMPANY GROWTH CONSTRAINTS

While Company 1, 2, 3, 4, 5, 6, 7, and 8 reported to have had a positive growth as discussed above and in Chapter 6; Company 9, 10, and 11 have had negative growth. In this section I discuss growth constraints at a company level. I show that whilst skills do not enable industrial growth, they also play no role in enhancing growth constraints. Rather, the following factors influence constraints.

Firstly, the growth deficit has been driven by the fragile domestic economy which is perceived to have had a negative knock on these three companies. Secondly, the stiff competition that exists, in particular amongst different components companies, is perceived to have also led to a lack of customer attraction to buy company products. These two findings are consistent with the literature reviewed in Chapter 2, according to which the poor performance in manufacturing and the economic problems, in general, have led to many companies failing to attract clients for the products they produce because of the stiff competition amongst the different components companies (Department of Trade and Industry, 2011, 2018).

More broadly, the constraints in these three companies are consistent with the policy reports and documents reviewed in Chapter 2, that the domestic economic performance since 1994 has been lacklustre, particularly in manufacturing (Department of Trade and Industry, 2011, 2018). Thirdly, there has been a decrease in terms of sales due to low demands from clients, and this has negatively affected production which has also shrunk.

Fourthly, due to low production, productivity was affected and the export base diminished as a result. The fifth driver is global dynamics within the value chain which have led to constraints. In this regard, HR directors in these three component companies collaborating with production managers mentioned global dynamics mainly the "Diesel-gate scandal", which they reported to have taken place in 2014.

They reported that the "Diesel-gate" was engineered globally [not in South Africa] by one of the major international OEMs [which also participated in the study], in its head office. This scandal had negatively affected companies, especially the component suppliers, thus the three companies were unable to grow. Confirming Diesel-gate, the HR director from Company 9 indicated that "we have experienced turbulent five years of external factors that were

beyond the company's control in terms of the market". As a consequence of this scandal, which was beyond domestic companies' power and control in terms of the global market, the demand for diesel significantly dropped leading Company 10 to close down some of its operations, and that negatively impacted employment. The HR director from Company 10 reported that "the new alternatives to increase clientele bases, thus boost sales, didn't help us to grow. As a result, the sales dropped significantly, because the demand was low, thus production decreased, and exporting products were severely affected". Although Company 10 reported to have acquired or bought another company to sustain existing business with its clients, according to its HR director that also did not make a difference to growth. Explaining the context in which it took place, the HR director from Company 9 revealed that the Diesel-gate scandal had taken place exactly five years previously [2014].

So, one major global OEM [which participated in the study, both in the survey phase and case study phase] which was our major client, was central in orchestrating this corruption. Although the GCEO of this major OEM globally ended up in jail, the effects of this scandal did bring our core-business function to its knees, and one of our production sites was closed, affecting our growth trajectory in terms of sales, exports, and employment. (Interviewed on the 17th October 2019)

There is trend in all three companies that Diesel-gate fundamentally altered their growth, which as continuously shown led to a significant drop in clients and sales as a result of low demand, and exports. As a consequence, the HR manager from Company 9 reported that "we could no longer produce 100 units of petrol and diesel respectively, and it dropped to rather 20 units". The production manager in the same company concurred with the HR manager that "these are external macro-global economic factors that were beyond our scope which significantly tempered ... our growth". However, the HR directors in Company 9 and 11 reported that the government incentives and

Automotive Production Development Programme had helped to win new contracts to be major supplies of OEMs in the previous two or three years. This finding suggests that the national industrial policy plays an important role for companies to grow.

Sixthly, the lack of high and modern technology equipment compared to competitors contributed somewhat to the growth deficit and affected productivity levels; as a result, the staff morale had been low because of the fear of losing jobs as the business was not growing. These companies were picking up now, and they acknowledged the role of the industrial policy which pushes them to localize, and that it had not been to blame for their sluggish growth.

8.4 INDUSTRIAL STRATEGY AND SKILLS STRATEGY

In this section, I show the companies' perception of the relationship between industrial policy and skill strategy. The case studies from six component suppliers revealed the need for alignment between industrial policy and skills strategy to impact economic growth; and their involvement in this regard is crucial. This was confirmed by the HR director from Company 7 that "TVET strategy has to be embedded [in] industrial strategy for the overall economy's growth".

Company 8 reported that "the country cannot have a great industrial policy that encourages growth and development of the industry to re-invest in the economy, yet nothing is connecting that with skills whose utilization is crucial for sustaining growth". Furthermore, The HR director from Company 5 reported that "there is a lack of implementation from the government and for as long as government strategy and that of industries in South Africa are not in sync, challenges of unemployment and skills will persist in South Africa". Company 3 reported that "education and training policies have to be fundamentally

interlinked with the industrial strategy to drive economic growth". Companies recognized the support of TVET colleges by the government, which is consistent with the literature reviewed in Chapter 2, that many countries worldwide even on this continent have developed various policies to support technical and vocational education and training for technical skills in the economy (Allais, 2020).

8.5 COMPANY GROWTH AND GENDER INCLUSIVITY

As discussed above, this section gives more detail about gender inclusivity in relation to growth. I show that as companies grow they intentionally employ females to address gender inequalities and also to diversify staff profiles. Human resource directors in all companies reported that as they grow in terms of employment they employ females at various occupational levels, not only for compliance with equity plans meant to address the gender injustices of the past but also to diversify their staff profiles.

Diversification of staff profiles to represent the South African demographics seems to be important for companies in terms of race and gender. Confirming this, the HR director from Company 3 reported that:

As an international component supplier company, diversification of our workforce is highly crucial for us. In some departments the representation of women is much better. For instance, our laboratory department which is dealing with chemicals and analytical chemistry stuff, is predominantly women. (Interviewed on the 18th October 2019)

At the maintenance department there was a serious shortage of women, especially for the component suppliers. The production manager at Company 3, however, reported that "we have had instances ... at the maintenance department [where] women were in the majority compared to men, so it is not as if there is a policy to discriminate candidates based on gender". Importantly, the HR director from Company 7 indicated that "skills are crucial,

not gender: however, all the females we have employed met our skills requirement for the jobs”.

Some component suppliers have recruited women to empower and train for high-level positions such as artisans and technicians. In this regard, the HR director company 11 revealed that “We recruit females to empower them”. She continues: “I mean we just hired a female artisan who finished her trade test as an electrician and we are proud of her, and we also have female millwright artisans”.

Companies indicated that women themselves have now realized that there is nothing they can't do in the industry. The HR director from Company 7 revealed that “the manufacturing industry, not only the auto, has been over the last three decades dominated by males. Thus we recruit women to close the gap”.

There is, however, convergence amongst HR directors and production managers in all companies that the automotive sector is faced with shortages of women at a high skilled level. Although females are working as artisans, production managers, and supervisors the number is too low compared to male counterparts, thus companies are seized with various programmes to address gender imbalance. According to HR director from Company 8:

Ladies that are being trained or studying towards being fitters, millwright, and tool & boiler making, are not aware that (depending on the nature of the company) this career demands of you to work and lift heavy tools and machines. I think society and schools need to guide them, especially women, to know the actuality of the engineering field, because sometimes when they get to the working environment, they are shocked to see that you get dirty lifting heavy machines. (Interviewed on the 15th October 2019)

The union representative in Company 6 shared similar sentiments that in some departments the nature of work demands physical fitness and strength, thus companies hardly employ females in those departments: He says:

They [the management] do try to hire females sometimes, but in supervisor positions, and [in] setter positions there are no females. To be honest, in this plant the operation requires more physical strength. So in foundry and melting, the nature of work demands physical strength, there is heat there, so the people that become supervisors come from there, but for only those two departments, hence we don't have females. (Interviewed on the 16th October 2019)

The shortage of women in engineering and science fields that reflect in technical positions is seen as a societal problem. The HR director from Company 4 reported that “the lack of females in technical fields is a country's problem, not our problem, and we are trying our best to address it”. She continued:

We have adopted schools around this area of Pinetown and New Germany through our Corporate Social Responsibility. We use our mobile laboratory visiting schools to conduct science experiments. If they perform well we take them to the university; that is how we build them for the future. Talking to you now, we have one candidate now based in the Germany Institute of engineering. (Interviewed on the 27th November 2019)

While there is no discrimination against females in any position, component suppliers admitted that a lot needs to be done to make sure that their gender profile is improved both at the technical level and management level. They reported that all stakeholders i.e., industries, government, and civic society are duty-bound to ensure that women are empowered through Science, Technology, Engineering, and Mathematics (STEM) fields.

