

**A research study for Labour and Skills Demand &
Supply in the Formal, SMME, Cooperative and
Informal Sectors of the merSETA Region 1
(which includes Gauteng, Mpumalanga, North West and Limpopo.)**



FINAL DRAFT REPORT

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APPROVALS

Sign-off signifies acceptance of the content. Conditional signature can be made, with space provided to express conditions.

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Executive Summary

This study is intended to support the merSETA in rewriting its Sector Skills Strategy. To do that the research required detailed data on the demand for skills (disaggregated by chamber and province) and an assessment of how training provision is responding to meet that demand. The sector strategy must then develop the most efficient and effective means to bridge the gap between the demand and supply of skills.

Assessing demand for skills is complicated not only by the need for disaggregated data (by chamber and province), but also by the recognition that demand is not straightforwardly a technical measurement. The exigency for skills is mainly determined by business, but it is also influenced by national industrial strategies and provincial plans and swayed by labour's interests. Sometimes these stakeholders in skills are in alignment, but in other instances not. Adding to the complexity is that these stakeholder 'groupings' do not necessarily have homogenous views. Business interests can be fragmented by chamber, geography and size. Labour is also split by chamber and affiliation. Even government's point of view can be different between national and province and across provinces.

In this study, the views on skills demand of these stakeholders in the merSector – arranged around three main groupings: government, employers and labour – are compared and contrasted. The analysis is organised around three hypotheses that frame national industrial policy: first, that localisation and beneficiation will spur growth and have specific requirements for skills; second, that SMMEs will be important employers of skilled workers; and thirdly, that advanced manufacturing should provide spurt to economic prosperity and increase demand for high-end skills.

Based on secondary literature, stakeholder interviews, employer and training provider surveys and a survey with the informal sector we can make the following broad observations:

- Stakeholder groups do not have homogenous views on skills development.
- Larger businesses are more likely to be training employees than SMMEs. The automotive sector, in particular, has well organised training centres.
- There was a view that SETA processes made it extremely difficult for SMMEs to participate in training.
- There was some scepticism expressed over whether localisation was in fact feasible given the realities of global competition. According to this view (coming especially from the motor chamber), skills development that focused on high-end innovation or at a master artisan level was ill-advised when the greatest need was for skills at the lower to mid-range.
- On the other hand, concerns were raised that as automation continued to take over the jobs of low-end blue-collar work, any training at this level would be unsustainable.
- Without mid to highly skilled personnel, adoption of technology would be slow which would negatively impact on productivity, competitiveness and high cost of production over time.
- Moreover, high-end skills (especially of production managers) was seen to be necessary if the promise of an expanded SMME sector was to be realised. People who started up new

enterprises or helped SMMEs to grow their manufacturing output were more likely to be highly-skilled individuals.

- Given this range of views, it is clear that chamber and provincial specific data is needed in order for the merSETA to develop a strategy(ies) that will be able to respond more flexibly to its full range of stakeholders.

In sum, this paper reports on a wide range of views from stakeholders, which, unfortunately, do not make for easy compromises for a singular, definitive merSETA skills strategy. Instead, the merSETA will either have to try balance these views and work out compromises, or develop a strategy that addresses the greatest number of skills demands. If the choice is for the merSETA to focus on one area of skills (whether low-end, artisan or high-end technical skills etc), then the criteria for that decision will have to be spelt out: the first is to align the skills strategy with national industrial policies; the second is to support the industries currently training the greatest number of employees; the third principle is to boost transformation via support to race, gender and disability targets.

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Acronyms

ACRONYM	DEFINITION
AIDC	Automotive Industry Development Centre
BMW	Bavarian Motor Works
CET	Community Education and Training
CSO	Centres for Specialisation
DEDT	Department of Economic Development and Tourism
DHET	Department of Higher Education and Training
DSAP	Dual System Artisan Project
DTI	Department of Trade and Industry
EU	European Union
FAW	First Automobile Group
FET	Further Education and Training
HCV	Heavy Commercial Vehicle
HRDSA	Human Resource Development Strategy for South Africa
GDP	Gross Domestic Product
GM	General Motors
GP	Gauteng Province
IC	integrated circuit
ICT	Information and Communication Technologies
IDZ	Industrial Development Zone
ILO	International Labour Organisation
IMF	International Monetary Fund
IPAP	Industrial Policy Action Plan
Iveco	Industrial Vehicles Corporation
Ktpa	Kilo-Tonnes Per Annum
LCV	Light Commercial Vehicle
LP	Limpopo Province
MAS	Mzabalazo Advisory Services
Maths	Mathematics
MCV	Medium Commercial Vehicle
merSETA	Manufacturing, Engineering and Related Services Sector Education and Training Authority
MCEP	Manufacturing Competitiveness Enhancement Programme
MIDP	Motor Industry Development Programme
MIP	Manufacturing Investment Programme
MG cars	Morris Garages cars
MP	Mpumalanga Province
NAACAM	National Association of Automotive Component and Allied Manufacturers (South Africa)
NAAMSA	National Association of Automobile Manufacturers of South Africa
NAMB	National Artisan Moderating Body
NCAMA	National Certificate Automotive Manufacturing Assembly

ACRONYM	DEFINITION
NRCS	National Regulator for Compulsory Specification
NSA	National Skills Authority
NQF	National Qualifications Framework
NFTN	National Foundry Technology Network
NTI	Intsimbi National Tooling Initiative
NW	North West Province
OCED	Organisation for Economic Co-operation and Development
OEM	Original Equipment Manufacturer
PGDP	Provincial Growth and Development Plan
QCTO	Quality Council for Trades and Occupations
ROI	Returns on Investment
SAIW	Southern African Institute of Welding
SAQA	South African Qualifications Authority
SDA	Skills Development Act
SDLA	Skills Development Levies Act
SETA	Sector Education and Training Authority
SEZ	Special Economic Zone
SMME	Small, Medium and Micro Enterprise
SSP	Sector Skills Plan
Stats SA	Statistics South Africa
STi	Service through Integrity
TASA	Toolmaking Association of South Africa
TVET	Technical and Vocational Education and Training

Chapter 1 : Introduction

1.1 Background

Manufacturing has been through difficult times. Production has fallen since 2001 by as much as 20% (Bhorat, H., & Rooney, 2017) and employment has dropped by a staggering 82,728 (till 2014). Bhorat and Rooney conclude that: “The stagnation of the South African manufacturing sector is primarily as a result of two factors: the emergence of an abundant supply of cheap labour in countries such as China, India, Vietnam and Indonesia and South Africa’s skill shortage, which renders it unable to move up the value chain and produce sophisticated manufactured products” (Bhorat, H., & Rooney, 2017, p. 12) (also see table below).

The aim of this study is to identify, describe and explain those skills shortages in detail across the merSETA chambers (metals, automotive, motor, plastics and new tyre) and disaggregated by province. This report focuses on Region 1 which comprises: Gauteng, Limpopo, North West and Mpumalanga. The Terms of Reference for this research listed three objectives:

- Identify and document the character and scale of labour and skills needs
- Describe the change drivers in the nature of work and of skills
- Evaluate the appropriateness of different education and skills development practices

In discussions with the merSETA, the overall intention of this study was clarified as needing to support the merSETA in revising their skills development strategy. To do so would require more from the study than to gather up what demands industry has in terms of skills. That would be too reactive. Instead, a skills strategy is also meant to be proactive. It has to use skills to support (even direct) employment in ways that meet the national economic development strategy as well as respond to industry’s economic imperatives. A skills strategy can play a brokering role between business interests, labour and government to achieve both economic (business) and political goals.

The opportunity offered by this study, therefore, was not simply to list skills in demand or describe how people are trained (though that is of course at the forefront). Instead, this project also focused on how merSETA’s strategy might bring to the debate of skills development not only questions of which skills are priority skills – but also which skills *ought* to be prioritised.

This is a more normative question. It brings into focus the idea that skills are not simply retrofitted to the needs of business. Government and labour (and other stakeholders such as education and training institutions) are also in dialogue over what kind of skills ought to be developed. While the demand for and training of skills is primarily located in the workplace (which may therefore give industry a greater say in which skills ought to rank first), skills are also subject to political debates over the trajectory of economic development in the country.

This study, therefore, is intended to compare and contrast the opinions on skills demand and supply of three stakeholder groupings: employers, government and labour. Each of these stakeholder groups are assumed to have different motivations when identifying skills needs. Government’s industrial and manufacturing strategies have line of sight to the macro-economic policies and broader political visions. Industry may be motivated (perhaps reductively) by profit. Labour are primarily attentive to ensuring improvement in wages, working conditions, job security and career development.

Even within these groups there may be splinter opinions. Within government, divergent approaches are evident between national and provinces, and between provinces. Industry too cannot be treated as a homogenous group. Big businesses have different appeals for skills from those of medium and small businesses. Labour is also cut across by an assorted list of skills demands – between un-skilled, semi-skilled and skilled workers.

By the conclusion of this study, merSETA's own skills strategy can be located amongst a range of options – and its brokering role becomes more apparent. We attempt to outline what the impacts on strategy might be, based on three possible principles merSETA could follow: the first is to align the skills strategy with national industrial policies; the second is to support the industries currently training the greatest number of employees; the third principle is to boost transformation via support to race, gender and disability targets.

1.2 Methodology

This study intended to scope a wide range of stakeholders – across chambers and across provinces (four in Region 1), as well as both formal and informal businesses. The intention was to gather quantitative data on skills needs. In addition, the study called for an in-depth understanding of the way in which industry was responding in terms of skills development to changes in the work environment, technology and industrial strategies. The scope of the study included the following areas of inquiry:

- The nature and character of economic, labour market and government policy/strategy impacting on the skills needs of the different segments.
- The nature and character of business operations of the different chambers and the impact thereof on skills needs.
- Insight into regional and local government developments and links to skills planning.
- The scale and nature of skills needs in the short to medium term in the merSector.
- In-depth analysis of the unique skills systems that exist within the segments and across the provinces/regions.
- Challenges in relation to the supply of labour and skills.
- Opportunities for effective development of skills.
- Contrasting the training approaches, activities and benefits of training for small and informal businesses with those of larger enterprises with specific attention to different modes of training, and sources of provision (public / private / workplace based, etc.).

To capture both the range and depth of data required, the study drew on both interview and survey methodologies.

1.2.1 Interviews

Interviews were conducted with: industry associations, employers, trade unions, provincial government representatives and training providers. Interview instruments were developed specifically for each stakeholder group, though in general the aim was to conduct in-depth interviews that offered details on how and why skills development had followed particular routes. Fieldwork was conducted in the four provinces of Region 1, as well as with national representatives in industry

associations and trade unions. The Interviewees were sampled – with weightings given to the relative size of the province and the chamber. Summary table of interviews conducted with employers.

Table 1: Interviews conducted

	Auto	Motor	New tyre	Metals	Plastics	Training providers	TU reps	Provincial Govt
National (Industry ass)		3		1	1		3	
GP	2	1	1	6	2	2	1	1
LP	-	9	-	9	2		1	2
MP	-	2	1	4	2	2		
NW	-	5		1	1	2		1

Interviews were transcribed for analysis. Each interview was read and summarised in relation to themes drawn from national policy. These themes were: whether industry was developing skills for localisation and beneficiation; whether SMMEs were providing training and whether skills were being developed in support of advanced manufacturing. (These themes are discussed in detail in the next section).

1.2.2 Employer Survey

In order to elicit information of a more quantitative nature on the kinds of skills in demand, an electronic survey was conducted with employers (and sent out through Survey Monkey). In total, 7728 surveys were sent out to employers with valid email addresses and 509 were returned with responses. Amongst the range of questions asked were:

- What skills are in demand?
- What time is given to training?
- Is training relevant?
- What are the main reasons people drop out of training programmes?

The survey was based on a 5-point Likert scale (with 5 denoting the most positive response and 1 indicating the most negative response). However, a number of open ended questions were included in order to provide further depth and understanding.

Both descriptive and inferential statistical and data driven analysis techniques were used to unpack the findings from the survey. Univariate analysis (e.g. distribution, central tendency and dispersion) was undertaken to summarise and describe the data in a meaningful way. This focused on, for instance, the profile of employers across different segments and regions. This analysis was complemented by inferential statistics (correlation techniques) to draw conclusions on the association between different variables relating to the research questions.

1.2.3 Survey of training providers

An electronic survey was also sent out to training providers (via Survey Monkey). A total of 1403 surveys were sent out and only 55 were returned. Across Region 1 there is at least 1744 registered training providers. Gauteng by far has the highest number of training providers, both in the public and private sector. The number of merSETA accredited training providers is reflective of only the registered addresses of the institutions and not their training sites. In other words, one training provider could have multiple sites of training delivery across different provinces.

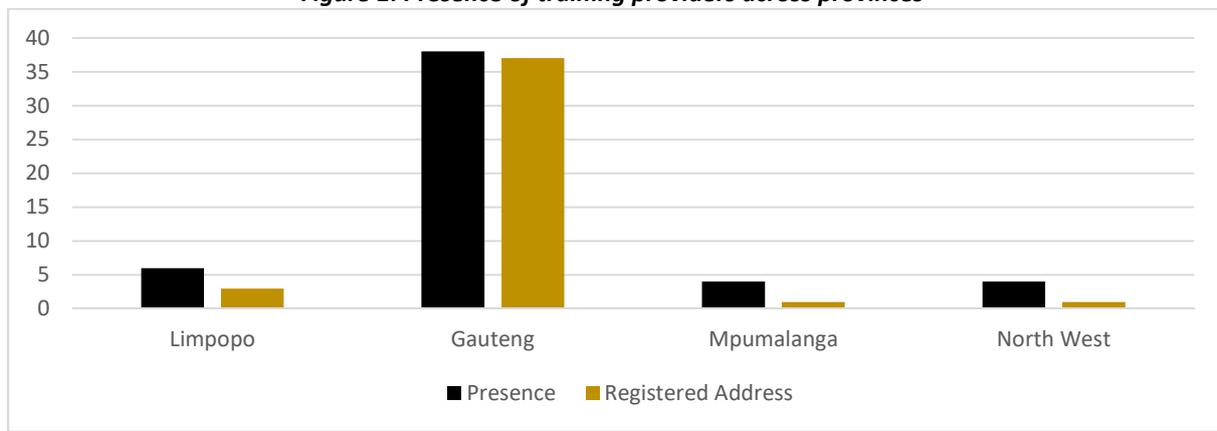
Table 2: Providers of education and training in Region 1 (Gauteng, Limpopo, Mpumalanga and North West)

	Gauteng	Limpopo	Mpumalanga	North West
Public Universities	5	2	1	1
Public TVET Colleges	8	7	3	3
MerSETA accredited training providers	1592	37	69	16
Total	1605	46	73	20

Source: DHET, 2017

In the survey of training providers, although limited in number of respondents, it was reported that the 51 training providers reflected a total of 99 training sites across all provinces. However, in regard to training providers located in Region 1, **Error! Reference source not found.** were the number of registered training providers does not necessarily reflect the number of training sites.

Figure 1: Presence of training providers across provinces



Source: MerSETA survey of employers, 2018

1.3 Field survey

In addition, because there was a specific need to focus on the informal sector, a field survey was conducted amongst ‘backyard’ businesses in contained geographic locations in each of the four provinces. The survey captured information on informal welders, aluminium window makers, motor mechanics, exhaust welders, aircon repairers, tyre fitters and puncture repairers, plastic recyclers, plastic reclamation centres, etc. A total of 271 respondents were covered by the survey across the four provinces with Gauteng having the highest proportion of respondents. A separate report details the findings on the informal sector.