8.6 GROWTH AND EFFECT ON WORKING CONDITIONS AND PERFORMANCE

As explained above, in this section I focus on the extent to which company growth improves working conditions, wellness and performance of employees. The case studies showed that company-based training i.e., non-formal training, informal on-the-job training, induction training, and formal dual training presented to the employees have enhanced their performance.

These types of skills available at company level are often not credited against national qualifications, yet they help a great deal for employees to problem-solve and think independently and critically. In addition, soft skills such as the right attitudes and commitment towards work enable performance.

While companies reported divergent views on the Likert scale questions on whether mid-level employees with TVET qualifications need less supervision when working compared to those with no formal training, they all agreed that employees at higher-level need less supervision compared to those with no formal skills training. The Likert scale responses also showed that candidates with TVET qualifications can work and adapt faster with great accuracy against those with no formal training. This is even acknowledged by the component suppliers such as company 1, 4, 5, 8, and 10, who reported not to consider TVET for hiring at any level because of its weaknesses and poor quality. In addition, all HR directors and production managers reported in the Likert scale that people with formal qualifications cause fewer defects in products and therefore reduce waste compared to those with no formal skills training. Essentially, informal on-the-job training at an MSE level also contributes to waste reduction and causes few defects.

Improving the working environment in the context of work re-organization has led to an increase in productivity. In some workstations, the HR director from Company 6 reported that “the introduction of driveways and walkways has

also improved working conditions". The working environment is seen to have improved from new technological changes. The human resource manager of Company 2 elaborates that the "working environment has become ergonomic friendly, and employees are also encouraged to report any physical challenge, be it back pains or any sort that they are experiencing as a result of new machines". To prove that the working conditions have improved the performance of employees and enable a stable working environment, the HR director from Company 3 reported that:

Our technicians have built a new coating machine for us, and none of our sister plants in Germany, China, Poland, have a machine like the one built by our technicians. As a result, our guys here at an operator level are training and teaching those Polish operators to operate this machine, which we have built here in South Africa. So one of our sister plants in the US has given us the responsibility to manufacture 300,000 different parts using the coating machine, because of the high demand by the OEMs in the US. (Interviewed on the 18th October 2019)

The HR director from Company 3 added:

This coating machine is different from these other machines and customers require it in the US, for Ford in particular. It took some foresight from our technicians to come up with a new machine built in SA by our technicians. Our employees are learning how to operate their machine and this generated a higher spirit and commitment towards work. (Interviewed on the 18th October 2019)

8.7 CONCLUSION

The chapter argued that growth which the majority companies have experienced has been gender-inclusive. The chapter further showed that industrial growth is not driven by skills. It is rather critical factors, namely, customer product specifications, client increase, exposure to domestic and

global markets, healthy relations between employees and employer, and technological changes that drive industrial growth. It has also shown that lack of these factors including competition, and fragile economy, a decrease in terms of sales due to low demands from clients, and global dynamics within the value chain contribute to negative growth, not skills.

Vocational training taking place in the workplace, albeit not credited against national qualifications, has enhanced employees' performance. In addition, these company-based training programmes help a great deal for employees to problem-solve and think independently and critically. Skills strategy has to be aligned with industrial policy to play a meaningful role in growth. Skills alignment with industrial policy is crucial for companies especially in South Africa which has a great industrial policy that encourages growth and development of the industry to re-invest in the economy. The chapter confirms the existing debates in literature around the complex nature of the skills formation system. It further confirms that there are contextual factors that seem crucial in understanding or influencing the skills formation system.

CHAPTER NINE: CONCLUSION AND RECOMMENDATIONS

9.1 CHAPTER OVERVIEW

In this chapter I provide an overview of the main argument and conclusions of the thesis. I then consider the limitations of the research, explaining the weakness and finally discuss the contribution that this research to knowledge.

9.2 SUMMARY OF THE ANALYSIS

As discussed in Chapter 1, I focused on the automotive manufacturing sector to understand the companies' perception of formal TVET training's contribution to inclusive industrial growth and transformation. My central research question was: What are companies' perceptions of the contribution of formal Vocational Education and Training programmes to industrial transformation and inclusive growth? I was interested in the formal training held pre-employment, and those programmes acquired in-employment by the five categories of workers also all explained in Chapter 1.

The aim was to explore the linkages between TVET formal skills, and growth and transformation; as well as whether skills programmes that are focusing on high skills are more significant than others, and which specific programmes are seen as most relevant by companies. My answer is: Formal TVET programmes do not contribute to inclusive industrial growth and transformation. They play an additional role; they are not central. In other words, none of the eight companies that reported to have grown mentioned skills, nor did skills cause the growth constraints as reported by three component suppliers, namely Company 9, 10, and 11. The thesis has shown at MSE level, matric certificate with maths and science is important at a point of hiring, although it doesn't address company skills needs. Different type of training in-house help companies at this level to address skills. Thus ability to read and writing, which matric certificate signals is more important.

At HSE, the thesis has also shown that formal qualification helps companies to address skills needs, and HSEs also undergo different set of company based type of refresher training courses, and other informal-on-the job training. Moreover, some HSEs particularly artisans and technicians get trained through fully accredited dual-training programmes also known as apprenticeship training that companies provide. Companies reported to have grown and transformed without skills. Once growth and transformation has taken place, companies require skills.

Industrial growth is driven by different critical factors—industrial policy, exposure to domestic and global markets, increase in clients, changes in technology, healthy relations in the workplace between employers and employee, which manifests in work organization process, and competition amongst companies that supply same products. A growth deficit as reported by Company 9, 10, and 11 has also not been driven by skills but different factors: The fragile domestic economy is perceived to have had a negative knock on these three companies; the stiff competition that exists in particular amongst different component suppliers is perceived to have led to a lack of customer attraction to buy company products; a decrease in terms of sales due to low demand from clients negatively affected production which has also shrunk; due to low production, productivity was affected and the export base diminished as a result; global dynamics within the value chain led to constraints; and a lack of high and modern technology equipment compared to competitors' has somewhat contributed to growth deficit and affected productivity levels.

Industrial transformation is also not driven by skills. All companies reported to have had transformation in the workplace in terms of technology, work organization, and product change - none of them mentioned skills as central to these changes. They also mentioned different factors namely, customer specifications and demand; technology, research and innovation often

implemented by parent companies; industrial policy; competition amongst companies that supply same products; and new regulations on emissions demanded by the government through the industry, which are getting stricter especially for the component companies. Skills programmes that focus on higher levels are seen as more important once growth and transformation have taken place, particularly when new technology has been or is being introduced.

In terms of inclusivity in the automotive sector, there is a shift towards inclusivity in the sector, both in terms of hiring more Black African workers in skilled positions, and in terms of women making inroads into the sector. I could not find evidence that skills were driving this shift. It seems from my study that inclusivity is primarily driven by employment equity legislation; it also seemed as if companies recognize the social imperative for inclusivity and there seems to be a consensus between senior management and trade union representatives that women's participation, especially at a higher level, is still not at a desirable level.

9.3 REFLECTIONS

The literature review showed how industrial policy has supported industrial transformation and growth. It is encouraging that representatives from all the companies discussed confirmed that recent national industrial policies have encouraged and supported skills training. Recent industrial policy supports training, and also supports companies to change technology, and to increase employment, sales, and export. My study was not testing the implementation or success of industrial policy per se. Nonetheless, it offers some insights into this issue, as representatives of all companies spoke about its crucial role in supporting their survival or growth.

Given that the policy encourages and supports companies to introduce and adopt new technology to remain internationally competitive, and given that I have established that skills are seen as important once technology has been

introduced, I can infer an indirect relationship between skills and industrial policy in the automotive sector.