1.4 Focus groups

Focus groups were arranged with MerSETA national office bearers and with regional committees at the end of the project to test the findings of the research. The following focus groups were held:

- Presentation of key insights and informal sector findings: merSETA head-office; 20 April 2018
- Mpumalanga / Limpopo Regional committee, Witbank, 22 May 2018
- Gauteng North Regional Committee, AIDC, Rosslyn, 31 May 2018

1.5 Report Outline

This report is organised as follows:

- Chapter 2 explains the theoretical approach taken in this study. It outlines the implications for skills in manufacturing of government’s National Development Plan, industrial policy and

provincial industrial policies. The themes drawn from these policies provide the organising framework for the analysis of data gathered during this study. It analyses the responses from interviews with industry representative bodies and employers related to the skills implications of policy. A labour perspective is also provided.

- Chapter 3 report on findings on skills scarcity in Region 1 (aggregating data on Gauteng, Limpopo, Mpumalanga and North West). It locates the merSector's economic performance and reports on skills shortages in each of the chambers – and whether demand for training is for skilled artisans and other high-level skills.
- Chapter 4 turns to the supply of skills to the sector as well as the success and challenges employers face with training. The chapter collates information gathered through fieldwork, employer survey, a review of statistical data as well as documentary analysis of industry strategies.
- Chapter 5 summarises the main findings and concludes with strategic options available to the merSETA.

Chapter 2 : Theoretical Overview and Approach to the Study

This chapter provides a framework and explanation for how the findings in this study were analysed. It starts with unpacking government's policies for taking manufacturing forward and assesses what the skills implications of these plans might be. The chapter then tests whether these plans have traction amongst employers and trade unions.

2.1 Government's manufacturing strategy and implications for skills

Several national policies give direction to the manufacturing, engineering and related industries, including: the New Growth Path, the National Development Plan, and the National Industrial Policy Framework and the associated Industrial Policy Action Plan. In concert, their aim is to encourage employment-intensive growth (Bhorat, H., & Rooney, 2017; Williams, Cunningham, & De Beer, 2014). Manufacturing is seen as central to economic growth and IPAP notes in particular the importance of automotive assembly and components; plastics fabrication; and metal fabrication (IPAP, 2007, p4). IPAP records that: "South Africa's key industrialisation challenge is ... to grow and diversify manufacturing exports and tradable services" (2007, p2). Amongst the constraints – that include the exchange rate, monopolistic pricing of key intermediate inputs and an intensely competitive global environment – are challenges with skills development and training.

IPAP's assessment is that: "Skills development and training has emerged as one of the key constraints holding back a number of, if not all, sector development" (2007, p41). It notes "a need for greater and stronger integration between industrial and skills policy and implementation, particularly with respect to sector strategies" (2007, p41).

The NDP describes one of the structural challenges faced by South Africa as a "Middle-income trap" – a difficulty to move out and upwards from a middling economic status – and that one route to escape the trap is to invest "in human capital, product development and technology" (NDP, p112). Government's plans to get out of a possible stagnation in manufacturing include a policy mix of incentives, tax breaks, tariffs etc. Such are intended to:

- encourage localisation and beneficiation;
- reassure SMME's into enterprise ventures and
- push forward with advanced manufacturing.

Each of these three themes has skills implications.

2.1.1 Localisation and beneficiation

The idea behind localisation and beneficiation is to encourage industries to supply parts and inputs to an existing upstream market, while on the downstream to engineer and manufacture products and services from South African raw materials.

The NDP points out: "In general, beneficiation [of mining] is not a panacea because it is also usually capital intensive, contributing little to overall job creation. Substantially more attention will be devoted to stimulating backward linkages or supplier industries (such as capital equipment, chemicals and engineering services). Demand is certain; there is an opportunity for specialised product development, and the product complement is diverse. They are also more labour-absorbing than

typical downstream projects. Such products have the potential for servicing mining projects globally, which is an advantage should the commodity boom persist” (National Planning Commission, n.d., pp. 146–147).

All along the manufacturing value chain, opportunities need to be found for the manufacture of goods that make use of local raw materials and for components to be assembled locally into products. IPAP points to the automotive sector as an example of where: “There is currently insufficient local content particularly at the component end of the value chain” (2007, p7). The goal is to double local input into vehicles from its current 35% of materials to 70% in 2020. (See the supplier efficiency improvement programme). The Automotive Production Development Policy was implemented to help meet those targets and increase the local component manufacturing and the sourcing of goods in the domestic market.

In IPAP 2015/2016, the dti’s key action plan is to develop a plastics production and innovation cluster and promote integration of the plastics products in key sectors e.g. automotives, construction, footwear and medical devices. The intention is to promote localisation through the designation of plastic products e.g. plastic pipes and other construction material under the PICC localisation programme.

The hope is that localisation will have a ripple effect - creating demand for niche products and services that are tailored for the specifics of a South African market. “If I had my Christmas wish,” says a dti official, “I would have taken a more value-chain approach to the manufacturing SETAs. ... we get stuck in certain parts whether it is intermediate goods or finished goods - we get stuck in those sub-sections of the value chain. Unlike the Italians, for instance, who produce a wooden chair from the wood right down to whoever exports that chair from the designers and everybody else involved in there” (dti interview).

To support localisation (in metal fabrication, capital and rail transport equipment cluster), dti partnered with the tooling industry in 2006 to set up the National Tooling Initiative (NTI) programme. Lack of tooling development had been identified as a constraint to the industrialisation process in SA. The main aim of the NTI is to raise the competitiveness of the Toolmaking, Die and Moulding (TDM) sector through critical skills development and job creation programmes, technology development and adoption, enterprise development and export promotion (dti, 2017).

In the NSDS III there is a commitment (in Output 4.5.1.3) that: “Cross-sectoral projects are established to address skills needs along local supply chains aimed at supporting local economic development” (p18). The exact skills needed are left unstated – though the suggestion (from the dti) is that specialisation is key. As a dti official explains: “now we have gotten them [SETAs] into this trap that they must fund everything and not everything makes a difference. So we are churning out welders. But are we churning out under water welders? ... Yet, we have a huge massive coastline and if we can get all the rigs from West Africa you know those oil rigs to come and repair at Saldana Bay we need under water welders. ... We make SETAs like they are schools - it must provide everything. They should be specialists” (dti interview). (Though she does think SETAs can work through TVET colleges to provide specialised skills).

The new initiative of DHET to establish Centres of Specialisation (CoS) at targeted TVET colleges is one where an attempt is made to focus skills supply to specific local or regional needs. An analysis was

made of where the various Strategic Infrastructure Projects (SIPs) will be located and what their priority skills needs will be. A total of 26 CoS across 13 priority trades are now being established to accelerate the skills required by those SIPs. The concern, as with many national plans and projects, remains government’s ability to implement those plans and projects, which if not done, will again only contribute to the disjointedness between skills supply and demand.

2.1.2 SMMEs as drivers of employment and skills

The second theme in South Africa’s industrial strategies is the identification of SMMEs as engines of economic growth and employment. IPAP, for example states that: “Industrialisation requires support for smaller producers and more competitive industries in manufacturing” (dti, 2017, p. 30). The increasing importance of this segment of business activity to government policy is recognised by the establishment of the Ministry of Small Business Development in early 2014. SMMEs encompass a broad range of firms including formally registered, informal and non-VAT registered organisations. Even subsistence and informal enterprises are argued to contribute significantly to GDP (up to 5.2%) (Liebenberg, 2017) and may provide a livelihood and jobs to the unemployed unable to gain access to the formal labour market. Data on the number of SMMEs in the manufacturing sector is shown in the table below:

Table 3: SMMEs in manufacturing

SMMEs	Number (2008Q1)	Number (2015Q2)			Turnover *	GDP (2015Q2)	Turnover * /SMME	
		Total	Formal	Informal	Other	(2015Q1)	* /SMME	
	Total	Total	Formal	Informal	Other	R million	R million	R million
Total	2182823	2251821	667433	1497860	86528	2908020	815636	1.29
Manufacturing	267 817	201 459	62 657	138 801	0	658 740	111 672	3.27

* annualised

Source: (Bureau for Economic Research, 2016, p. 19)

Of the 2.2 million SMMEs in South Africa, just over 200,000 are in the manufacturing sector. There are almost 1.5 million SMMEs classified as informal, but just 9.2% of those are in the manufacturing sector. The number of SMMEs dropped between 2008 and 2015 by almost 70,000 enterprises. Nevertheless, there is scope for expansion, given that the number of SMMEs in South Africa is said to be relatively lower than in other emerging economies (Bureau for Economic Research, 2016).

NSDSIII makes it a responsibility of SETAs to ensure that they identify the skills needs of small and emerging businesses in their sectors. According to NSDSIII: “Skills development is not just about training people for employment; it must also empower people to create opportunities to make a living for themselves. Low levels of education and training, as well as the lack of standardised, appropriate and accredited training, are key constraints to enabling people to create their own opportunities. They are also constraints to up-scaling the contribution of cooperatives, which have historically played and continue to play an important role in providing sustainable livelihoods to the majority of South Africans” (Department of Higher Education and Training, 2011, p. 19).

Not only do SMMEs need training to improve business practices and grow their production outputs, they are also acknowledged to be sites for training. Thus an assumption emanating from national industrial policy is that as SMMEs increase in number, so do the opportunities for skills development.

2.1.3 Advanced manufacturing

The third theme that runs through national economic and industrial policies is to build-up advanced manufacturing capabilities and help “the economy to transition from being a resource-based economy to becoming a knowledge-based economy through technological innovation” (Williams et al., 2014, p. 3).

The dti’s Integrated Manufacturing Strategy (IMS) (dti, 2003), for example, recognised the need to move from raw material-intensive manufactured goods towards increasingly knowledge-intensive goods and services, supported by the provision of the necessary human capital and appropriate technology strategies to improve the manufacturing sector’s competitiveness (DST 2002, p. 5 and DTI 2002, pp. 28, 30). Williams et.al. (2014) note that the IMS recognises that South Africa’s future competitiveness will in part hinge on the ability of the manufacturing sector to innovate and to master advanced manufacturing technology domains.

The Fourth Industrial Revolution is expected to have a seismic change on manufacturing (dti, 2017). Industry 4.0 will speed up production, make it more interconnected, efficient and flexible. More flexible production processes will enable the manufacture of custom-made goods and smart products. ICT skills will become ever more important even for the lowest level worker. As such: “Upskilling is essential to ensure economic survival and social consent; a critical responsibility falls on the state and business for continuous, targeted training and re-training initiatives” (dti, 2017, p. 46).

Advanced manufacturing may also contribute to the green economy. Electric cars, for example, could alleviate our reliance on fossil fuels. Although investment in technology may lead to diversification and expanding production and often requires investment in skills and human capital, it also has a risk of having a somewhat contrary effect on employment. The introduction of automation and robotics has both deskilled labour and replaced unskilled and semi-skilled workers. Chambers in merSector, particularly metals and automotive, are capital intensive and have witnessed massive fall-outs in employment numbers (Hlatshwayo, 2014).

The NDP recognises a trade-off between labour and capital. It says that: “South Africa's manufacturing strength lies in capital intensive industries. In the context of high unemployment, growth would ideally be sourced through expanded contribution of labour. However, to compete, the country's cost structure requires an emphasis on productivity, products and logistics” (National Planning Commission, n.d., p. 148). The NDP points out that as a middle-income country South Africa sits in an awkward space between competing with countries that have low-skilled industries and low-cost structures and advanced manufacturing countries that have high-level skills. South Africa should, therefore, “compete in the mid-skill manufacturing and service areas, and niche markets that do not require large economies of scale” (National Planning Commission, n.d., p. 115).

That seems to suggest that, despite its proposition of futurist, sophisticated technology, in the South African context ‘advanced manufacturing’ is meant to mean ‘up-to-date’ rather than cutting-edge. Technology is still, in the main, imported rather than innovated. Employees may therefore need to be upgraded to the level of skilled artisans who are able to operate and maintain high-end technology. But a balance has to be struck before high-end technology (and the top of a pyramid of high-end skills) displaces too great a number of blue-collar workers.

Williams et.al. (2014) observe that while there is a negative correlation between process innovation and jobs that is more than balanced out by the upswing in direct and indirect employment as a result of product innovation. The high-tech sector can support job creation – but only within very clear conditions. They need to have strong and extensive supply chains (implying a well-established supply base) and forward linkages, and a network of sophisticated service providers which provide the necessary support. Without extensive supply chains and sophisticated service providers, they point out, the indirect jobs multipliers will never be realised. “For example, a high-tech electronics manufacturer that merely imports sub-components and assembles the inputs into products, and is supported by overseas service providers will not create many indirect jobs, even though the firm would be classified as a high-tech company” (Williams et al., 2014).

Moreover, advanced manufacturing can increase the capacity to do jobbing at low cost. Williams et.al. (2014) explain that “Technologies such as AM [additive manufacturing] have the potential to disrupt traditional supply chains through customisable, on-demand and cost-effective single unit production manufacturing in the consumer’s home” (Williams et al., 2014).

The NSDSIII does not provide clear guidance on where the focus ought to be on skills intensity. On the one hand, NSDSIII prescribes an increase in access to occupationally-directed programmes (at intermediate level – especially of artisanal skills), but it also singles out the need for higher professional qualifications as well as the capacity in research, development and innovation capacity (Department of Higher Education and Training, 2011, pp. 14–15).

And while research may provide merSETA with clues and (even) conclusions on how much attention and funding should flow to intermediate versus high-end skills, such research can only tell us about current and medium-term need for skills. Missing from such fieldwork data is what skills ought to be the focus of training based not just on industry needs but also on policy imperatives and a labour perspective.

The aim of this research is therefore to unpack the list of scarce and critical skills that stakeholders furnish in interviews and in survey data and to compare and contrast skills demands by each group’s particular interests.

The three key policy ideas identified here as necessary to boost manufacturing have attendant skills implications. The inference (and even the directive) is that skills training should be targeted at beneficiation and localisation, smaller businesses and advanced manufacturing. While these policy directives have been in place for a number of years and SETAs have had to adjust their own plans accordingly, more research has been necessary to check whether the policy assumptions have adherence in practice – but also how to ensure skills development is supporting national plans. Is it true that SMMEs are hiring and training? (And how might they?) Is there a focus on upskilling employees to higher level skills to out-pace redundancy caused by application of technology? (And how should this be achieved?) And, finally, are government’s economic programmes absorbing employees and providing training? (Again, what are merSETA’s obligations to see this happen?)

2.2 Industry's perspective on skills development

If government's strategies are to boost employment and skills via SMMEs, beneficiation and localisation as well as advanced manufacturing, the test is whether these policies have resonance with current practice in industry and potentially have traction to influence training amongst industry stakeholders. Interviews were conducted with employers on what industry strategies were in relation to growth, employment and skills development and their responses were then compared across chambers and size of businesses.

2.2.1 Localisation and beneficiation

A first consideration is whether industry is capitalising on localisation and beneficiation as an opportunity to nurture businesses, grow employment and improve skills. Where along the value chain are businesses taking up these opportunities? What opportunities are they taking up? There are examples amongst the merSETA chambers of efforts to encourage localisation – particularly in the motor chamber.