The literature reviewed also showed that new technological changes have rather led to reskilling and upskilling in the workplace. It is encouraging that senior management and the majority of trade unions representatives in all companies discussed confirmed that changes in technology led to upskilling and reskilling rather than application of section 189 (retrenchment), although three trade union representatives had a different view from the rest. At MSE level, training that companies provide is more formally structured, and helps with skills needs, whilst at HSE level, the training is more about refresher courses, as candidates are perceived to be fully equipped and qualified. There does not seem to be a need to differentiate between them when thinking about training. Given that changes in technology drive upskilling and reskilling of workers, and more component suppliers also require solid formal qualification even for supervisors, I can infer an indirect relationship between skills and changes in technology and work organization in the automotive sector.

Research literature has argued in the past that the sector is faced with technical skills shortages (Du Toit & Roodt, 2009); research commissioned by policy bodies suggests that this is still the case, and the research findings also confirmed the existing literature that artisans and technicians are critical skills that the industry is battling to source in the labour market. A key policy body in South Africa argues that collaboration is important to solve skills shortages; this resonates with a large of research literature internationally that shows how countries with more coordination among employers (and sometimes unions) frequently have better training outcomes.

The thesis seems to confirm the literature that building practical collaborations between industries and colleges, and embedding this in national industrial policy can help align curriculum content and teaching methodologies to

ensure learning outcomes correspond to the human capital needs of specific industries.

This will further address structural and institutional weaknesses, such as teaching personnel who often lack industry experience, through enhancing their knowledge and skills and being more innovative in their ability to work. More broadly, the literature showed that skills is complex. Skills are acquired in different ways and skills vary even within companies with similar economic indicators. It's interesting that all the companies discussed confirmed that beyond formal qualifications, which contribute to skills needs to a certain degree, there are other, different types of training which are non-formal and company-based and seen as crucial for skills needs i.e., induction training, informal on-the-job training, formal dual training for MSE and HSE, and the secondary schooling certificate.

9.4. LIMITATIONS AND RECOMMENDATIONS

The study mainly focused on a specific sub-sector of the manufacturing sector, which is the main limitation and also does not speak/represent the sector as a whole but for the companies that participated in the study. Similar research may be carried into other sectors or even the state-owned companies to understand how, for instance, TVET linkages with Transnet and Eskom during the mining industrialization process worked in terms of the technical skills required by the growing mining sector at the time. This will enhance and help the state on how to restructure TVET programmes or a skills system in partnership with the industry, and the extent to which an industry-TVET alliance can be forged that is more practical.

Assessing how linkages can be forged between TVETs, private providers, and companies, with overall linkages to macro-economic policy is crucial for providing more insights into the extent to which TVET colleges and their programmes could be reconstructed to play a meaningful role in society and

the economy. A similar approach could be undertaken —especially with TVET educators or teachers in the engineering departments— to gain exposure and practical experience in various companies in the manufacturing sector. This could be undertaken by bringing back to the system the retired cohorts, White males with technical skills i.e., technicians, artisans, welders, plumbers, electrician machinists, and setters who got trained through the dissolved motor industry training board, replaced by the SETAs. They could play a role in amplifying the technical aspect of the skilling system in the South African economy. This research has shown that concerted efforts and practical initiatives forged at a policy level between different stakeholders in the education and training i.e., industries, education providers (private and public), and the state are important. Furthermore, the policy debates related to improving the quality and relevance of TVET programmes and provision systems and strategies have to be more nuanced to enhance skills utilization to the industrialization growth nexus. The thesis recommends that a skills strategy should be embedded in the national industrial policy to have a meaningful contribution to the industrialization growth nexus. It further recommends as crucial the consideration of factors that shape skills formation at a company level when formulating skills policy.

9.5 CONTRIBUTION TO KNOWLEDGE

In this section, I reflect on the contribution that this research makes to the existing knowledge on the skills formation system literature. As discussed in Chapter 1, there is insufficient insight or a gap in the literature about the role that skills play in the context of industrial growth and transformation. Chapter 1 also argued that in most instances, the literature on impact evaluation that focuses on skills training programmes looks at how education and skills benefit

individuals in terms of employment and income, with little analysis of how these skills programmes help companies to drive economic growth and inclusive transformation. This research was conducted to give insights on whether skills contributes to industrial growth and transformation in the automotive manufacturing sector in South Africa. The study moves the literature to new directions as it provides answers to pertinent questions: What are companies' perceptions of the contribution of formal Vocational Education and Training programmes to industrial transformation and inclusive growth? In response to this question, it argues that skills do not contribute to industrial growth and transformation. In other words, none of companies that reported to have grown and transformed mentioned skills as an important driver. Skills certainly play an additional role; they are not central. Even when companies experienced negative growth or growth deficit—as reported by company 9, 10, and 11—skills have had no contribution in this regard.

Skills as elaborated in both chapter 7 and chapter 8 which is consistent with chapter 5 are perceived to play an additional role, they are not central. The thesis further answers the questions around the underlying factors that influence growth and transformation but also shape the contribution of skills to inclusive growth and transformation. It revealed that industrial growth and transformation is driven by different factors, namely, industrial policy; exposure to domestic and global markets; increase in clients; changes in technology; healthy relations in the workplace between employers and employee, which manifests in work organization process; and competition amongst companies that manufacture the same products.

The thesis confirms and contributes to the existing global body of knowledge that the skills formation system is much broader and complex than the narrow notion of demand and supply (Allais, 2015; Bosch, 2017; Busemeyer & Iversen, 2012; Porter, 2003). As a first contribution it argues that to understand the skills formation system as a whole it's important to study company level dynamics

to understand factors that crucial not only to influence growth, but also in shaping skills regime at a company and industry level.

Moreover, the thesis has shown that skills training provision happening at a company level although non-formal against national qualifications has a considerable role in the expanding skills set and knowledge of workers, especially MSE, and help companies when it comes to skills needs; and companies further provide non-formal training— even to formally qualified cohorts to upskill them for workplace changes in terms of technology. The seeming consideration of private providers in instances where there is no internal capacity in component companies in terms of education and training, not TVET training especially, in a way suggests the value in understanding exactly what is it this provision arrangement has that the automotive companies, embrace, which doesn't happen with TVET formal provision.

Thus, as a second contribution, the thesis argues that rethinking the formalization of TVET skills provision in South Africa is crucial to consider other forms of training that are seen valuable at a company level. This rethinking of TVET provision will position the sector and more general education service providers to design with company involvement and deliver vocational programmes that play an outcome-based role in the overall economic growth trajectory. Lastly, building practical collaborations between industries and colleges, embedded in national industrial policy, can help align curriculum content and teaching methodologies to ensure learning outcomes correspond to the human capital needs of specific industries. This will further address structural and institutional weaknesses, such as teaching personnel who often lack industry experience, through enhancing their knowledge and skills and to be more innovative in their ability to work.

9.5 CONCLUSION

The thesis has revealed that skills do not drive industrial growth and transformation in the South African automotive sector. It is rather different factors such as industrial policy, technology, customer demands and product specifications, an increase in clients, and global external factors within the value chain that contribute growth and transformation. All the companies discussed confirmed that recent national industrial policies have encouraged and supported skills training. Recent industrial policy supports training, as well as supporting companies to change technology, and to increase employment, sales and exports.

It is encouraging that senior management and the majority of trade unions representatives in the companies discussed confirmed that change in technology led to upskilling and reskilling rather than the application of section 189 (retrenchment), although three trade union representatives had a different view from the rest. The company-based training, albeit non-formal, is valuable and helps in addressing skills needs to various degrees. In addition, soft skills are seen as important for companies, and they struggle with these even in people who have formal qualifications at a higher level. In this regard, skills levy grants play a critical role in terms of training needs, without which most component suppliers would not be able to run their skills programmes, such as apprenticeships and learnership.

In instances where there is no internal capacity for training, the seeming consideration of private providers, not TVET training especially, in a way suggests the value in understanding exactly what it is this provision has that the automotive companies' embrace, which doesn't happen with TVET formal provision. Although there are variations on TVET programmes, seemingly most companies consider it at the point of hiring for MSE level, but do not see it as valuable/useful for higher-level employees, because of the perceived

structural weakness. Yet these are the levels where the greatest shortage is seen, and by companies that seem not to consider TVET.

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Appendix A: Request for Permission Letter to NAACAM

Date: 11 September 2018

Dear Mr. Dave Coffey, President of National Association of Automotive Component and Allied Manufacturer (NAACAM)

I am doing a PhD student at Wits University, on a project that the university is in partnership with the National Swiss Foundation, conducting a multi-country study, to understand the contribution of vocational skills development programmes (VSD) to inclusive industrial growth and transformation in the automotive sector in South Africa. More broadly, the study seeks to identify the critical factors that help or hinder the contribution that these programmes make in order to both increase our knowledge in this critical area and to contribute to improved policy in this area. In order to ensure that my efforts are aligned with other processes taking place within the manufacturing sector, I am working actively with key structures such as the Manufacturing Circle as well as a broader reference group set up to discuss skills in the manufacturing sector convened by National Business Initiatives and the Department of Planning, Monitoring and Evaluation. This study broadly forms part of a cross-country study, which includes Vietnam, Ethiopia, Bangladesh, Laos, and Cambodia. It is anticipated that this will further contribute to VSD contribution to the sector development trajectory in South Africa.

I am therefore writing to you to request your participation in the study. I also hope that we will be able to share and discuss findings with you as I make progress in the study. Further, I would like to request that you assist me by encouraging your member companies to participate in this study. If you are willing to assist we will send you a link to the study to forward to your members.

Please be assured the survey is highly confidential and the identity of your member companies and staff will be kept anonymous. Participation in this research is voluntary.

We look forward to your positive response,

Kind regards

Anthony Tolika Sibiya, Wits University PhD Student: Email: tolika.sibiya@gmail.com

Cell: 071 47 11637

Appendix B: Request for Permission Letter to NAAMSA

Date: 11 September 2018

Dear Mr Nico M Vermeulen, Director for National Automotive Association and Manufactures of South Africa (NAAMSA)

I am a PhD student at Wits University, on a project that the university is in partnership with the National Swiss Foundation, conducting a multi-country study, to understand the contribution of vocational skills development programmes (VSD) to inclusive industrial growth and transformation in the automotive sector in South Africa. More broadly, the study seeks to identify the critical factors that help or hinder the contribution that these programmes make in order to both increase our knowledge in this critical area and to contribute to improved policy in this area. In order to ensure that my efforts are aligned with other processes taking place within the manufacturing sector, I am working actively with key structures such as the Manufacturing Circle as well as a broader reference group set up to discuss skills in the manufacturing sector convened by National Business Initiative and the Department of Planning, Monitoring and Evaluation.

This study broadly forms part of a cross-country study, which includes Vietnam, Ethiopia, Bangladesh, Laos, and Cambodia. It is anticipated that this will further contribute to VSD contribution to the sector development trajectory in South Africa.

I am therefore writing to you to request your participation in the study. I also hope that we will be able to share and discuss findings with you as I make progress in the study. Further, I would like to request that you assist me by encouraging your member companies to participate in this study. If you are willing to assist we will send you a link to the study to forward to your members.

Please be assured the survey is highly confidential and the identity of your member companies and staff will be kept anonymous. Participation in this research is completely voluntary.

We look forward to your positive response,

Kind regards

Anthony Tolika Sibiya, Wits University PhD Student: Email:tolika.sibiya@gmail.com

Cell: 071 47 11637

Appendix C: Information Sheet and Permission Form

Thank you for agreeing to be interviewed as part of the research project "Skills for Industry". A University of the Witwatersrand Research Team will conduct the interview.

This form will help you understand the purpose of your involvement and is the basis for your agreement to the conditions of your participation.

Please note that even if you have agreed to participate, you have the right to stop the interview or withdraw from the research at any time.

Data use and analysis

- The interview will be recorded and a transcript will be produced
- The transcript of the interview will be analysed by researchers involved in the project
- Access to the full interview transcript will be limited to researchers involved in the project
- Any summary interview content or direct quotations from the interview that are made available through academic publication or other forms of publication will be anonymized so that you or your company cannot be identified, and care will be taken to ensure that other information in the interview that could identify yourself or your company is not revealed
- The actual recording will be stored electronically
- Any variation of the conditions above will only occur with your further explicit approval

Publication

Parts of the content of your interview may be used:

- In academic papers, policy papers or news articles
- On our website, in other media that we may produce and for spoken presentations
- On other feedback events
- In an online repository

Questions and concerns

If you have questions, concerns or require further information about the research, you may contact the country team leader: Prof Stephanie Allais;

stephanie.matseleng@wits.ac.za / rstephanie.matseleng@gmail.com and
contacted at Tel: 041 717 3353

Agreement

By signing this form, I state that I am voluntarily providing information to the “Skills for Industry” project and that I agree to all of the above-mentioned terms and conditions.

Printed Name

Participant's Signature

Date

Researcher's Signature

Date

Agreement

By signing this form, I state that I am voluntarily providing information to the “Skills for Industry” project and that I agree to all of the above-mentioned terms and conditions.

Printed Name and Position in the firm

Participants Signature

Date

Researcher's Signature

Date

Appendix D: Information Sheet

PHZH 8090 A-S2 Zürich / SWITZERLAND

Education

Department of Upper Secondary and Vocational

Zurich University of Teacher Education

Markus Maurer, Prof. Dr.

Department of Upper Secondary and Vocational
Education

Lagerstrasse 2

8090 Zurich

Switzerland

markus.maurer@phzh.ch

Zurich, 12.04.2018

Research on skills development and industrial growth

To whom it may concern,

The development of vocational skills has become an important priority for governments and the world of work. In fact, the availability of a skilled labour force – especially within the manufacturing sector – is seen as an important pre-requisite for the productive transformation of industrializing economies. The process of industrialization clearly creates new opportunities and can provide skilled workers with access to better jobs and income and might help a society as a whole to prosper.

Despite the growing emphasis on skills development, there is still a substantial lack of evidence on the linkage between skills development and industrial growth. The research project ***The contribution of vocational skills development to inclusive industrial growth and transformation*** aims at studying this relationship in detail. It will try to identify critical factors that help or hinder training programmes to contribute to industrial growth and transformation in different economic sectors and countries, including Bangladesh, Cambodia, Ethiopia, Lao, South Africa, and Vietnam. The research is funded jointly by the Swiss National Science Foundation and Swiss Development Cooperation and runs for three years. It is jointly implemented by a team of researchers from all these countries, coordinated by a team based

at the University of Teacher Education in Zurich (Switzerland). In the case of South Africa our partner is the University of the Witwatersrand.

In order to come to results, we depend on information from companies, training providers and representatives of the public sector. If you were willing to cooperate with the University of the Witwatersrand as part of the research, we would be highly grateful to you.

In return, we hope that you and other partners can make use of our results in a way that skills development can contribute even more to industrial growth and transformation.

Yours sincerely



Prof. Dr. Markus Maurer

Zurich University of Teacher Education

Zurich Universities of Applied Sciences and Arts

Appendix E: Survey Questionnaire

ZURICH UNIVERSITY
OF TEACHER
EDUCATION

Skills for Industry: Company-level survey (phase 1a) v2.0 [ONLINE/TAB-BASED SURVEY]

Final version (31.08.2018)

Consent, privacy statement, data use

This research project aims to identify ways to improve vocational skills development programmes (VSD), which cater to the manufacturing sector. It examines how VSD can most effectively contribute to the successful development of companies. The analysis will be based on data and feedback from companies in six developing countries. In [country], this research project is implemented by [partner] in collaboration with the Zurich University of Teacher Education in Switzerland.

Your responses will be confidential and identifying information such as your company name or email address will be saved separately from your responses. Data will be stored in a protected electronic format. The anonymized data and results of this study will be used for scholarly purposes and may be shared with scholars and stakeholders.

We would be grateful for your support, but participation in this research study is voluntary. If you decide to participate in this survey, you may withdraw at any time. If you have any questions about the research project, please contact [partner].

ELECTRONIC CONSENT*¹: Ticking the "OK" field below indicates that you have read the above information and that you voluntarily agree to participate.