The Automotive Supply Chain Competitiveness Initiative (ASCCI), for example, was established in 2013 by the Association of Automobile Manufacturers of South Africa (NAAMSA) with the mandate of coordinating supply chain activities between suppliers, Original Equipment Manufacturers (OEMs), government and labour unions. It's main mandate is to actively develop supply chain competitiveness at a national level within the automotive industry and to increase supplier Manufacturing Value Add (MVA), grow local vehicle production output, increase employment, enable local supply chain capabilities, increase local content and advance transformation. The initiative includes a skills programme to respond to skills needs (Laseinde & Kanakana, 2017, pp. 57–58). Despite the pledge to localisation, however, this was not generally the case. There are a number of constraints to beneficiation and to producing local products for the local market.

For some, the notion of producing locally rather than importing, was simply uneconomical. South African manufacturers could simply not out-price global (and generally this meant Chinese) competition. As an example, during the course of the research for this study, a Tier 1 supplier of leather seats was in the process of closing shop (and retrenching over 550 people) after its main buyer, an OEM, had moved to source seating from Mexico and so cancelled its contract with the South African supplier. In the space of 12 years (since 2006), the four local tanneries supplying five automotive plants had been scaled back to just two tanneries supplying one plant (interview, LC). Notwithstanding being an embodiment of localisation and beneficiation through its upscaling of raw leather, the employment of a high complement of people, its labour intensity and high skills levels, business simply could not vie against the lower labour costs and inflation rate of global competitors (Mexico and in eastern Europe). Adding to the local cost drivers were logistical costs and distance from the customers. Under the MIDP, subsidies helped buffer the car seat manufacturers, but when MIDP was replaced by APDP in 2012, the last few local seat suppliers went down. Lack of skills may have had a part to play in this demise. The employer said that margins of labour efficiency did not increase proportionally with wages. "Labour," notes the interviewee "is not cheap anymore. Labour value has gone up. If 10 people are needed to build a certain product and wages go up by 10%, but efficiency improves by 10%, you break even. But if labour goes up by 10% and efficiency remains the same, the price goes up to charge the customers." Mexico won out because it was on a different gradient on the growth of labour cost vs efficiency.

In the automotive sector, since the OEMs are all overseas companies, production is tailored to an international market and decisions on models, technology, manufacturing processes, employment levels and skills are taken at global headquarters. Lorentzen et.al. (2004) writing in the early 2000s, argue that the South African automotive industry has not kept pace with global competitors because the structure and organisational configuration of the car industry militates against upper-tier manufacturers getting involved in the innovation and design of vehicle and automotive parts. South African auto plants are basically 'assemblers' of vehicles and therefore tied to international platforms. Vehicle manufacturers prefer getting supplies from tried and tested suppliers than to invest in technological capabilities of developing countries. Added to that is the slim supply of engineering graduates – particularly black graduates. They write: "The disjuncture between tertiary education sector output and labour market demand, unless addressed with urgency, comprises the danger of lock-in into activities that are not aligned with the country's traditional competence and that are below its potential" (Barnes & Lorentzen, 2004, p. 480). Whilst the number of Science, Engineering and Technology students in South African universities increased from 273,282 in 2012 to over 294,000 in 2015, the number of engineering graduates increased from 3018 in 2012 to 3804 in 2015¹. This means in an economy with over 1.2 million people employed in the manufacturing sector, there are just about 3000 engineers becoming available annually.

Global competition and economies of scale appear therefore to discount the idea of localisation as a feasible approach (at least in the motor industry). The effort, therefore, to match skills to beneficiation may be mistaken. One interviewee (HJ) mentions that much more effort should be set on filling in the vacuum for lower level skills than to wager on innovations, on developing local products and therefore having to invest in higher-level skills.

Employers mentioned little (if anything) in terms of product development. Metals companies noted that because they were unable to undercut prices of Chinese imports on large-scale orders, in general profits were made from "jobbing" – once-off product manufacturing or small-scale production numbers or maintenance that could not wait for parts to be imported. One of the more successful businesses interviewed for this project was producing once-off, bespoke products such as metal tags for cattle.

It's not just international competition threatening localisation, misguided local policy can also stand in the way. In the following case, the complexities of science may have outsmarted the low-tech options of recycling plastic. Oxo-biodegradable materials have been allowed to be produced locally, but when these are mixed with the recyclable plastics, the quality of the plastic is compromised. You cannot, for example, guarantee the water-proofing quality of plastics when biodegradable materials have been combined into it. Yet, explains one interviewee, "[investors] still go ahead and invest heavily in these companies because the government wants all these foreign companies to set up investments here. Those sorts of things destroy goodwill and destroy relationships ... [they are] not growing the sector because those companies are not using local skills and local materials. They are producing something that is destroying what we would have created. In other words, it will work if it is run properly, but with the way it is currently run it will ruin local businesses" (AH).

The general sense amongst industry is that while there may be lip-service to beneficiation in policy, in practise, global competition and the influence of short-term investment means localisation does not

¹ Higher Education Management Information System (HEMIS), 2017

get much play in practise. But even more critically, is the argument that the higher-level skills in research and innovation that seem to follow on localisation policies is a distraction from the current demands for lower level skills in manufacturing.

These arguments might have been countered had we found better examples of beneficiation and localisation during the fieldwork. Financing skills for innovation and research and development must be done upfront and prior to eventually seeing any return-on-investment. So while there may be no illustrations yet of skills development linked to localisation, these may become evident in a matter of time.

In the meantime, instead of an intentional strategy in localisation, the researchers found that employers were responding to global competition through bespoke manufacturing or 'jobbing' (that is manufacturing small-scale, once-off items). Small production runs, once-off pieces or engineered items that needed quick-turn around provided niche markets secure from the large-scale, but low priced imported products. (A strategy that may impact negatively on long term employment stability if labour is contracted in for short production cycles).

Scaling-up local production and beneficiation, therefore, requires investment in research and development – to innovate niche products and then in the skills to produce those products. In addition, to successfully produce local products and supply materials to upstream industries, would require production specialists – people who have the knowledge to improve the quality and range of products manufactured and the time taken in production.

2.2.2 SMMEs as sites of training

The second theme picked up from government policy is the potential of SMMEs to grow in number and therefore to support an expansion in employment and to be sites of skills training. The first disappointment for national policy is that SMMEs in the manufacturing sector are neither growing in size or number. Findings from SBP's 2015 SME Growth Index (which surveys 500 established firms, employing less than 50 people and operating in three sectors: manufacturing, business services and tourism) revealed that just over one in five firms reported a decline in turnover from the previous year. A further twenty percent reported no growth in turnover in the same period. Only fifty six percent of the panel reported an increase in turnover at an aggregate annual increase of just on eleven percent, marginally better than the nine percent recorded in 2012, but down from an average of thirteen percent in the previous year (sbp, 2015).

The SBP survey showed small firms were creating fewer jobs than in earlier years. The number of firms reporting a decrease in staff has spiked for the first time since the SME Growth's base year, from eighteen percent in the previous year to twenty one percent in 2015 (sbp, 2015). The survey also reported that lack of skills (38%) featured as the second most important factor inhibiting the growth of their firms over the past year. Burdensome regulations in the first place (40%), with local economic conditions at 37% and cost of labour at 32%.

In a study on labour productivity, Rankin (2016) shows that smaller firms have been able to catch-up on the productivity levels of larger firms over the past 20 years. This has been associated with increase in real labour costs for smaller firms relative to larger firms. The downside of this is that there has been an attrition in the number of lower productivity, unskilled-labour intensive smaller firms. In part, this is because small firms are tied into the industrial bargaining structure where wages negotiated by

bigger employers are binding on all firms. If these firms cannot capitalise or substitute with other types of labour then they become unprofitable. Competition from imports adds to the stress. In sum, Rankin concludes that: “observed higher levels of labour productivity are, at least partly, driven by the changing composition of firms and workers – smaller firms employing higher proportions of unskilled workers are exiting. If this is the case then the observed rising labour productivity is not unambiguously positive since it is driven partly by falling opportunities for low-skilled workers. These are the types of jobs that South Africa needs to be creating if it is to absorb the large numbers of unemployed into work (Rankin, 2016, p. 25).

Lack of skills (amongst employees rather than employers), however, did not feature as an important reason amongst our interviewees for the lacklustre growth. For the most part, manufacturers in both the metals and the plastics sectors complained of the competition from imports (mainly Chinese) as a reason for depressed business. Also blamed was the cost of labour and demands made by trade unions. As this email correspondence noted: “We closed our workshop facilities 2 years ago as a result of the economic situation in the country and also as a result of the constant demands made by the Unions which we financially could not cope with any longer. The BBBEE rating demands also affected our decision, as this made it impossible for a small family business to survive and compete with larger companies. The industry lost a very valuable asset due to the closure of our company as we trained quite a few apprentices and equipped them with much higher than normal knowledge. Mastercam and Solidworks programming were part of their day to day training as well.”

For SMMEs then, skills development rarely featured as critically important. In general, the research revealed that the further away one got from corporate employers, the less formal training occurred. In metals and plastics, SMMEs provided very little formal training to workers. Where training was happening, it was informal and as need arose and was focused on currently employed workers rather than inducting new people into the industry (AH). Production processes were modelled to newer workers by older workers or supervisors. In several cases, retired artisans had been recalled back to help mentor younger workers into their positions.

Even in some of the medium-sized metals firms that were visited, training tended to be ad-hoc and informal. In one case, recruits were trained from being cleaners to becoming machine operators through on-the-job mentoring. They might be identified for such promotion simply by demonstrating “correct attitude”, not slacking on simple tasks or generally showing initiative. Machine operators, however, were [regularly] required to update their knowledge of CAD.

The situation is different in the motor chamber where SMMEs dominate the after-market and given the technical skills required in the maintenance of vehicles, training was more widespread. In addition, insurance claims on vehicles are streamed to accredited workshops (which includes certification of technicians) and so training is built into the system. But here again, much of the training was offered through the OEMs which operated large, technologically sophisticated training centres.

BMW’s new training centre, for example, is a technological hub. It’s laboratory style classrooms are equipped with computers and disembodied engines. Training is unique to BMW procedures and technologies. “It is difficult to get someone from outside. We need someone who has been trained at BMW for a couple of months before he can do the work.””.

Nissan is said to be “investing significantly in skills training and development to assist industry initiatives aimed at addressing shortages of skilled engineers and operators” (Metalworking News, Vol 14, 4 September 2017). They have a 2 year graduate programme for engineers to experience on-the-job training. By March 2018, 100 graduates would have gone through the programme. Training for specialised jobs like master welding is carried out at Nissan Japan. Shopfloor supervisors are trained at the Sunderland Plant in the UK – and to date more than 40 local employees have completed the course. Nissan’s Gauteng Automotive Learning Centre – a partnership with the City of Tshwane – offers comprehensive operation training for production line processes and is open to other auto manufacturers and tertiary institutions (Metalworking News, Vol 14, 4 September 2017). Nissan has also opened an Incubation Centre to assist small black-owned businesses.

The Bidvest Automotive Artisan Academy offers merSETA accredited programmes and trade tests in motor and diesel mechanic apprenticeships, auto-electrical apprenticeships as well as learnerships in motor, diesel and autotronics. The perception of training intensity being lower in small firms and highest in large firms is confirmed in the literature. Riberio’s study found that most training was taking place in raw material processing and finished product producing firms, which are typically larger and well capitalized.

The survey findings of Bhorat and Naidoo (2016) shows that that large firms spend more on training than medium firms which spend more in turn than small firms. The section of the survey of interest to us here (that asked on employee-level information and training activities for the year 2013/2014) had a response rate of only 6% (241 employers engaging some 6 422 employees) and so there may be doubt with the confidence in these figures. The Auto chamber spends about 1.5 times the average for the entire sector. Metal firms, however, were spending more per trainee, at about R18 600 per annum (followed by Motor firms, at about R14 300 per trainee and plastics firms at R1 300 per trainee per year on average) (Bhorat & Naidoo, 2016, p. 20).

Training intensity varies by subsector: small firms in the Auto subsector (we take that Bhorat and Naidoo mean the after-market sub-chamber when they use the term ‘auto’) have relatively greater training intensity than medium firms, and large firms in the Motor subsector (by which they mean OEMs) are more training-intensive than firms of other sizes (Bhorat & Naidoo, 2016, p. 14).²

Table 4: Training intensity (% of employees who are trained by size of business in each subsector)

Firm size	Auto	Metal	Motor	New tyre	Plastics	Total
Small firm	80.2	47.4	41.3	38.0	36.0	46.1
Medium-sized firm	65.0	73.4	53.4	–	100.0	66.1
Large firm		45.8	100.0	0.0	94.8	34.6

Source: (Bhorat & Naidoo, 2016, p. 15)

There are a number of explanations for why SMMEs were not training higher numbers of people: First, it might just be the case that objectively skills are not a major problem for growth amongst SMMEs. SMMEs tended to use simpler production techniques and were less likely to invest in advanced machinery and so the skills required were less taxing or production levels were at such low

² We need to read these statistics with some care. Auto firms in the merSETA refer only to the 7 large OEMs – so it is unclear which firm Bhorat and Naidoo reference here as small and medium auto firms.

margins that skilled labour was concentrated in very few hands. The Motor chamber does appear to have more skills requirements. But much of the training here is driven by OEMs who make it a condition of their approved dealerships to do product-specific training a set number of times per year if they are to retain their license. (Issues were raised that SETA funding was not sufficiently covering such top-up training and Continuous Professional Development).

But for independent service stations, no such motivation exists. RMI currently has a 'Right to Repair' campaign which is challenging the hold OEMs have on who has license to service their vehicles that are still under guarantee. Should that condition be lifted, it is anticipated that there will be a wider spread of work amongst service centres and greater demand for mechanics to be up-graded.

Second, SMMEs – especially micro-businesses - could not afford the costs of training. The grants for apprenticeships (R165,000) did not cover the true cost which was more likely to be R400,000 (MD). Neither could SMMEs cover the extended times away from their subsistence operations. This was especially true when training facilities were not accessible in the immediate vicinity. The emphasis on training towards full or part occupational or artisanal qualifications was not suited to artisanal workers in the informal economy. In situ training would be more preferable. But narrow interpretation of the policies and related regulations, exclude informal workplaces that are not fully compliant with the range of criteria suitable for regular formal businesses and work-integrated learning (Liebenberg, 2017)(Hammond, Bowen and Cattell, 2016) .

Third, entrepreneurs: “have very little vested interest in training” (HJ). Profit is their driving motivation and training is an immediate cost – with no guaranteed pay-back or benefit for small businesses. More often than not, SMMEs claim that training will result in workers asking for a raise or leaving for slightly higher paying positions. In the course of our fieldwork, several employers admitted preferring not to have workers go through a formal apprenticeship and trade test because then they were more likely to be poached by competitors. In that context, medium to long-term benefits of training to productivity are undercut. Worse was that safety was compromised (in poorly repaired vehicles, for example), quality of outputs were compromised or even damaged. “Does it make sense [not to train]?” asks HJ. “No. Is it logical? Yes!”

Fourth, the large enterprises have sufficient training budgets and HR departments that can manage formal training programmes. They also have the personnel to deal with the bureaucracy involved with applying for grants from the SETAs. merSETA's procedures and systems for grants disbursements are argued to favour large enterprises. One interviewee called the system “punitive” against small businesses. One interviewee argued that merSETA's messaging at recent road shows was that applications from SMMEs for grants were unlikely to succeed.

Moreover, there was a view that merSETA was doing little, if anything, to support skills development in SMMEs: As one interviewee said: “I don't see a link to small business. merSETA should be running and sponsoring manufacturing incubators for small businesses to be manufacturing little components that we should not be importing from China. They should be facilitating that, this is a big gap” (PC). Another stakeholder (AH) in an industry association explained that merSETA should not just be training on generalised entrepreneurial skills. It was important to identify where the gaps were in the value chains and then deliver tailored training programmes that specifically to that SMME's needs and production processes. Petersen et.al. in a study on the methods of bridging skills demand and supply in South Africa concluded that demand-led skills development requires linkages and coordination

between firms, education and training institutions, which may be quite challenging simply because each of these entities represents a self-interested unit” (Laseinde & Kanakana, 2017, p. 54).

Together these reasons explain why SMMEs had seemingly not made use of training opportunities or taken advantage of available courses developed specifically for them. Nevertheless, several arguments were made of the need to support SMMEs more in training:

- First, since SMMEs are by far the larger employer, an (utilitarian) argument was made by interviewees representing them is that they ought to be receiving the larger share of training grants.
- Second, although many SMMEs claimed skills were not a major constraint on business, this perception was not made in comparison to businesses that had invested in skills development. Bhorat and Naidoo show, “a significant and positive relationship between firm-level training expenditure and a measure of firm-level profitability, as well as the level of the discretionary grant received by the firm” (2016, p. 23).

Yet, SMMEs and micro-businesses might not be aware of the potential productivity gains that might be had from training. One interviewee (IB) noted the costly mistakes made by backyard mechanics. Ansa Liebenberg’s (2017) research of 30 merSector co-operatives in primarily rural communities showed up the sub-standard quality of products and the inability to sustain production.

Finally, given the acceleration in automation by OEMs, it rested on SMMEs to help absorb unemployed workers or offer livelihoods to retrenched workers. The merSETA (and others such as government) should, therefore, develop mechanisms which will allow SMMEs to participate more energetically and in this manner create the opportunity to re-engage unemployed workers in productive employment.

2.2.3 Advanced manufacturing

The third premise of government’s industrial policy discussed here is that the skills strategy ought to help step up advanced manufacturing. The fieldwork tested whether in practise employers were adopting automation and robotics and whether they were adapting skills development accordingly. From the interviews, it appears that mechanisation and robotics is being most quickly taken up in the automotive sector (a result, perhaps, of its rapid integration into the global market) (McGrath & Akoojee, 2007). Technological change has been slower in the metals industry because of the exorbitant cost of replacing plants. Upgrading plastics machinery is also limited by cost given that the chamber is made up predominately of small and micro-businesses.

The general sense is that South African manufacturing is behind on technological advancements compared to advanced countries and that we face a challenge catching up with the Fourth Industrial Revolution (dti interview). The challenge is made even greater because the absorption rate of young people who may be more technologically literate than older workers has been low.

While government’s strategies are designed to encourage business to adopt advanced technologies and at the same time as raise skills and employment, there may be other competing incentives for business to act in contrary ways. It may make financial sense for a business to introduce mechanisation that deskills workers, for example. Andreoli and Neureburg note that: “in the short-term, enhanced firm level competitiveness in many cases requires reduced levels of employment, especially if firms are focusing on process upgrading (e.g. increasing efficiency by introducing new

technology or production systems that require less manual labour for the same level of output” (Andreoni & Neuerburg, 2014, p. 55).

Vass, however, argues that businesses have been more cautious, weighing up the impacts on labour vis a vis mechanisation. She says: “employers would mechanize more if they were not so aware of the potential labour fall-out. Not so much about retrenchment but how the unions will handle this. We could actually have more retrenchments if we did not take worker rights as seriously because it would be such a hassle to go and negotiate all these things”.

On whether or not the merSector should follow an advanced manufacturing and a high skills route, there were differing opinions amongst industry players (the division was mainly cut through by chamber).

On the one hand, there was an argument that the focus should be on the lower to middle skills because that was where most employees were currently located. Bhorat and Naidoo point out that “The merSETA labour market is one that draws in a large number of Grade 12 completers (65% of workers have a Grade 12 completion only), which makes it a semi-skills-intensive labour market” (Bhorat & Naidoo, 2016, p. 23). Yet, it seems that despite their numbers, elementary occupations are overlooked for skills training. Bhorat and Naidoo report that “on average, a greater proportion of managers and professionals are trained compared with plant and machine operators and those in elementary occupations, and this is particularly true in the Auto subsector. Tyre and Plastics, however, train a significantly larger proportion of those in lower skilled occupations compared with higher-skilled occupations” (Bhorat & Naidoo, 2016, p. 14).

In a study comparing skills intensity in the manufacturing sector, Bhorat and Rooney (2017) note that highly skilled jobs have seen the biggest improvement with mid-level skilled employment showing a significant fall. Between 2001 and 2014, the share of skilled workers in the PCR sub-sector grew by 4%, while semi-skilled labour dropped by the same. On the other hand, in the MME sub-sector, skilled workers lost 1% of their labour share, with semi-skilled workers adding 1%. Bhorat and Rooney (2017) do acknowledge that one of the obstacles to pursuing a high skills strategy in South Africa is that the education system is not producing sufficient numbers of skilled individuals and therefore “a growth path based on demand for skilled jobs is unsustainable” (Bhorat, H., & Rooney, 2017, p. 12).

Table 5: Training intensity (% of employees who are trained by occupation within each subsector)

Occupation	Auto	Metal	Motor	New tyre	Plastics	Total
(1) Managers	100.0	36.2	82.1	0.0	41.7	59.5
(2) Professionals	100.0	62.3	88.6	0.0	42.9	58.0
(3) Technicians and associate professionals	60.0	33.7	68.8	0.0	66.7	42.7
(4) Clerical support workers	66.7	71.4	53.4	0.0	80.0	57.5
(5) Service and sales workers	100.0	33.3	57.5	20.0	100.0	55.9
(6) Skilled agriculture, forestry, fishery, craft and related trades workers	100.0	63.6	66.4	0.0	50.0	47.3
(7) Plant and machine operators and assemblers	66.7	44.1	56.8	0.0	94.8	51.7
(8) Elementary occupations	100.0	57.5	19.4	41.7	98.5	49.8

Source: (Bhorat & Naidoo, 2016, p. 15)

Countering the argument for a focus on training up elementary workers to intermediate skills, was a view that it was necessary to increase the pool of middle and high skills employees. Though not dismissing the need for artisans, one industry expert said there had been a fixation on producing artisans to the detriment of skills along the entire value chain. Artisan functions on the factory floor are quickly being taken over by automation and robotics. Their jobs are precarious as a result – and large numbers of artisans are being laid off along with their semi-skilled colleagues. Says on metals interviewee: “They focus a lot on the artisan area (which they should) but they forget that there is a manufacturing mandate” (PC).

The system, it was stated, is producing too many artisans who may have passed the trade test and can therefore take instructions but do not necessarily have the capability to troubleshoot, adapt to changing processes or to new materials, set machines for different product specifications, provide quality oversight and improve productivity. As a result, explains an industry expert: “our standard of manufacturing is pathetically poor” (PC).

What was needed, it was argued, was for artisans to go on to do further training to follow one of two routes – either become production professionals or master artisans. Production professions would be trained on a packaged qualification in lean production and on the principles of world-class manufacturing. They would have technical knowledge, but also management, business acumen and general soft-skills. Not only would these skilled people be needed to lift the quality of products, minimise downtime on production and increase volumes, its these skills that would enable such professionals to start new ventures, to incubate SMMEs and even to become new ‘captains of industry’. Such a qualification for production professionals is not available and it was urgent, therefore, that one be developed.

The second career path would be to upskill artisans into master artisans (high end craftsmen and technicians). Employers (especially in the metals sectors) time and again complained that artisans were not up-to-scratch. One industry expert explains that: “They [artisans] could not even touch the advanced machines. So, we had to get the original equipment manufacturers to send their technicians in [from Germany etc.]. If machines break in the plants things come to a standstill. Millions of Rands are lost” (PC). In many an interview, the demand was for specialised skills – a contention that there were too many welders and not enough coded welders, for example.

Highly skilled artisans are less likely to be displaced by robotics – because, as one interviewee explained, robots do not have the particularly human talent of discretion. “If you are low skilled in any case you don’t have any discretion in your job you don’t have any autonomy about decision-making. As a result, through robotization/digitalization you going to be even more left behind”. High skills are also factored in as a reason behind highly innovative firms. According to Lundall et.al., a “highly competent technical management team” explains why some firms “can operate flexibly and harness skills needed to penetrate niche markets and win export contracts” (Lundall, Maree, & Godfrey, 2008, pp. 6–7).

In sum, the interviews conducted for this research make apparent that industry does not have a unanimous view on the purpose of skills development. Their views are cut through by chamber and by the size of businesses. While there was programmatic support for localisation for bigger businesses, there was also an opinion (especially from SMMEs) that it made little business sense to them. While policy anticipated that SMMEs would be sponges to soak up employment and train

workers, in practise very few appear to do so formally. Its larger companies that are helping to certify employees. Finally, there was no consensus that merSETA should be investing in higher level skills to support advanced manufacturing when the country's manufacturing trajectory was still several steps behind. South Africa, the latter opinion suggested, should be training for current needs rather than hypothesized future ones.

2.3 Labour's perspective on skills development strategy

Labour's views on skills demands was sourced from interviews with trade unions: NUMSA, Solidarity, the Motor Industry Staff Association and the Casual Workers' Advise Office. It also draws on documents and a literature review. Just as with government and business, labour does not have a homogenous or singular view on skills development. Labour's opinions on the purpose of skills development is discussed below along the same three themes used to frame government and businesses assessments.

2.3.1 Localisation and beneficiation

On whether skills development should be focused on improving beneficiation, and training for industries producing for the local market, there was scepticism expressed that the policy would necessarily lead to skills benefits for workers. The CWAO, for example, argues that it was an early Cosatu misapprehension (dating from 1989) that niche markets would create a demand for higher quality goods which would in turn require higher skills and drive up wages. It was, he says, "very naïve". On the contrary, he argues that: "The reality in South Africa is that cheap black labour becomes the competitive advantage". Government policy was on the side of employers and that was evidenced by current limitations being placed on workers' ability to strike. The CWAO interviewee argues that is not accidental. "There are conjunctional questions on how weak the unions have become and how powerful the employers have become".

Solidarity was more inclined to believe there were advantages to be had from localisation, but maintained that government's commitment to beneficiation was little more than lip service. There was no real "public infrastructure development" to support beneficiation. Nor was there political will to regulate imports and prevent the 'dumping' of sub-standard products with which South African manufacturers could not compete. The union rep gives the example of tyres – while South African produced tyres have to comply with the South African Bureau of Standards, imports get away with being lighter, thinner and having shallower threads. The tyre example suggests that a better quality product – made specifically for the South African terrain – does not necessarily lead to higher sales, and therefore to improved employment opportunities. It may not even result in employers investing in skills, if they choose instead to import labour or to mechanise. Says the Solidarity representative: "I am not blaming government entirely – the tyre manufacturers are also to blame. They play both sides of the fence. They bring people over from Indonesia, China, Korea and pay them less than a South African coded welder because their labour is cheaper. It is not a scarce skill issue it is a manipulation issue".

He points to Medupi as another example where skills were imported: "There needs to be an upfront skills, labour and equipment agreement and know what the requirements are that are needed at the beginning of the tender process. Our welders do not work as fast as the Indonesians because they do not have the experience and also do not have the best equipment. When the equipment and the labour is imported there is also no skills transfer".

What the unions point to is that beneficiation does not automatically or directly assist workers with employment and skills. It requires additional lengths – such as willingness on the part of employers or legislative inducements – for skills development to result from localisation. Either way, its developing partnerships across schisms of business and labour that need to be nurtured.

2.3.2 SMMEs as sites of training

A NUMSA interviewee said that the sheer scale of retrenchments – particularly of people with experience – meant that SMMEs were going to be the central to solving unemployment (ML). She says: “they know the operations from A to Z, they know every operation, but the only challenge is that they do not have money to buy the equipment” (ML). Neither do they have business enterprise skills. But according to Numsa, the training provided by merSETA is insufficient. The Retrenchment Assistance Plan (REP) is a 50 credits or six months programme. In agreement with many of the industry interviews, the union representative thought there needed to be much more provided than technical education and that what was really needed was training for SMMEs to understand markets.

The CWAO was however sceptical that growth of SMMEs had any real chance of success given their dismal track record in the country despite government attempts to provide support. There was also some doubt over whether SMMEs were able to train given their very limited budgets for training (MISA). “We do find employees can’t get to training because employers won’t give them the time off and even though the training is at our cost, they are not willing to pay for transport.” Employers were also said to be concerned that once an employee is upskilled, they will leave the company. Bigger companies were more reliable on training – usually product or compliance related training.

There was nevertheless interest amongst (MISA) apprentices to attain small business diplomas. Requests for funding from MISA for this type of training were, however, generally turned down since it was not necessarily motor related or linked to their current trades.

2.3.3 Advanced manufacturing

On government’s policy, high-end technical manufacturing would generate a need for higher skills. The Casual Workers’ Advise Office, however, noted that workers mostly reported that far from learning new skills, the introduction of advanced manufacturing has resulted in ‘deskilling’ – and that jobs on the production line were rarely anything more than repetitive tasks. Even semi-skilled work was hardly taxing on what workers were capable of doing. The CWAO represents workers from a wider spectrum than merSETA – and the experiences of operators in metals and auto may be still be one where skills are needed.

Nevertheless, automation has clearly wiped out large numbers of jobs. Hlatshwayo (2014) argues that trade unions were caught on a backfoot by technological changes. Their focus was on wage negotiations instead, their responses to the introduction of automation at Iscor (where his fieldwork was conducted) was reactive and they were caught almost unawares by the bloodletting in employment that resulted.

There was not a clear line on how to respond to technology and the changing workplace. A Numsa interviewee said that they were now focusing on training at NQF level 4 – and had noted a limited number of options for workers wanting to move up to level 5. Another Numsa shop steward felt that merSETA could do more to research and bring international practices to South Africa.

At the same time, there was recognition that this shift to higher level skills might compromise a focus on ABET and on training unskilled and semi-skilled workers. Also reported was a constant complaint that the SETA paid more attention to new entrants rather than focusing on those already employed. This has created animosity between workers and left older workers feeling exposed to redundancy if they were not prepared for changing technologies or new processes. It was not only general operators feeling their jobs were precarious. Qualified artisans were also finding positions diminishing.

In concert with many spoken to in this study, the Numsa representative worried that training was not clearly linked to a purpose – it did not appear to meet a defined demand. She says: “if you look at the grant applications from employers, it is mostly artisan development but there is no exit strategy - which is my gripe. At what point are we going to stop and ask ourselves, where are the people that we are training, where are they getting absorbed? ... we have to stop at some point and say we have trained enough”. Young people were jumping between learnerships, but not progressing up the NQF level to take advantage of the skills needed by advanced manufacturing. “We train for the sake of training,” she admits: “just pushing numbers and that is the problem”. Her implicit suggestion was that it was not lack of skills that were a problem, but lack of jobs.

In sum, the trade unions interviewed were not in agreement over what the impact of industrialisation policies would be on workers or on how they should respond. An ILO report makes the point that although the unions had made demands over training central to negotiations in bargain councils up until the mid-2000s, thereafter training slipped from their agendas. The danger of union’s weakening voice in the skills sector is that it diminishes labour’s voice over which the scarce skills are and how they might be met.