Establishment ID

¹ * required field

Establishment ID* (to be filled out by interviewer):

Establishment ID	
-------------------------	--

A Skill needs

A.1 During the last 5 years, was it difficult to find employees for your establishment² meeting your requirements³?

	No, not at all	Yes, somewhat difficult	Yes, significantly difficult (we could not fill all positions)	Don't know / prefer not to answer
General workers⁴				
Operators⁵				
Supervisors⁶				
Technicians⁷				
Higher management⁸				

² An establishment is a physical location where industrial operations take place. A firm may be comprised of one or more establishments. To qualify for this survey, an establishment must have its own management and control over its workforce.

³ If your establishment was founded after 2012 please provide information on the period spanning from the year of founding and 2017 for all questions.

⁴ General workers typically perform simple and routine physical or manual tasks. This may require the use of hand held tools, such as shovels, or of simple electrical equipment. This involves tasks such as lifting and carrying materials by hand; sorting, storing or assembling goods by hand (sometimes in the context of mechanised operations).

⁵ Operators typically perform tasks such as operating machinery and electronic equipment; maintenance and repair of electrical and mechanical equipment; and manipulation, ordering and storage of information.

⁶ Supervisors typically require an extensive body of factual and procedural knowledge and have oversight of a group of operators and/or general workers.

⁷ Technicians typically perform complex technical and practical tasks which require an extensive body of factual, technical and procedural knowledge in a specialised field.

⁸ The higher management typically consists of a group of high level executives that actively participate in the daily supervision, planning and administrative processes required by an establishment to help meet its objectives.

A.2 Did you tick at least once "yes, somewhat difficult" or "yes, significantly difficult"?

Yes	No

A.3 [Condition: A.2 = yes] You report that some positions were difficult to fill. Did this affect business operations of your establishment in the last 5 years? (Skip the levels, for which it was not difficult to find employees)

	No, not at all	Yes, somewhat negative	Yes, significantly negative	Don't know / prefer not to answer
General workers				
Operators				
Supervisors				
Technicians				
Higher management				

A.4 [Condition: A.2 = yes] You report that some positions were difficult to fill. Did this affect expansion and growth of your establishment in the last 5 years? (Skip the levels, for which it was not difficult to find employees)

	No, not at all	Yes, somewhat negative	Yes, significantly negative	Don't know / prefer not to answer
General workers				
Operators				
Supervisors				

Technicians				
Higher management				

B Training programmes pre-employment

B.[1-5].1 Please indicate the 3 most frequent formal training programmes⁹ from which your [level] have graduated *before* joining your establishment in the last 5 years. Please give the title of the programme and the name of the provider. [One question for each level: general workers, operators, technicians, supervisors, higher management]

VSD programmes (Most, 2nd most, 3rd most important)	
--	--

B.[1-5].2 [Condition: B.[1-5].1 = value] Please assess if the programmes catering to [level] have contributed to meeting your skills needs. (If you have indicated less than 3 programmes, please tick only the relevant options) [One question for each level: general workers, operators, technicians, supervisors, higher management]

	No, not at all	Yes, somewhat	Yes, significantly	Don't know / prefer not to answer
Most important programme				
2 nd Most important programme				
3 rd Most important programme				

⁹ These programmes may cater to lower, medium or higher skilled positions in the respective industry and may be of shorter or longer duration, thus including short-term training as much as industry-oriented higher education programmes. The programmes might have been started with funding from the countries' authorities, development cooperation, the private sector or other sources. All programmes must lead to some kind of certification (excluding informal training and education). Indicate only training programmes, which lead to industry-specific skills.

C Training programmes in-employment

C.[1-5].1 Please indicate the 3 most important formal training programmes¹⁰, which some of your [level] have undergone in the last 5 years after joining your establishment. Please give the title of the programme and the name of the provider. [One question for each level: general workers, operators, technicians, supervisors, higher management]

Programmes (Most, 2nd most, 3rd most important)	
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C.[1-5].2 [Condition: C.[1-5].1 = value] Please assess if the programmes catering to [level] have contributed to meeting your skills needs. (If you have indicated less than 3 programmes, please tick only the relevant options) [One question for each level: general workers, operators, technicians, supervisors, higher management]

	No, not at all	Yes, somewhat	Yes, significantly	Don't know / prefer not to answer
Most important programme				
2nd Most important programme				

¹⁰ These programmes may cater to lower, medium or higher skilled positions in the respective industry. Please indicate only training programmes which are offered by third parties – and not by your own establishment – and have a length of at least five days. Indicate only training programmes, which lead to industry-specific skills.

3 rd Most important programme				
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D Staff

D.1 How many employees were working in your establishment in the years mentioned below?

	2012	2017
General workers		
Operators		
Supervisors		
Technicians		
Higher management		

D.1.2 Did you enter information in all fields?

Yes	No

D.1.3 [Condition: if D.1.2 = no] During the last 5 years, the number of employees has (Skip the levels, for which you provided absolute values before) ...

	declined more than 33%	declined less than 33%	not changed	increased less than 33%	increased more than 33%	Don't know / prefer not to answer
General workers						
Operators						
Supervisors						
Technicians						
Higher management						

D.2.1 How many women were working in your establishment in the years mentioned below?

	2012	2017
General workers		
Operators		
Supervisors		
Technicians		
Higher management		

D.2.2 Did you enter information in all fields?

Yes	No

D.2.3 [Condition: if D.2.2 = no] During the last 5 years, the number of women has (Skip the levels, for which you provided absolute values before.) ...

	declined more than 33%	declined less than 33%	not changed	increased less than 33%	increased more than 33%	Don't know / prefer not to answer
General workers						
Operators						
Supervisors						
Technicians						
Higher management						

D.4.1 Do you provide non-monetary compensation for your employees (Select multiple answers if applicable)?

No	Yes, meals	Yes, accommodation	Yes, healthcare	Yes, other

D.4.2 Please indicate the mean monthly salaries (in [local currency]) of your employees.

	2012	2017
General workers		
Operators		
Supervisors		
Technicians		
Higher management		

D.4.3 Did you enter information in all fields?

Yes	No

D.4.4 [Condition: if D.4.3 = no] You did not provide actual numbers for all employees, please answer the following: During the last 5 years, the mean monthly salary has (Skip the levels, for which you provided absolute values) ...

	declined more than 33%	declined less than 33%	not changed	increased less than 33%	increased more than 33%	Don't know / prefer not to answer
General workers						
Operators						
Supervisors						
Technicians						
Higher management						

E Development of establishment

E.1 In what year was this establishment founded?

Founding date	
---------------	--

E.2.1 During the last 5 years, the products of this establishment have...

become significantly simpler	become somewhat simpler	not changed	become somewhat more advanced	become significantly more advanced	Don't know / prefer not to answer

E.2.2 [Condition: if E.2.1 >= somewhat more advanced] Please indicate the share of the more advanced products in relation to total sales for 2017:

Less than 33%	Between 33% and 66%	More than 66%	Don't know / prefer not to answer

E.2.3 [Condition: if E.2.1 = simpler] Please indicate the share of the simpler products in relation to total sales for 2017:

Less than 33%	Between 33% and 66%	More than 66%	Don't know / prefer not to answer

E.3.1 During the last 5 years, the technology and machinery used for production has...

become significantly simpler	become somewhat simpler	not changed	become somewhat more advanced	become significantly more advanced	Don't know / prefer not to answer

E.3.2 During the last 5 years, has the work organisation and management of production become more advanced?

Yes	No

E.3.3 [Condition: if E.2.1 and/or E.3.1 $\geq$ somewhat more advanced and/or E.3.2 = yes] The introduction of more advanced products and/or the change in production processes required ...

significantly less worker skills	somewhat less worker skills	same worker skills as before	somewhat more advanced worker skills	significantly more advanced worker skills	Don't know / prefer not to answer

E.3.4 [Condition: if E.2.1 and/or E.3.1 $\leq$ somewhat simpler and/or E.3.2 = yes] The introduction of simpler products and/or the change in production processes required ...

significantly less worker skills	somewhat less worker skills	same worker skills as before	somewhat more advanced worker skills	significantly more advanced worker skills	Don't know / prefer not to answer

E.4 Do you export your products, and if so what is the share of your exports?