2.4 Conclusion

Starting with national industrial policy, this chapter identified three main themes that give direction to growing manufacturing in South Africa (and thereby employment and skills). These are: first, that there should be a localisation of production and beneficiation of raw materials; second, policy ought to encourage the growth of SMMEs; and third, concentrating on advanced manufacturing will increase production outputs. Each of these policy thrusts have implications on the kinds of skills likely to be considered ‘scarce’.

If the merSETA’s own skills strategy is to follow on from those themes, then one logical start was to canvass its stakeholders – employers and labour – on whether industrial policies were supported in theory and practice.

One main conclusion arising from interviews with stakeholders and from readings of secondary literature is that there is no clear agreement between stakeholders supporting industrial policy or on what the implications for scarce skills are. Different stakeholders have various opinions and there are even differences amongst stakeholder groups themselves. ‘Scarcity’ is not so much an economic / technical term that can be easily identified. It is also a political term, bound up with policy aspirations. Government’s industrial policy with its themes of beneficiation and localisation, expansion of SMMEs and the promise of advanced manufacturing is forward looking. The implications of those policies for skills development can be at variance with the skills the industry needs more immediately to turn a profit and with the labour movement’s own calculations on how skills might best increase wages or improve working conditions. That’s not to say that all notions on the correctness of industrial policy

or on skills scarcity are equal – some stakeholders may be better at identifying which skills are needed in the short, medium and long term. Moreover, industry may have greater claim on voting on which skills are scarce by virtue of being the paymasters (to the SDL).

Nevertheless, if skills scarcity is understood as a contested term, then the role of merSETA becomes one of mediating different notions of scarcity. The SETA has to try get some agreement amongst the various stakeholders on how the training grants should be divided up. There are possible principles on which to base a skills strategy:

- One principle is to go with skills most likely to boost manufacturing output.
- A second option is to support skills development that trains the greatest number of employees.
- A third principle is to boost transformation via support to race, gender and disability targets.

While it might be possible to get overlap between these principles – that is not necessarily the case. Skills for greatest output may require training skills at the highest levels. That may, in turn, be at variance with the second principle if training at higher levels is concentrated on small numbers of people. Race, gender and disability targets quantifies training at neither utilitarian (the second principle) or market (the first) principles.

In order to find the best basis for its skills strategy, the merSETA has to start with sound, verifiable empirical data from various sources on skills scarcity (even as these are shifting). The merSETA needs to know from its stakeholders what their own attitudes are to industrial policy as well as how employers and labour organisations are responding in terms of skills development. The next four chapters report on findings on skills scarcity and skills development in each of the four provinces of Region 1: Gauteng, Limpopo, Mpumalanga and North West. Each chapter disaggregates the findings by Chamber. The policies of provincial government are detailed and the voices of employers (large, medium and small) are reflected on along with the labour.

The provincial chapters thus provide a report on current practise. The final chapter returns to the policy ideals and to compare these with existing skills development systems. The merSETA's skills strategy must then find its way between policy and practice.

Chapter 3 Skills Demand in Region 1

The previous section reviewed whether policies meant to boost manufacturing production would also help increase employment and skills formation. There were differing sentiments amongst the stakeholders in sector the answer was undecided. For example, although the idea of developing niche local markets was promising for both employment and skills, global competition was also thought to quash any local industrial innovation. Similarly, advanced manufacturing seems like an inevitable trajectory but in the short-term might neglect absorbing semi-skilled labour. Growing SMMEs looks as if it could offer a quick way to expand the potential number of employers, but current evidence shows that if training is taking place in SMMEs, it is informal and ad hoc.

This chapter looks at the other side of the coin of the relationship of skills development to manufacturing growth. Here the focus is on whether current skills gaps, as reported by employers in Region 1, are an impediment to manufacturing growth. After explaining how the data for this chapter was gathered, the chapter begins with assessment of manufacturing growth in Region 1. It then reviews how employers responded to economic growth levels in terms employment practices. The question that follows from there is: whether a change in the workforce profile resulted in skills gaps? Employers were also asked for reasons for why certain skills were scarce. Finally, this chapter reviews skills development initiatives to address skills needs.

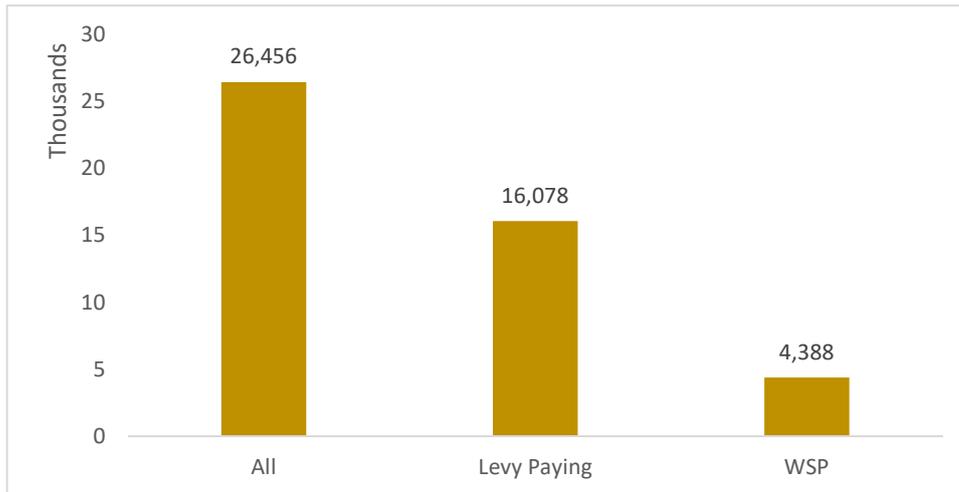
At the conclusion of this chapter, the study is able to say what skills employers reported as scarce and possible reasons for that scarcity. The chapter will also assess whether those skills reported are the same skills required by national industrial policy. In other words, are current skills gaps the same as those that may be holding industry back in the future from going down the route of advanced manufacturing, beneficiation and localisation and SMME growth.

3.1 Employer Outline

Before discussing the demand for skills and labour in the five chambers within Region 1, it is important to first outline the number of employers by chamber, size, and geography, based on data available to merSETA. This is based on data provided to merSETA by SARS based on industry classification selected by companies at time of registration with SARS and those Employers paying levies to merSETA.

The sector has over 26,000 active employers of which over 16,000 (61%) are levy-paying. Figure 2 shows that of these employers, 4388 (17%) submitted workplace skills plans in 2016. Overall it appears, based on WSP submissions, that there has been interaction with at least 17% of employers; considering employers who have participated in funded projects in addition to those that have just submitted WSPs/ATRs.

Figure 2: Employers in the sector



The chamber breakdown in Table 6 below confirms that the Metal chamber has the highest representation with 46% of all active employers followed by Motor (33%). New tyre and Auto appear to be the smallest sub-sectors even though in reality they should be less than they are represented below (which is based on the data provided by SARS). It is anticipated that merSETA will assist with reallocation of incorrectly assigned Employers as the research process unfolds.

Table 6: Employers per chamber

Chamber	All	Levy Paying	WSP
Auto	750	49%	11%
Metal	12171	64%	18%
Motor	8861	56%	16%
New Tyre	172	66%	18%
Plastics	2865	64%	18%
Unknown	1637	62%	8%
Total	26456	61%	17%

With regard to Table 7 below, amongst the active employers in the sector, 91% are small, 6% medium and 3% large. Large employers contribute the highest proportion of levy payers (92%) and those submitting WSPs (81%). For medium sized employers, 94% are levy paying whilst 74% are submitting WSPs. That means these would be the simplest segment of employer to engage with in terms of familiarity with merSETA. Only 11% of small employers are submitting WSPs whilst 57% are paying levies.

Table 7: Employers by size

Size	All	Levy Paying	Submitted WSPs
Small	24101	57%	11%
Medium	1591	94%	74%
Large	764	92%	81%

In terms of geographic representivity as outlined in Table 8, region 1 constitutes 57% of active employers, region 2 represents 22%, whilst region 3 accounts for 21% of the sector.

Table 8: Employers by region

Region	Province	All	Levy Paying	Submitted WSPs
Region 1	Gauteng	11843	63%	19%
	Limpopo	468	57%	16%
	Mpumalanga	1847	57%	9%
	North West	585	57%	23%
Region 2	Northern Cape	399	56%	20%
	Western Cape	4452	63%	17%
	Free State	828	54%	16%
Region 3	Eastern Cape	1382	64%	18%
	KwaZulu-Natal	3973	54%	14%
Unknown		679	67%	0%
Total		26456	61%	17%

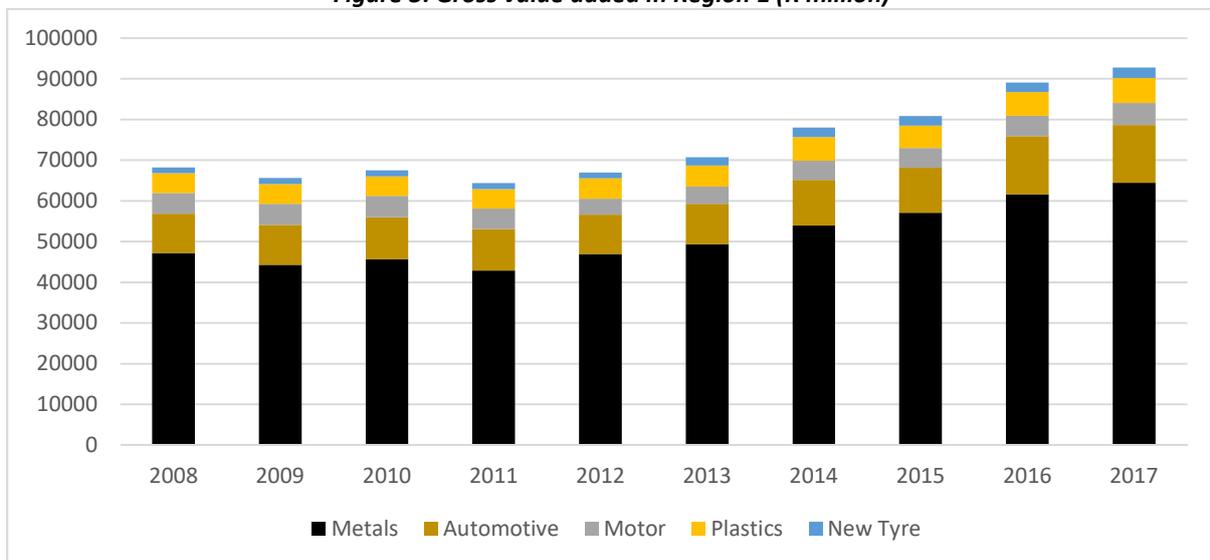
3.2 merSector economy in Region 1

The nature of skills demand in the manufacturing sector can often be told in the visual representation of an economic graph. An economy that is on the up will usually lift the tide of employment and skills. An economy that is depressed will tend to discourage employment and training.

Since 2009, there has been a steady decline in the manufacturing output in South Africa. The year 2018 saw manufacturing decrease by 6.4 percent, the biggest drop since 2015 and reversing from a 4.3 percent gain in 2017. Six of the ten manufacturing divisions shrank, with the largest downward contributions coming from basic iron and steel, non-ferrous metal products, metal products and machinery, petroleum, chemical products, rubber and plastic products (Trading Economics, 2018).

The graph below shows that while manufacturing output has been declining, gross value added for Region 1 across the five chambers has been recovering since the recession of 2008. There was a recorded 35% increase in gross value added (at constant prices) between 2008 and 2017.

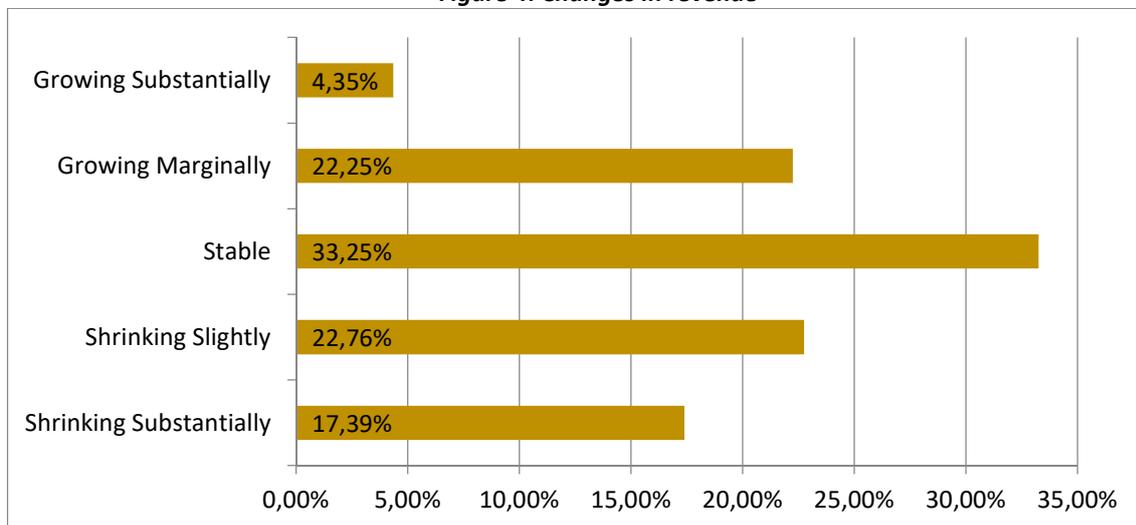
Figure 3: Gross value added in Region 1 (R million)



Source: Quantec, 2018

Although in terms of gross value added there is positive change between 2008 and 2017, in the survey conducted with employers for this study, 40% of businesses reported that they were shrinking in revenue and 26% showed growth. In addition, 33% said their revenues were not increasing.

Figure 4: Changes in revenue



Source: merSETA employer Survey, 2018

Details on the economic conditions affecting metals, automotive & motor and plastics chambers are detailed below.

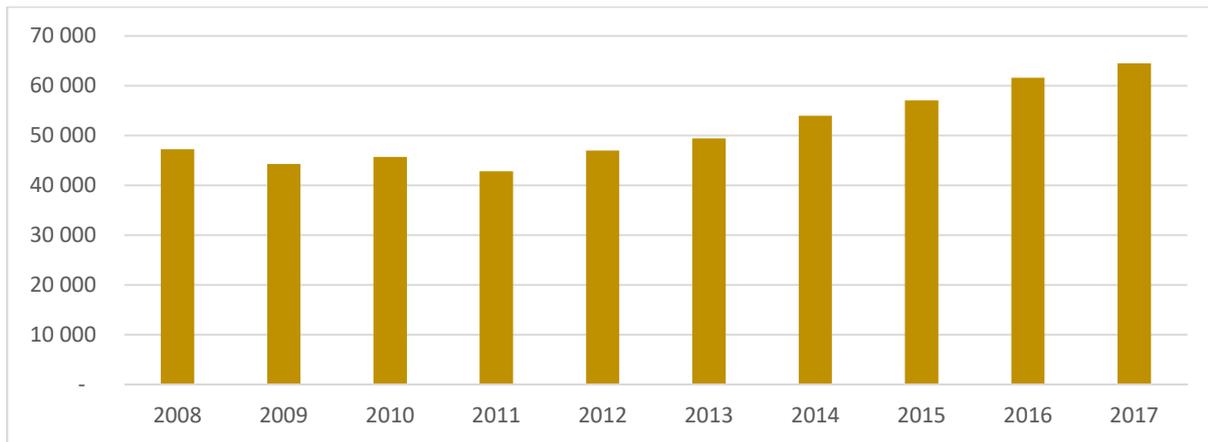
3.2.1 Metals

The Metals industry is made up of foundries, metal fabricators, metal manufacturers and metal recyclers. Foundries and metal fabricators are in the middle of the Metals value chain (see section 8.3) but are key participants of most relevance that we will concern ourselves with. They produce the intermediate (and sometimes final) products that will be received by metal manufacturers who convert them to final products. Key markets for metal products are the auto sector and the construction industry. Metal recyclers complete and restart the metals ‘circular economy’ by returning scrap metal to the beginning of the chain and manufacturing process to be reused in the production of new products. The following are some of the change drivers and opportunities in the industry.

- Automation & Technology – *increasing use of automated machinery and new technology requires an adjustment to the skills make-up*
- Production Innovation – *the impact that product innovation has on required skills in the Sector*
- High Input Costs – *high input costs place smaller employers under pressure and limit their ability to be price competitive*
- Tariffs and Imports – *a lack of protection from cheaper imports in the form of tariffs may require more efficient manufacturing processes and the concomitant skills*

The gross value added for the metals industry fluctuated between 2008 and 2011 and started continued on a consistent growth path from thereon until 2017. Between 2008 and 2017 gross value added for the metals industry in the region increased by 37% from

Figure 5: Metals industry gross value added in Region 1 (R millions)



Source: Quantec, 2018

Across provinces, Gauteng constitutes about 76% of gross value added in the region followed by Mpumalanga with 15%. Although there was a general decline in gross value added in 2011 all provinces appear to have recovered showing increases ranging from 34% (Mpumalanga) to 44% (North West) between 2008 and 2017.

Table 9: Metal industry gross value added per province (R millions)

Metals	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
North West	2478	2462	2537	2582	2657	2744	2827	2865	3254	3559
Gauteng	35846	34007	35029	32697	36316	38260	41816	43918	47011	48874
Mpumalanga	7156	6407	6583	6046	6504	6773	7449	8360	9105	9617
Limpopo	1737	1446	1526	1519	1497	1634	1849	1910	2222	2432
Total	47217	44321	45674	42845	46975	49410	53941	57052	61592	64483

Source: Quantec, 2018

The metals sector experienced some serious challenges which have led to shedding of jobs. Larger employers have tended to automate and increasingly employed the use of technology in their operations. The capital-intensive nature of production has had a negative impact on employment, even though certain occupations have become a necessity. Large companies, such as MacSteel, have closed branches and 2015 saw Highveld Steel in Mpumalanga go into business rescue and retrench 2000 jobs (Faku, 2017). Aveng Trident Steel also gave notice to Numsa for lay-off of 733 staff late in 2017. Furthermore, in 2017, Arcelor Mittal closed unprofitable plants and went into a Section 189 process. Though instead of retrenching people they were moved into other production areas however external recruitment was stopped.

The recent announcement by the United States of America of tariffs on imported steel and aluminium products in 2018 puts in jeopardy 7500 jobs along the value chain (Creamer, 2018). Although South African imports to the US represent a very small portion of their total demand, the amount exported by South Africa represents 5% of production in the country. The increasing input cost of materials (especially after Arcelor Mittal approached the dti for customs protection from imports from Asia), the escalating price of electricity and fuel and external competition (mainly from China) appears to have decimated smaller metals manufacturers. The small machine shops as well as backyard facilities in the Ekurhuleni area are all but disappearing because demand for their products is declining.

The small to medium-sized employers spoken to were mainly involved in 'jobbing' – that is producing individual bespoke items to the mining industry. Their businesses were sensitive to international competition (specifically from China) and lack of investment in the local mining industry. When gold mines in South Africa spiralled downward, many of the metal companies turned for work in mines opening up in Africa mainly in the DRC, Guinea, Sierra Leone, Ghana. One interviewee explained that: "people who don't have exposure to end-users working outside the country are in a precarious situation – they can't really make it. The top-tier mining houses decide on development and we pursue one another's green fields projects. You do work not where people are looking to up production, but to patch something because its leaking or not performing. Those guys on a decent sized mine are committing R1.5 – R3 billion and if you get a fraction of 1% you're doing nicely."

As the industry slips downward, so skilled people take flight and pursue greener pastures, leaving the industry with even less capacity to recover. One interviewee vividly described the situation: "We are just a little boat on a stormy night trying to cross the ice." While political uncertainty and lack of confidence was argued to be dissuading investment, spikes in commodity prices were seen to potentially drum up sufficient demand to open up mines and new shafts. One metals company was optimistic that after eight years of losses, they had started to see a turn around and with contracts signed with Transnet and Eskom, were expecting to buy two extra laser machines that would in turn require additional maintenance and operational personnel.

3.2.2 Automotive & Motor

The Auto Sector consists of one employer segment, Auto Original Equipment Manufacturers (OEMs). Auto OEMs are manufacturers of new vehicles, most of which are passenger vehicles, for the local and export markets. Due to the capital requirements and technical nature of producing vehicles (especially on a mass scale) there are only a handful of Auto OEMs in South Africa, all of which are international brands. South Africa's main sites for automobile production are the Eastern Cape, specifically Port Elizabeth and East London, Gauteng, specifically Rosslyn and Silverton (Pretoria) and KwaZulu-Natal (KZN), specifically Durban. The Auto Sector has some of the largest scales of operation of all the sectors.

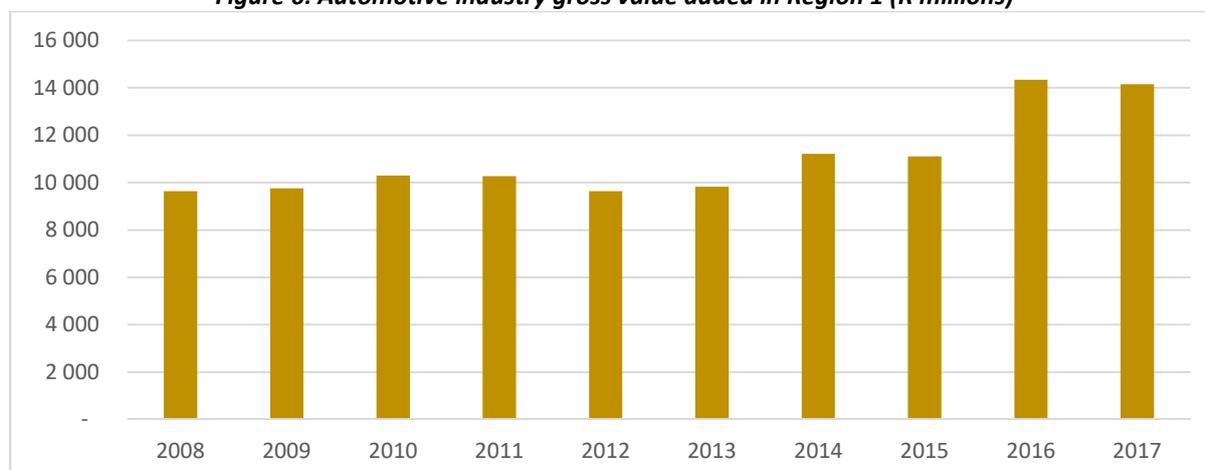
Globally the Auto industry has encountered tremendous changes and challenges. There are value chain linkages between what happens in the Auto industry and what occurs downstream in the motor industry. The following are change drivers observed

- Product Innovation (EVs & hybrids) - *the impact that product innovation (in particular the introduction of electric vehicles and hybrids) has on required skills in the Sector*
- Automation & Technology – *Increasing use of automated machinery and new technology requires an adjustment to the skills make-up*
- Challenges to Market Growth – *requires a different product mix, production and procurement processes- these all work towards a changed skill set*
- Supply Chain Integration – *results in pressure on manufacturers in the supply chain. This added pressure may require a different level of skill from workers*
- Environmental Consideration – *these considerations result in a changed production process and product mix; this results in the need for different skills.*
- E-Commerce in Vehicle Sales
different sales strategies will require different skill sets, for example, IT in E-commerce

Automotive is doing well in comparison to metals. There was a 47% increase in gross value added within the automotive industry in the region. Between 2008 and 2017 the industry undergone a

tumultuous period, with very slow growth in real terms until 2013. The sharp growth of 29% experienced in 2016 was not maintained in 2017.

Figure 6: Automotive industry gross value added in Region 1 (R millions)



Source: Quantec, 2018

Employers in the sector experienced mixed fortunes in the past two years. Roughly a third reported some growth in revenue whilst another third experienced decline in revenue. Almost an equivalent proportion of employers did not see any changes in revenue. Gauteng has the largest concentration of automotive manufacturing in the country. Roughly 40% of national component manufacturing is located in the province. Gauteng accounts for 39% of all vehicles produced in the country, 35.5% of new car sales, 31.2% of light commercial sales, 36% of truck sales and 43.2% of vehicle exports (Crampton, 2017). Within the region however, Gauteng accounts for 89% of gross value added.

Table 10: Automotive industry gross value added per province (R millions)

Automotive	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
North West	512	545	564	586	501	467	502	488	587	563
Gauteng	8499	8572	9059	8983	8504	8722	9943	9806	12685	12544
Mpumalanga	515	526	554	567	525	527	628	659	864	849
Limpopo	117	112	122	129	113	115	145	154	199	197
Total	9642	9755	10300	10265	9643	9832	11218	11107	14334	14153

Source: Quantec, 2018

According to a report published by the AIDC (Economists Urban-Econ Development, 2017), Gauteng’s Automotive GVA CAGR between 2005 and 2015 was 2.5%. This was lower than Mpumalanga (3.8%), the Western Cape (3.7%), Limpopo (3.5%) and KwaZulu Natal (2.9%). According to the AIDC report: “this most likely means that it is producing near capacity as it is the country’s major manufacturer. Regardless of the less substantial growth, Gauteng remains the auto industry capital, in terms of production, gross domestic product (GDP), sales, as well as job provision” (Economists Urban-Econ Development, 2017, p. 49).

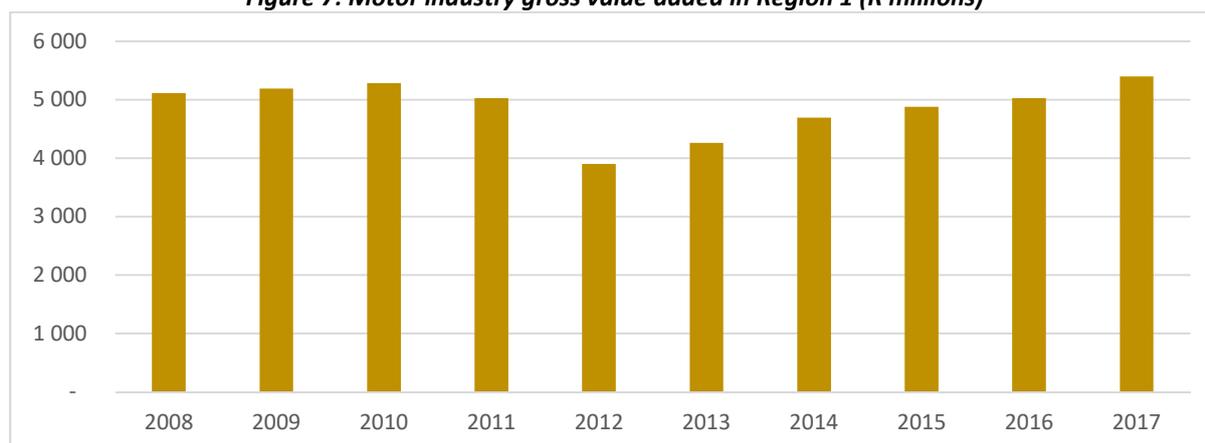
Although Nissan have over the years downscaled and no longer manufacture cars (they now assemble only bakkies), production of the Nissan Navara for local and export market is expected to boost

business substantially. Indeed, they reported complaints from staff that they are working too much overtime.

Nevertheless, there were companies feeding into the automotive assembling process that were less buoyant than the OEMs. Increasing cost of labour in proportion to productivity was raised as an important factor in the closure of a Gauteng factory producing leather car seats in 2018. Almost 550 staff were retrenched after a major car manufacturer awarded its contract for seats to a supplier in Mexico on the basis of price. The major cost drivers had been the logistical distance from customers in Europe and inflationary pressures on the cost of labour. As the production manager put it: “labour is not cheap anymore.”. Until 2012, the MIDP had offered a cushion – in terms of subsidising logistical / transport costs – but when that fell away, the competitive pressures have pushed the remaining seat manufacturers towards closure. The impact has been felt by the tanneries too - in a space of 12 years, four tanneries supplying five plants were felled down to two tanneries supplying just one plant.

In the motor industry, which has value chain linkages with the automotive industry, there was a 6% increase in gross value added between 2008 and 2017. The gross value added remained fairly constant with some slow growth, dipping by 22% in 2012 before recovering and showing a steady growth up to 2017.

Figure 7: Motor industry gross value added in Region 1 (R millions)



Source: Quantec, 2018

All provinces within the region seemed to follow a similar growth trajectory in gross value added. Although Gauteng represents 93% of gross value added in the region, the all provinces appear to have been affected by the 2012 decline.

Table 11: Motor industry gross value added per province (R millions)

Motor	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
North West	127	128	129	125	85	86	91	95	93	97
Gauteng	4719	4795	4882	4641	3626	3974	4373	4532	4682	5035
Mpumalanga	251	251	255	243	181	191	215	234	238	250
Limpopo	19	18	19	18	12	13	16	18	18	19
Total	5116	5192	5284	5027	3905	4264	4695	4879	5031	5401

Source: Quantec, 2018

In motor, **Jamine (2017)**, is quoted as saying that although the decline in new vehicle sales in recent years affected retail sellers negatively, it would provide a boost for the after-sales market as buyers would keep their vehicles for longer. This means additional maintenance and servicing of vehicles that are already owned by consumers. At the same time, Niemand (2017) points out that service intervals for new models had become much longer impacting on the level of business to be had from workshops.

3.2.3 Plastics

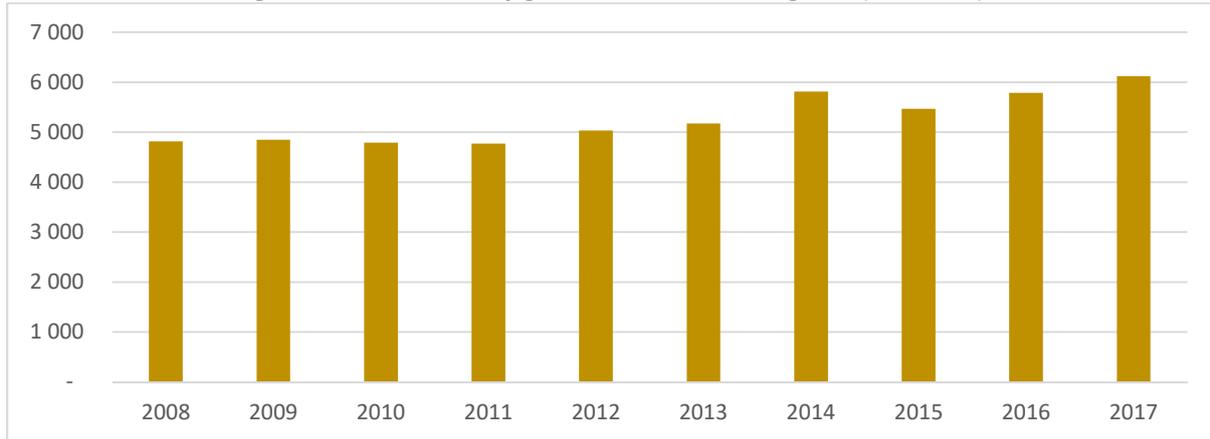
Within the plastics value chain, the two key Sub-Sectors that fall within the focus areas of merSETA include manufacturers, both small and large, and recyclers who comprise the plastics pickers or collectors and recycling companies. In recycling (particularly plastics pickers), the Plastics Sector has some of the smallest and most vulnerable businesses consulted. This is in stark contrast to the larger plastics manufacturers. The following change drivers have been identified in the plastics industry.