Do not export	Less than 33%	Between 33% and 66%	More than 66%	Don't know / prefer not to answer

E.5 What share of your establishment is owned by foreign investors (FDI)?

None	Less than 33%	Between 33% and 66%	More than 66%	Don't know / prefer not to answer

E.6.1 Please indicate your establishment's total annual sales for all products (in [local currency]) for 2012.

Total annual sales	
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E.6.2 Please indicate your establishment's total annual sales for all products (in [local currency]) for 2017:

Total annual sales	
--------------------	--

E.6.3 [Condition: if E.6.1 and/or E.6.2 = missing value] During the last 5 years, sales have...

declined more than 33%	declined less than 33%	not changed	increased less than 33 %	Increased more than 33%	Don't know / prefer not to answer

F Thank you

F.1 One final question, would you be willing to participate in a follow-up interview?

No	Maybe	Yes

Thank you very much for providing all this useful information about your company. We will keep you informed about our research project

Appendix F: Interview Questionnaire- HR Director: Interview with representative of senior management / human resources department

COMPANY ID:

Part 1: Hiring and Training

S1 Firstly, we are interested in the different levels of employees working on production in your company. Please briefly describe what defines each level, and which jobs are located at each level.

Possible probes
What is distinct about each level?
What kinds of tasks/jobs are distinctive to each level?
<i>If they don't speak specifically about operators, technicians, supervisors and production management, please ask about that and ask where these are located in terms of levels and ask for a description of these roles.</i>

S2: We have talked briefly about the types of jobs available in your company. Now we are interested in the criteria you use when you are recruiting new employees for the most common jobs. We would like to focus on [MSE] and [HSE]. Can you please explain the criteria you use to hire them and why you think these criteria are important?

Possible probes

Where they mention a qualification as one of the recruitment criteria please ask: What does [X] qualification tell you about a prospective candidate's suitability?

Specifically probe (if it has not been mentioned) whether TVET of prospective employees is a criterion for hiring decisions.

If TVET is a criterion, please ask: Is it the full TVET qualification you are looking for or that candidates have the needed theory?

Why is TVET less/more important for your hiring decisions than, for example, schooling or work experience?

Do you find enough employees, who fulfil your hiring criteria? If not, how is your company addressing this situation?

Do you actively try to hire female candidates [MSE/HSE] and if yes, why are you doing this?

Questions	Strongly agree	Agree	Disagree	Strongly disagree	I don't know
S2.1 It is more important that a prospective employee at the mid-level has a TVET qualification rather than only a school education.					
S2.2 It is more important that a prospective employee at the higher level has a TVET qualification rather than only a school education.					

S2.3 When we hire for the mid-level, we test the skills of prospective employees even if they have undergone TVET.					
S2.4 When we hire for the higher level, we test the skills of prospective employees even if they have undergone TVET.					
S2.5 When we hire for the mid-level, it is more important that the prospective employee has work experience than a TVET qualification.					
S2.6 When we hire for the higher level, it is more important that the prospective employee has work experience than a TVET qualification.					

S3 Now we would like to talk about training for employees that the company directly provides (and that takes place within the company) or supports and finances (and an external provider offers it). Could you tell us about all the different types of training that are available for [MSE] and [HSE] and how you decide on what training to provide?

Possible probes

Based on what respondents say about the type of training they prefer (TVET and/or on the job training) probe this preference and ask: Why is this the case? What about this training do you prefer?

What are the benefits to your company, when using the described training approach?

Do government incentives play a role in your decision making when training your employees [MSE/HSE]?

What factors do you consider when deciding on what training to offer?

Do you actively try to train female employees [MSE/HSE] and if yes, what is the rationale for doing so?

Questions	Yes	No	I don't know
S3.1 We have designated training facilities on the company premises.			

Questions	Number	I don't know
S3.2 How many people spend more than 50% of their time focused on managing training activities?		

Questions	Strongly agree	Agree	Disagree	Strongly disagree	I don't know
S3.3 Training that led our mid-level employees to a recognized TVET qualification is a very important factor when considering promotions.					
S3.4 Training that led our higher level employees to a recognized TVET qualification is a very important factor when considering promotions.					
S3.5 On-the-job training of our mid-level employees is more important than any TVET qualification achieved prior to recruitment.					
S3.6 On-the-job training of our higher level employees is more important than any TVET qualification achieved prior to recruitment.					

S3.7 Providing on-the-job training to our mid-level employees is more useful than providing TVET qualifications to them.					
S3.8 Providing on-the-job training to our higher level employees is more useful than providing TVET qualifications to them.					
S3.9 We don't focus on TVET because we don't find the programmes relevant to our needs					

Part 2: Growth and transformation

S4: We have talked about recruitment and training so far. Now we would like to focus on what has changed in the company in the last 5 years. Please describe the changes you have made to production technology as well as the way your products have changed during this time, and explain why those changes have taken place.

Possible probes

What were the most important internal and external drivers of change (technology and products)?

What made the introduction of these changes easier or more difficult?

Please describe in how far these changes had an impact on your skill needs.

If these changes required more skilled or differently skilled employees ([MSE] and [HSE]): What did your company do? How easy or hard was this to implement?

Did employees ([MSE] and [HSE]) with TVET qualifications adapt faster to the introduced changes (than those without these qualifications) and if yes, why do you think this was the case?

Did employees ([MSE] and [HSE]) with TVET qualifications play a particular role in the introduction of new technology?

Can you name any TVET programme (and related providers), that proved to be especially helpful in this context?

Questions	Strongly agree	Agree	Disagree	Strongly disagree	I don't know
S4.1 Having a high number of mid-level employees with TVET qualifications makes it easier to introduce new products in the company (in comparison to a low number).					
S4.2 Having a high number of higher-level employees with TVET qualifications makes it easier to introduce new products in the company (in comparison to a low number).					
S4.3 Mid-level employees with TVET qualifications adapt faster to new technology (in comparison to those who have no formal skills training).					
S4.4 Higher-level employees with TVET qualifications adapt faster to new technology (in comparison to those who have no formal skills training).					

S5 We have talked about changes in technology. Can you please tell us about any changes in work organization at the level of production in the last 5 years and explain why you made these changes?

Possible probes

Please provide details of the ways in which the work organization changed and the factors that led to these changes.

Were the changes in work organization related to changes in technology/products and if yes, how?

Did having employees ([MSE] and [HSE]) with formal TVET qualifications contribute to your decision to make these changes and has having employees with these qualifications become more important now?

Did these changes have an impact on your skill requirements (at the level of [MSE] and [HSE])? Please explain how.

Did the changes in work organisation affect the role female employees ([MSE] and [HSE]) play in production? If so, why?

Questions	Strongly agree	Agree	Disagree	Strongly disagree	I don't know
S5.1 Mid-level employees with TVET qualifications adapt faster to changes in work organization (in comparison to those who have no formal skills training).					
S5.2 Higher level employees with TVET qualifications adapt faster to changes in work organization (in comparison to those who have no formal skills training).					

S6 We have talked about changes in technology, products, work organisation and have focused on the importance of skills in this regard. Could you please tell us whether – and how – these changes have led to the improved performance of employees and a better working environment at the level of production in the last 5 years?

Possible probes

If not mentioned, then probe whether there have been changes with respect to quality, increased accuracy, reduced time for tasks and increased co-operation.

Probe why these changes have or have not happened linked to:

- Are employees ([MSE] and [HSE]) only performing a specific task at one designated workstation or are they performing different tasks across the production process?
- Are employees ([MSE] and [HSE]) with TVET qualifications able to perform more diverse or complex tasks (compared to those that only have undergone on-the-job, informal training)?
- Do employees ([MSE] and [HSE]) with TVET qualifications perform better and therefore reduce waste, cause fewer defects (compared to those that only have undergone on-the-job, informal training)?
- Are employees ([MSE] and [HSE]) with TVET qualifications able to take on more responsibility and initiative and work better cooperatively (compared to those that only have undergone on-the-job, informal training)?
- Did skills of employees ([MSE] and [HSE]) with TVET qualifications play a special role in enabling productivity:
 - If yes how?
 - If no, why not? (e.g. Didn't the employees have the relevant skills; does the way that work is organised not allow for this; etc.)
- Does TVET help your employees ([MSE] and [HSE]) to develop the right attitude towards work?