- Automation in the Plastics Sector
increasing use of automated machinery and new technology requires an adjustment to the skills make-up – not as prevalent in the Plastics Sector
- Innovation in the Plastics Sector vs. “the poor cousin”
there is a need to provide sector and sub-sector specific skills interventions
- Mobility of Shop Floor Workers
lack of skills prevent some employees from moving up the career ladder
- Monopolisation of the Polymer Market
lack of skills acts as a barrier to entry and prevents new entrants to the market
- Competition from lower-cost Chinese products
a lack of protection from cheaper imports in the form of tariffs may require more efficient manufacturing processes and the concomitant skills
- Recycling of plastics and environmentally friendly focus
new environmentally-friendly products and manufacturing processes will require different skills but also present potential for new Smaller Employers in the Recycling Sub-sector

In 2015, Plastics SA published figures indicating that plastic consumption within South Africa had grown year-on-year by nearly 9%. In the past year, an estimated 1.4 million tonnes of virgin plastic had entered the South African market. The largest part of this plastic, about 53%, is used in the production of packaging, with 11% being used in construction, 7% in the Automotive industry, 7% for electrical/electronic appliances, 5% for sports and leisure products, 5% for medical products and 12% for other products (textile, agricultural industries etc.) (Creamer Media's Engineering News, Local plastics sector shows solid growth performance, 2016).

The plastics sector has experienced consistent negative growth in real gross value added between 2008 and 2011. In 2006, the sector contributed 0.7% to the country's total output and this reduced to 0.4% in 2016. According to CCRED, performance of the plastics sector has been poor and sector output has declined from 2007. “In actual fact, plastic products would be expected to grow more rapidly than GDP and more than upstream sectors in a diversified industrialising economy. Three industries in particular – construction, packaging, and automotive – drive growth of the plastics sector as economies grow, but in South Africa's case, though the industries have been growing, this has not translated into growth for the plastics sector” (Centre for Competition Regulation and Economic Development, 2016, p. 7).

Figure 8: Plastics industry gross value added in Region 1 (R millions)



Source: Quantec, 2018

The South African Plastic sector is a well-developed market, catering to both local demand and export markets. The Plastic market is currently growing at around 2% per year (Plastics SA, 2014). Within the region, the sector is concentrated in Gauteng. Across the provinces there was a consistent growth trajectory between 2008 and 2017. In this industry, 41% of employer survey respondents did not experience any changes in revenue whilst 36% experienced a decline.

Table 12: Plastics industry gross value added per province (R millions)

Plastics	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
North West	133	145	143	153	152	148	162	155	160	168
Gauteng	4491	4513	4462	4430	4684	4829	5414	5078	5375	5686
Mpumalanga	158	160	157	160	167	169	198	198	211	224
Limpopo	33	31	32	32	32	32	40	40	41	43
Total	4815	4849	4794	4775	5035	5178	5813	5470	5788	6121

Source: Quantec, 2018

Though plastic consumption has increased on a yearly basis, some of the stakeholders within the Plastic sector have experienced a significant decline in demand due to increased imports of plastics and changes in the market. Rising costs of polymers used to manufacture plastic products has led to increased competition from advanced developing countries exporting cheap and relatively low added-value plastic products to South Africa. This has had a profound impact on domestic demand, causing some parts of the world's Plastics sector to restructure. As a result of this, many South African plastic companies have started to relocate themselves to these low-cost production countries, effectively becoming importers to South Africa themselves.

The recycling of plastic materials has increased by 12,8% from 2013 following the implementation of Plastics SA's "Zero Plastics to Landfill by 2030" vision. In the 2014/2015 financial year, roughly 20% of all the plastic manufactured in 2014 was recycled, leading to an estimated 265,000 tons of recycled plastic re-entering the market (Creamer Media's Engineering News, Local plastics sector shows solid growth performance, 2016).

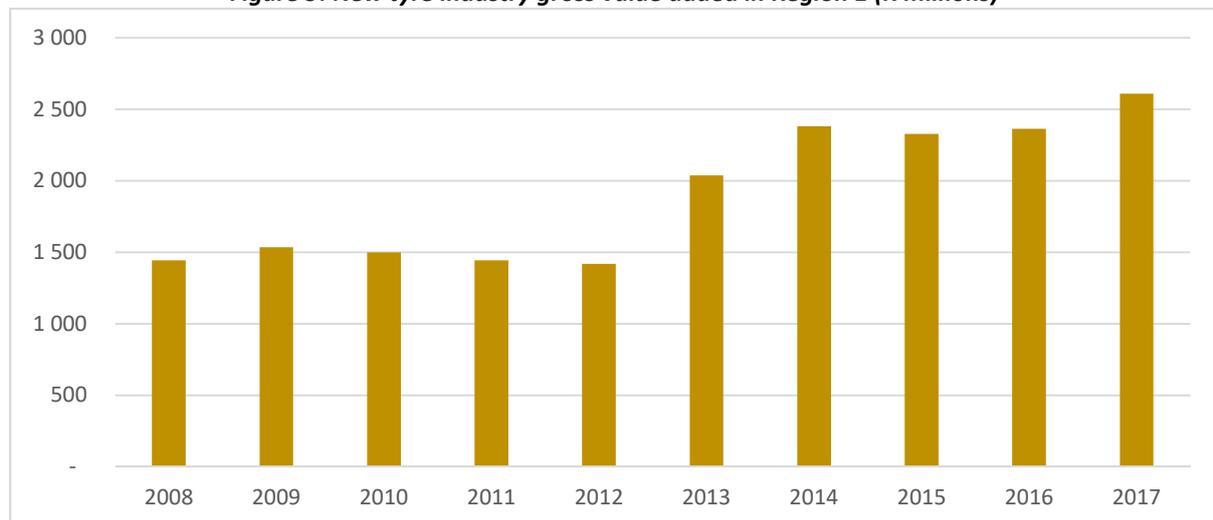
3.2.4 New tyre

The New Tyre industry is the smallest chamber in the merSector responsible for the production of new tyres. As such, the only key employer segment is new tyre manufacturers. With just four locally based manufacturers, there are even fewer new tyre manufacturers based in South Africa than Auto OEMs. Good Year, Bridgestone, Continental Tyres and Sumitomo Rubber are international heavyweights with production facilities in South Africa. The following are some of the change drivers and opportunities in the industry:

- Product Innovation
the impact that product innovation has on required skills in the Sector
- Automation & Technology
increasing use of automated machinery and new technology requires an adjustment to the skills make-up
- Challenges to Market Growth
requires a different product mix, production and procurement processes - these all work towards a changed skill set
- Quality of Training and Graduates
the extent to which training institutions equip graduates with relevant skills
- Alternative Production Location
South Africa may be an attractive production location; with this will come a higher demand for skilled employees
- Environmental Considerations – *new environmentally products and manufacturing processes will require different skills*

The gross value added for the industry remained fairly stagnant in real terms between 2008 and 2012 before showing some growth from 2013. There was a 81% increase in gross value added in the region between 2008 and 2017.

Figure 9: New tyre industry gross value added in Region 1 (R millions)



Source: Quantec, 2018

Within the region, the new tyre industry has a high gross value added in Gauteng (80%) followed by Mpumalanga. Whilst Gauteng gross value added increased by 80%, North West increased by 56%. Mpumalanga and Limpopo experienced more than 100% increase.

Table 13: New tyre industry gross value added per province (R millions)

New Tyre	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
North West	106	121	116	117	108	146	162	157	153	165
Gauteng	1165	1232	1203	1149	1140	1646	1920	1862	1895	2094
Mpumalanga	147	158	154	151	146	208	253	261	267	296
Limpopo	25	26	26	26	25	36	46	48	48	53
Total	1444	1536	1499	1444	1419	2037	2381	2328	2363	2608

Source: Quantec, 2018

About two-thirds of employer respondents in this industry have indicated that their revenue have been shrinking. None of the employers indicated any increase in revenue. This could be attributed to the cheap imports that have flooded the market. With the reduction in revenue, half of the employers indicated reducing their full-time staff headcount by at least 10%. A third of the employers have increased the number of part time employees.

3.3 Employment and skills demand

The study findings indicate that in the chambers under economic pressure – metals, plastics and new tyre – employers seem to be letting go of semi-skilled labour and staying with higher proportions of low-skilled workers (especially amongst SMEMEs). On the other hand, automotive and motor have been weathering the economic climate better and together with adoption of new technology, employment trends are for higher skilled people.

In the economic context sketched above, 26% of employers stated they were growing in revenue but as many as 40% claimed to be shrinking in revenue. In attempting to improve productivity, firms can try change the composition of their workforce – either hiring higher skilled individuals or employing lower-skilled individuals (and so saving on the wage bill).

This section reports on how employers in the region have adjusted their workforce over recent times and then lists the skills stated as being scarce. The first point to note is that, overall, it's clear that employment has come down in the metals sector and has not grown significantly in other industries between 2010 and 2015.

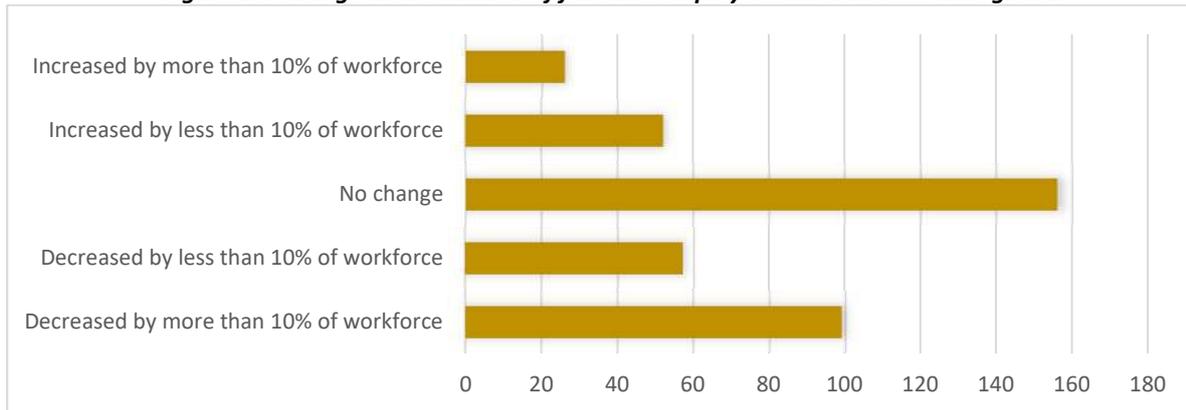
Table 14: Numbers of employees in the formal and informal sectors, 2007-2015, REGION 1

Chambers	Skills levels	2010	2011	2012	2013	2014	2015
Plastics	Formal: Total	32577	31957	31765	31606	39215	38352
	Informal	522	531	451	520	612	647
Metals	Formal: Total	500293	516133	520859	523917	512285	506821
	Informal	67681	69319	59937	69899	65442	68293
Motor	Formal: Total	41633	41431	41731	41327	37445	43729
	Informal	0	0	0	0	0	286
New-Tyre	Formal: Total	6056	6383	6466	6177	6882	6791
	Informal	0	0	0	0	0	0

Source: Quantec, 2017

The survey of employers showed that 20% of respondents had increased the size of their workforce, whilst 40% reported no change and another 40% said employment numbers had decreased. Across all chambers in the sector there are examples of businesses that have either shut down their businesses completely or downscaled the number of people employed.

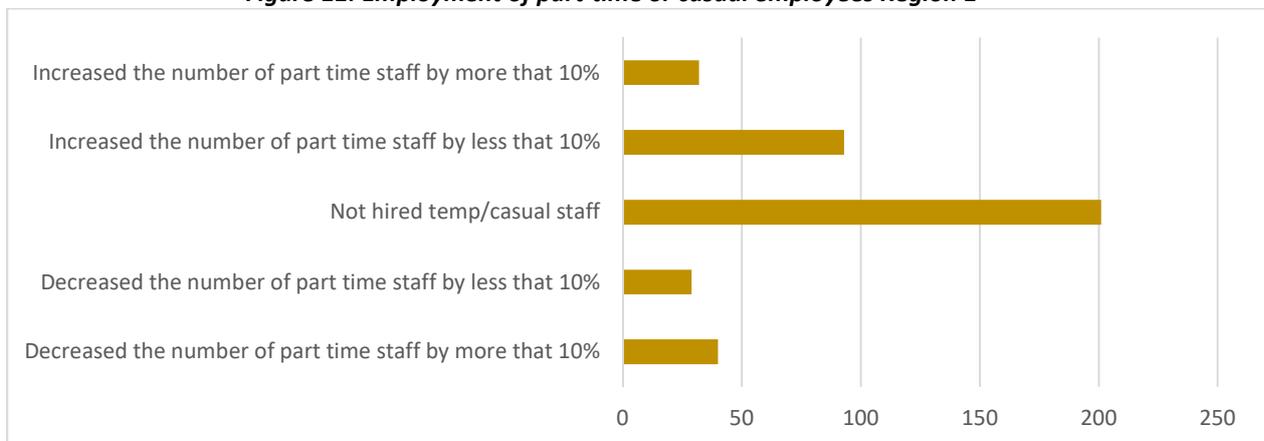
Figure 10: Change in the number of full-time employees in businesses in Region 1



Source: merSETA employer survey, 2018

Interestingly, 31% of employers reported increasing the number of part-time employees. This has important implications for skills development. Employers are less likely to want to invest in skills for casual labour or may only concentrate on elemental training (for the immediate job at hand) which does not contribute to holistic development of people. The flipside, if casual or part-time labour have periods of down-time (waiting to be re-employed for the next contract), then there is a possibility to engage them in extensive skills development (full learnerships, artisan training, etc). However, technically as “unemployed” workers, such learning processes would be coupled with a stipend which has a very direct impact on SETA discretionary funds and budgets.

Figure 11: Employment of part-time or casual employees Region 1



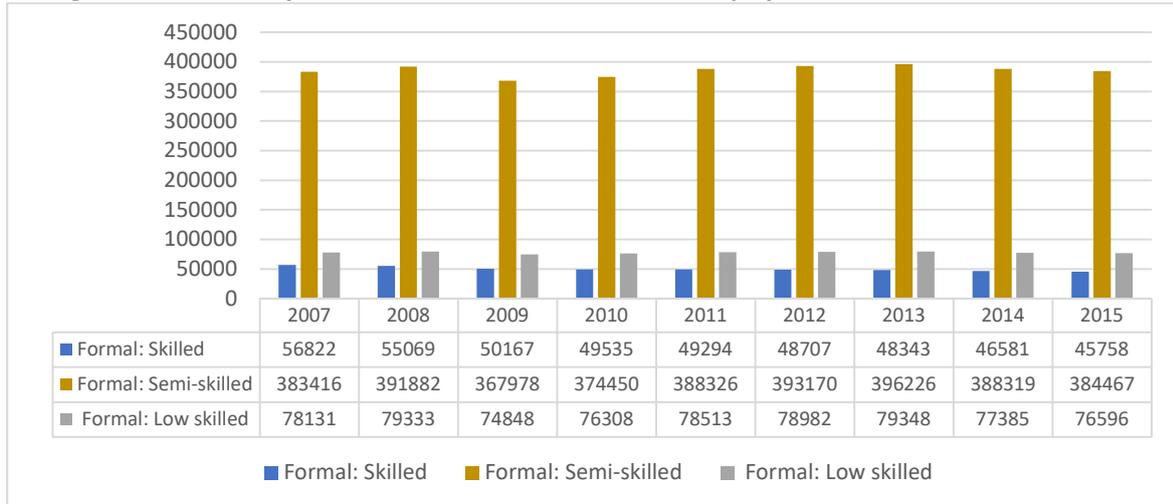
Source: merSETA employer survey, 2018

More detail on shifting employment patterns in each chamber is described below.