Do the above responses (across the probes) differ for male and female employees ([MSE] and [HSE])?

Questions	Strongly agree	Agree	Disagree	Strongly disagree	I don't know
S6.1 Mid-level employees with TVET qualifications need less supervision when working (in comparison to those who have no formal skills training).					
S6.2 Higher-level employees with TVET qualifications need less supervision when working (in comparison to those who have no formal skills training).					
S6.3 Mid-level employees with TVET qualifications cause fewer defects in products and therefore reduce waste (in comparison to those who have no formal skills training).					
S6.4 Higher-level employees with TVET qualifications cause fewer defects in products and therefore reduce waste (in comparison to those who have no formal skills training).					
S6.5 Mid-level employees with TVET qualifications are able to work faster and with greater accuracy (in comparison to those who have no formal skills training).					
S6.6 Higher-level employees with TVET qualifications are able to work faster and with greater accuracy (in comparison to those who have no formal skills training).					
S6.7 Mid-level employees with TVET qualifications are better able to problem solve (in comparison to those who have no formal skills training).					
S6.8 Higher-level employees with TVET qualifications are better able to problem solve (in comparison to those who have no formal skills training).					

S7 We have focussed on how your company has changed. Now, we would like to shift the focus to company growth. Please talk to us about the ways in which your company may or may not have grown, and the factors related to this.

Possible probes

Did internal factors such as workplace relationships (e.g. labour disputes) have an impact on growth and if yes, which ones and how?

Which external factors (e.g. infrastructure or regulations) have made a significant impact on growth?

Did changes in technology and/or work organization have an impact on growth and if yes how?

Did growth go hand in hand with an increase of productivity of the company?

Did the country/sector/industry industrial policy have an impact on growth and if yes how?

What is the relationship between the TVET strategy and the industrial policy?

Does the TVET strategy support the implementation of the industrial policy?

Questions	Strongly agree	Agree	Disagree	Strongly disagree	I don't know
S7.1 Having mid-level employees with TVET qualifications is an important factor for growth of the company.					
S7.2 Having higher level employees with TVET qualifications is an important factor for growth of the company.					

S7.3 The industrial policy of the country has been important in helping our industry grow.					
S7.4 The skills strategy of the country focuses on making sure we have the skills we need in our industry.					
S7.5 As a company we can influence the skills strategy of our industry					
S7.6 Our industry can influence the industrial policy of the country					
S7.7 The skills strategy of the country is aligned with the industrial policy.					

Part 3: Technical and Vocational Training

S8 Finally, we would like to talk more about training programmes that result in a formal qualification. Please tell us which specific programmes are most valuable to you for mid-level and higher level employees. Please tell us what aspects of the programmes are valuable and important. If there are none that are valuable, please explain why TVET qualifications don't work for you.

Possible probes
Do you prefer some providers to others? What are important features of the specific TVET programmes that you find valuable? Was your company involved in any of these programmes in any way (selection, design, assessment)?

TVET/Schooling coverage

What is the share of employees that you have recruited in the last 5 years with the following levels of schooling (highest level applies, following values: don't know / 0% / 25% / 50% / 75% / 100%)¹¹:

	Uncompleted basic education	Completed basic education (year 9)	Completed upper secondary education (year 12)	Completed post-secondary / university education (year 12+)
[MSE]				
[HSE]				

What is the share of employees that you have recruited in the last 5 years who have undergone different forms of industry-specific training or studies (following values: don't know / 0% / 25% / 50% / 75% / 100%)¹²:

	Pre-employment TVET, either a) out of company or b) within company, leading to nationally recognised qualification	Pre-employment vocational training, company based, but not leading to nationally recognised qualification.	In-employment training within the company	In-employment training outside the company	Induction training
[MSE]					
[HSE]					

¹¹ Note: Total on respective row must add up to 100 percent.

¹² Total on respective row must not necessarily add up to 100 percent.

Appendix G: Interview Questionnaire For production management and Trade Union Representative

COMPANY ID:

Part 1: Hiring and Training

P1 Firstly, we are interested in the different levels of employees working in this part of production. Please briefly describe what defines each level, and which jobs are located at each level.

Possible probes

What is distinct about each level?

What kinds of tasks/jobs are distinctive to each level?

If they don't speak specifically about operators, technicians and supervisors, please ask about that and ask where these are located in terms of levels and ask for a description of these roles.

P2 We have talked briefly about the types of jobs available in this part of production. Now we are interested in the criteria the company uses when recruiting new employees. We would like to focus on [MSE] and [HSE]. Can you please explain the criteria which are used and if you think these criteria are important?

Possible probes

Where they mention a qualification as one of the recruitment criteria please ask: What does [X] qualification tell you about a prospective candidate's suitability?

Specifically probe (if it has not been mentioned) whether TVET of prospective employees is a criterion for hiring decisions.

Why is TVET less/more important for hiring decisions than, for example,

schooling or work experience?

Does the company actively try to hire female candidates [MSE/HSE] and if yes, why are they doing this?

Questions	Strongly agree	Agree	Disagree	Strongly disagree	I don't know
P2.1 It is more important that a prospective employee at the mid-level has a TVET qualification rather than only a school education.					
P2.2 It is more important that a prospective employee at the higher level has a TVET qualification rather than only a school education.					
P2.3 When we hire for the mid-level, we test the skills of prospective employees even if they have undergone TVET.					
P2.4 When we hire for the higher level, we test the skills of prospective employees even if they have undergone TVET.					
P2.5 When we hire for the mid-level, it is more important that the prospective employee has work experience than a TVET qualification.					
P2.6 When we hire for the higher level, it is more important that the prospective employee has work experience than a TVET qualification.					

P3 Now we would like to talk about training for employees that the company directly provides (and that takes place within the company) or supports and finances (and an external provider offers it). Could you tell us about all the different types of training that are available to you and other employees ([MSE] and [HSE]) in production and if you have a preference for one kind of training?

Possible probes

Based on what respondents say about the type of training they prefer (TVET and/or on-the-job training) probe this preference and ask: Why this is the case? What about this training do you prefer?

What factors does the company consider when deciding on what training to offer?

Does the company actively try to train female employees [MSE/HSE] and if yes, what is the rationale for doing so?

Questions	Yes	No	I don't know
P3.1 We have designated training facilities on the company premises.			

Questions	Strongly agree	Agree	Disagree	Strongly disagree	I don't know
P3.3 Training that led our mid-level employees to a recognized TVET qualification is a very important factor when considering promotions.					
P3.4 Training that led our higher level employees to a recognized TVET					

qualification is a very important factor when considering promotions.					
P3.5 On-the-job training of our mid-level employees is more important than any TVET qualification achieved prior to recruitment.					
P3.6 On-the-job training of our higher level employees is more important than any TVET qualification achieved prior to recruitment.					
P3.7 Providing on-the-job training to our mid-level employees is more useful than providing TVET qualifications to them.					
P3.8 Providing on-the-job training to our higher level employees is more useful than providing TVET qualifications to them.					
P3.9 We don't focus on TVET because we don't find the programmes relevant to our needs					

Part 2: Growth and Transformation

P4 We have talked about recruitment and training so far. Now we would like to focus on what has changed in the company in the last 5 years. Please describe the changes that have been made to production technology as well as the way the products have changed during this time, and explain why those changes have taken place.

Possible probes

What were the most important internal and external drivers of change (technology and products)?

What made the introduction of these changes easier or more difficult?

Please describe in how far these changes had an impact on your skill needs.

If these changes required more skilled or differently skilled employees ([MSE] and [HSE]): What did the company do? How easy or hard was this to implement?

Did employees ([MSE] and [HSE]) with TVET qualifications adapt faster to the introduced changes (than those without these qualifications) and if yes, why do you think this was the case?

Did employees ([MSE] and [HSE]) with TVET qualifications play a particular role in the introduction of new technology?

Can you name any TVET programme (and related providers), that proved to be especially helpful in this context?