3.3.1 The metals sector

Figure 12 below shows decreasing numbers in employment in the region and it appears that skilled work has been hardest hit. Employment in the formal sector has dropped. Amongst skilled workers total employment declined from 56822 in 2010 to 45758 in 2015. Both semi-skilled work and low skilled increased slightly during the period. Employment in the informal sector has remained more steady.

Figure 12: Numbers of skilled, semi-skilled and low-skilled employees in the metals sector, 2007-2015



Source: Quantec, 2017

The metals sector provided the clearest evidence of companies downsizing their workforce and relying on lower-skilled workers. One employer in Gauteng said they simply could not afford skilled labour at this point and their unskilled workers were all multi-tasking. The small employers were often able to do this since they were producing products that were simple fold-and-weld. Even the medium-sized companies appeared to employ proportionately more lower skilled labour. A Gauteng stainless steel factory, for example, said that in fabrication (where they contracted in employees on a needs basis), 40% will be qualified artisans. In the day-to-day operational side of cutting steel, however, the company employed only two skilled artisans to oversee 70 shop-floor operators.

One of the consequences of employing unskilled people was that quality of workmanship was a problem. “We have major problems with scrapped work,” said one interviewee. Inadequate literacy and numeracy skills were mentioned as a problem that could have expensive consequences. As an example, numbers scored into the metal the wrong way round were difficult to correct (MS). The shift to a lower-skilled workforce was only partly because of costs. Other reasons included not finding suitably qualified individuals. In the survey of employers for the metals industry, the following skills rose to the top as most in demand:

Table 15: Metals skills demand

Occupation	Frequency
Welder	56
Boilermaker	48
Fitter and Turner	44
Production / Operations Manager (Manufacturing)	32
Quality Manager	26
Millwright	22
Metal Fabricator	18
Metal Machinist	18
Sheet Metal Worker	17
Electrician	15

Despite owning a metals company that assembled large-scale equipment for mines (such as conveyor-systems), an interviewee said he knew just one **welder** in the past 15 years who had a trade qualification (his employees were coded welders or had learnt the skills on-the-job but had no certification).

Employers spoke of inherently dangerous and tough working conditions for welders and boilermakers which deterred young people from entering the trade. “**Boilermakers**,” explained one interviewee, “live in an environment where they are either too hot or too cold. They are on their feet all day. They work a standard 40 hour week. I don’t remember the last time I’ve seen a decent boilermaker under the age of 45. They just don’t exist. I think a lot of people when they see the business, think they can do a lot better behind a desk”. Another employer also noted a scarcity in boilermakers: “My youngest boilermaker is 58 and the oldest is 73. There are no young boilermakers coming through. I’ve just brought back one of my welders – he’s 64 – to train the young guys.”

A niche, scarce skill mentioned by only one workplace (a large employer) was that of **refractory masons** who reline the furnaces with fire-resistant bricks. It’s a skilled, precision trade but working conditions are incredibly difficult.

Although **Fitter and Turner** makes it onto the survey list of scarce skills, in interviews, employers said the problem was not finding qualified people, but rather that they were not able to “work at our pace” . Another employer stated that they only had need for turners. People mainly had experience in mining where “they do more fitting than they do turning but in manufacturing, the technology for fitting and turning is fairly new. So that is why we find it so hard to get experienced turners”

‘Fitting’ was mentioned as one occupation that had been displaced by computerised technology. However, there was generally less investment in advanced technology than might be expected. Metals factories have rarely upgraded their machines in the last 20 years and so in the short to medium term this did not displace labour. One Mpumalanga employer stated: “No, I don’t think in our industry. Maybe in a factory where there is a factory line, and robots can do the work. In our industry there’s physical hard labour”.

To cover the costs of an imported CNC, laser-cutting machine, would require the machine to run 24 hours a day. In the metals industry where contracts were scarce and companies were relying on manufacturing once-off products, an old-style guillotine would often make do – or metal-sheet cutting would be outsourced. The stainless steel cutting company said CAD skills are sufficient at operational level and that artisans still need to be able to operate a standard drill and saw and old lathe. Moreover, the new digital technologies did not create many new jobs. Even in a (successful) medium-sized metals company that was running on more up-to-date CNC machinery (imported from Italy), there was only one full-time IT expert.

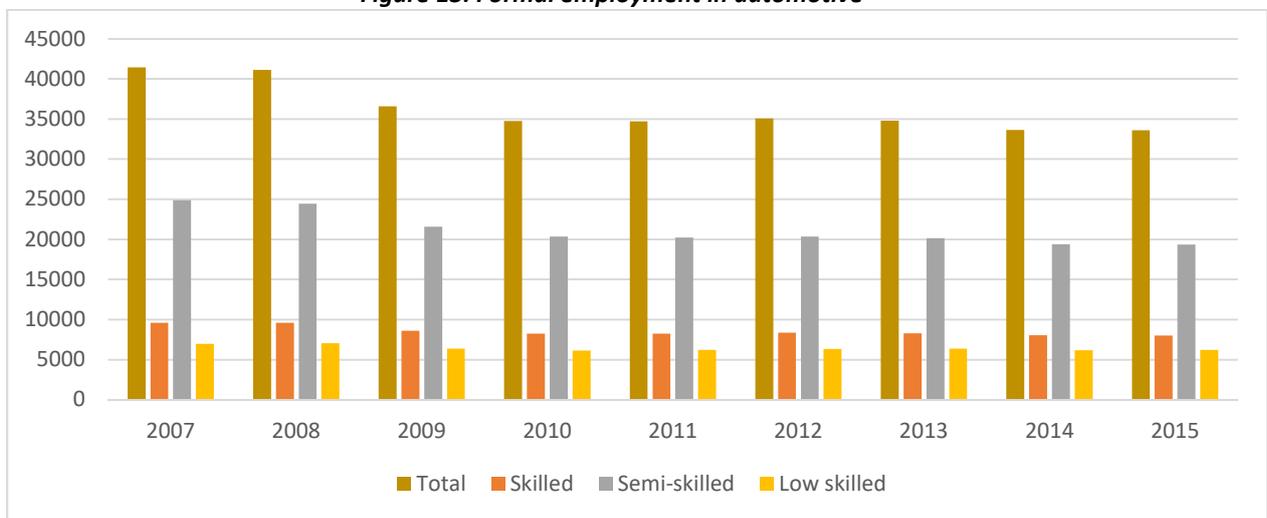
A very large employer admitted that their equipment was outdated and artisans returning to work after attending training courses were faced with the challenge of adjusting their new skills to old components. A large metals employer in Gauteng also explained that: “A lot of our processes, because they are so old, are labour intensive. Now we have a continual drive to improve productivity. ... if we put in this new equipment, it can get rid of people and therefore productivity goes up – but it costs millions of rand. We don’t financially have the money to do that right now ... We push automation

but within the confines of budget – if you don't have CAPEX, you don't have CAPEX." But there was anticipation that as the costs of automation and computing were dropping, so even smaller companies would be investing in machines. As one employer explained: "Now we need an operator to listen for when a cutting tip breaks. We just bought a lathe that doesn't need an operator at all. It has a probe that will measure the job. The only time it will stop is if a part doesn't measure right." Boiler making was said to be another job where computer technology was contributing to deskilling. "So we can use semi-skilled labour. Joins can't go wrong. We just feed the drawing file into the machine."

3.3.2 Automotive

In the automotive chamber (Motor vehicles, parts and accessories), employment numbers dropped sharply after 2008 (the year of the global recession). They have remained fairly consistent since then, though, again, its semi-skilled workers that have seen the biggest declines.

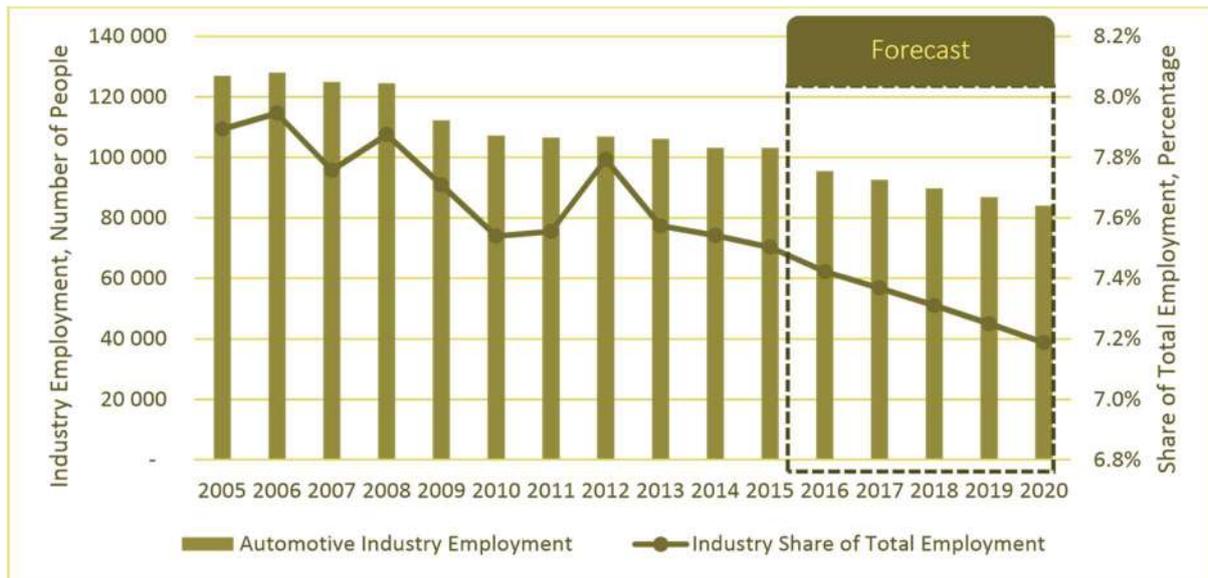
Figure 13: Formal employment in automotive



Source: Quantec, 2017 (Motor vehicles, parts and accessories [QSIC 381-383])

The graph below taken from an AIDC Economic Impact report shows a similar decline, though their employment numbers are slightly higher (as they include motor retail sic codes).

Figure 14: South Africa Automotive Industry Employment, 2005-2020, Number of People



Source: Quantec Easy Data (2016); Urban-Econ Calculations (2016).

A Numsa shop steward noted that one of their biggest challenges in the auto manufacturing sector was rapid layoffs because the industry’s economy fluctuates frequently. Employers respond quickly to economy, offering packages for older workers or going into ‘short-time’ that can result in 50% cut in pay. Although the LIFO principle usually a factor in who is retrenched, employers do try to retain those they have trained.

With business generally healthy and with a rapid adoption of new technologies (driven by OEMs and an export market), the demand in automotive sector was for more highly skilled workers – technicians rather than artisans (according to interviewees). BMW, for example, had structured career pathways to move artisans into becoming engineers. Nissan had retrenched their low-skilled staff and discontinued all ABET programmes. A shop steward at UD Trucks speculated that there were less than 3% of workers (mainly older workers) who were illiterate. The employer survey highlighted the following scarce skills in the automotive sector:

Table 16: Automotive skills demand

Occupation	Frequency
Quality Manager	10
Mechanical Engineer	7
Electrician	6
Millwright	6
Spray Painter	6
Mechatronic Engineer	6
Diesel Mechanic	4
Fitter and Turner	4
Motor Mechanic	4
Automotive Machinist	3

Here Toolmakers were mentioned as in high demand and very expensive (paid at graduate salaries) (with a new toolmaking diploma TDM to grow numbers) (N). Mechatronics was also noted as a major

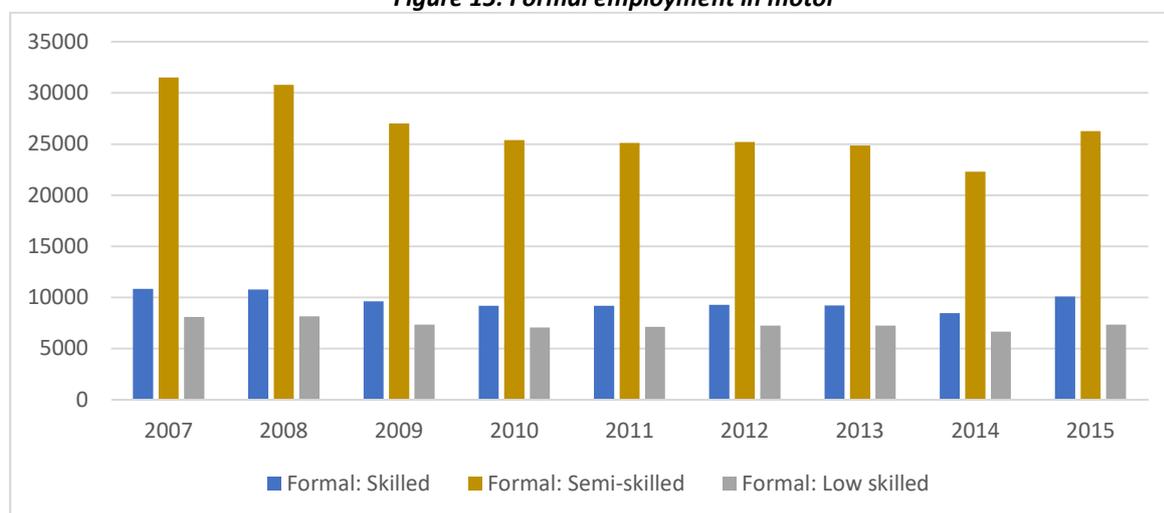
problem for assemblers but for which there was no qualification or trade test in place (N). Other skills mentioned were maintenance (millwright) and diesel mechanics (UD Trucks).

New processes or material could also create demand for certain skills. In automotive, for example, a range of new materials and “joining technologies” had created new demand for welders / panel beating. The costs of replacing parts of damaged vehicles had also over-priced the costs of repairing vehicles, pushing up the demand for panel beaters.

3.3.3 Motor

There was a consistent decline in employment especially amongst semi-skilled workers between 2007 and 2010. From 2010 to 2013, employment steadied before decreasing sharply in 2014. Retrenchments had also meant that remaining workers had to take up the slack and were having to upskill but often at the same salary level. The TU reported that especially older workers were resisting these changes to working conditions.

Figure 15: Formal employment in motor



Source: Quantec Easy Data, 2017

In the motor chamber, changes in technology to improve fuel efficiency and emission controls and the use of turbochargers and superchargers have made new demands on technician’s skills. There’s also the requirement that technicians be qualified in order for service centres to be allowed to take on work from insurers. The formal after-market sector, therefore, is generally locked into higher skills. The employer survey picked up on the following scarce skills in motor.

Table 17: Motor skills demand

Occupation	Frequency
Quality Manager	10
Mechanical Engineer	7
Electrician	6
Millwright	6
Spray Painter	6
Mechatronic Engineer	6
Diesel Mechanic	4
Fitter and Turner	4