Questions	Strongly agree	Agree	Disagree	Strongly disagree	I don't know
P4.1 Having a high number of mid-level employees with TVET qualifications makes it easier to introduce new products in the					

company (in comparison to a low number).					
P4.2 Having a high number of higher level employees with TVET qualifications makes it easier to introduce new products in the company (in comparison to a low number).					
P4.3 Mid-level employees with TVET qualifications adapt faster to new technology (in comparison to those who have no formal skills training).					
P4.4 Higher level employees with TVET qualifications adapt faster to new technology (in comparison to those who have no formal skills training).					

P5 We have talked about changes in technology. Can you please tell us about any changes in work organization at the level of production in the last 5 years and explain why these changes were made?

Possible probes Please provide details of the ways in which the work organization changed and the factors that led to these changes. Were the changes in work organization related to changes in technology/products and if yes, how? Has having employees ([MSE] and [HSE]) with TVET qualifications become more important now? Did these changes have an impact on the company's skill requirements (at the level of [MSE] and [HSE])? Please explain how.
--

Did the changes in work organisation affect the role female employees ([MSE] and [HSE] play in production? If so, why?

Questions	Strongly agree	Agree	Disagree	Strongly disagree	I don't know
P5.1 Mid-level employees with TVET qualifications adapt faster to changes in work organization (in comparison to those who have no formal skills training).					
P5.2 Higher level employees with TVET qualifications adapt faster to changes in work organization (in comparison to those who have no formal skills training).					

P6 We have talked about changes in technology, products, work organisation and have focused on the importance of skills in this regard. Could you please tell us whether – and how – these changes have led to the improved performance of employees and a better working environment at the level of production in the last 5 years?

Possible probes

If not mentioned, then probe whether there have been changes with respect to quality, increased accuracy, reduced time for tasks and increased co-operation.

Probe why these changes have or have not happened linked to:

- Are employees ([MSE] and [HSE]) only performing a specific task at one designated workstation or are they performing different tasks across the production process?
- Are employees ([MSE] and [HSE]) with TVET qualifications able to perform more diverse or complex tasks (compared to those that only have undergone on-the-job, informal training)?
- Do employees ([MSE] and [HSE]) with TVET qualifications perform better and therefore reduce waste, cause fewer defects (compared to those that only have undergone on-the-job, informal training)?
- Are employees ([MSE] and [HSE]) with TVET qualifications able to take on more responsibility and initiative and work better co-operatively (compared to those that only have undergone on-the-job, informal training)?
- Did skills of employees ([MSE] and [HSE]) with TVET qualifications play a special role in enabling productivity:
 - If yes how?
 - If no, why not? (e.g. Didn't the employees have the relevant skills; does the way that work is organised not allow for this; etc.)
- Does TVET help your employees ([MSE] and [HSE]) to develop the right attitude towards work?

Do the above responses (across the probes) differ for male and female employees ([MSE] and [HSE])?

Questions	Strongly agree	Agree	Disagree	Strongly disagree	I don't know
P6.1 Mid-level employees with TVET qualifications need less supervision when working (in comparison to those who have no formal skills training).					
P6.2 Higher level employees with TVET qualifications need less supervision when					

working (in comparison to those who have no formal skills training).					
P6.3 Mid-level employees with TVET qualifications cause fewer defects in products and therefore reduce waste (in comparison to those who have no formal skills training).					
P6.4 Higher level employees with TVET qualifications cause fewer defects in products and therefore reduce waste (in comparison to those who have no formal skills training).					
P6.5 Mid-level employees with TVET qualifications are able to work faster and with greater accuracy (in comparison to those who have no formal skills training).					
P6.6 Higher level employees with TVET qualifications are able to work faster and with greater accuracy (in comparison to those who have no formal skills training).					
P6.7 Mid-level employees with TVET qualifications are better able to problem solve (in comparison to those who have no formal skills training).					
P6.8 Higher level employees with TVET qualifications are better able to problem solve (in comparison to those who have no formal skills training).					

Part 3: Technical and Vocational Programmes

P8 Finally, we would like to talk more about training programmes that result in a formal qualification. Please tell us which specific programmes are most valuable to you for mid-level and higher level employees. Please tell us what aspects of the programmes are valuable and important. If there are none that are valuable, please explain why TVET qualifications don't work for you.

Possible probes

Do you prefer some providers to others?

What are important features of the specific TVET programmes that you find valuable?

Was your company involved in any of these programmes in any way (selection, design, assessment)?

Appendix H: Permission Confirmation from NAAMSA



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+27 12 807 0671



info@naamsa.co.za



naamsa.co.za

Alenti Office Park | Block F | 457 Witherite Street
THE WILLOWS X82 | PRETORIA

P. O. Box 74166 | LYNNWOOD RIDGE | 0040

PARTNERSHIP | CONSISTENCY | TRUST

#MOBILITYMatters | #naamsaAutolytics | #naamsaDreamsAcademy | SA-AutoWeek

PERMISSION TO CONDUCT Automotive Skills Research Project

Your letter dated 22 October 2018 has reference.

Please be informed that the above-mentioned Authority hereby grants you consent to conduct research on the Automotive Skills Research Project

It would be appreciated if a research report can be made available once the research is finalized.

I wish to take this opportunity of wishing you every success with your Survey.

Kind regards

Dr Norman Lamprecht

Executive Manager

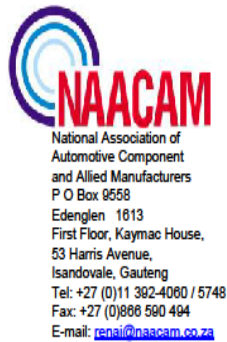
NATIONAL OFFICE BEARERS: President | Andrew KIRBY | Chief Executive Officer | Toyota South Africa Motors
Vice-President: Original Equipment Manufacturers | Neale HILL | Managing Director | Ford Motor Company
Vice-President: Independent Vehicle Importers and Distributors | Gary SCOTT | Chief Executive Officer | Kia Motors
Vice-President: Heavy Commercial Vehicles | Fabio SOUZA | Managing Director | Scania South Africa

EXECUTIVE DIRECTOR: Chief Executive Officer: Mikel MABASA |

REGISTRATION DETAILS: **naamsa** NPC: 2021/358607/08 | PBO No.: 930/023/609 | VAT No.: 4070109972



Appendix I: Permission Confirmation from NAACAM



Dear Mr. T Sibiya

PERMISSION TO CONDUCT Automotive Skills Research Project Survey

Your letter dated 22 October 2018 has reference.

Please be informed that the above-mentioned Authority hereby grants you consent to conduct research on the Automotive Skills Research Project Survey.

It would be appreciated if a research report can be made available once the research is finalized.

I wish to take this opportunity of wishing you every success with your Survey.

Kind regards,



Renai Moothlal
Executive Director of NAACAM

President: Ugo Frigerio
Executive Director: Renai Moothlal

Appendix J: Ethical Clearance



Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Sibya

CLEARANCE CERTIFICATE

PROTOCOL NUMBER: H19/03/30

PROJECT TITLE

Investigating the contributions of vocational skills development programmes to inclusive industrial growth and transformation: A case study of automotive sector

INVESTIGATOR(S)

Mr A Sibya

SCHOOL/DEPARTMENT

Education/

DATE CONSIDERED

15 March 2019

DECISION OF THE COMMITTEE

Approved

EXPIRY DATE

20 May 2022

DATE

21 May 2019

CHAIRPERSON


(Professor J Knight)

cc: Supervisor : Professor S Allais

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University. Unreported changes to the application may invalidate the clearance given by the HREC (Non-Medical)

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to completion of a yearly progress report.**

Signature _____

Date / /

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES



Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Sibya

CLEARANCE CERTIFICATE

PROTOCOL NUMBER: H19/03/30

PROJECT TITLE

Investigating the contributions of vocational skills development programmes to inclusive industrial growth and transformation: A case study of automotive sector

INVESTIGATOR(S)

Mr A Sibya

SCHOOL/DEPARTMENT

Education/

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15 March 2019

DECISION OF THE COMMITTEE

Approved

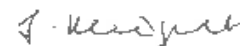
EXPIRY DATE

20 May 2022

DATE

21 May 2019

CHAIRPERSON


(Professor J Knight)

cc: Supervisor : Professor S Allais

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Signature _____

Date / /

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES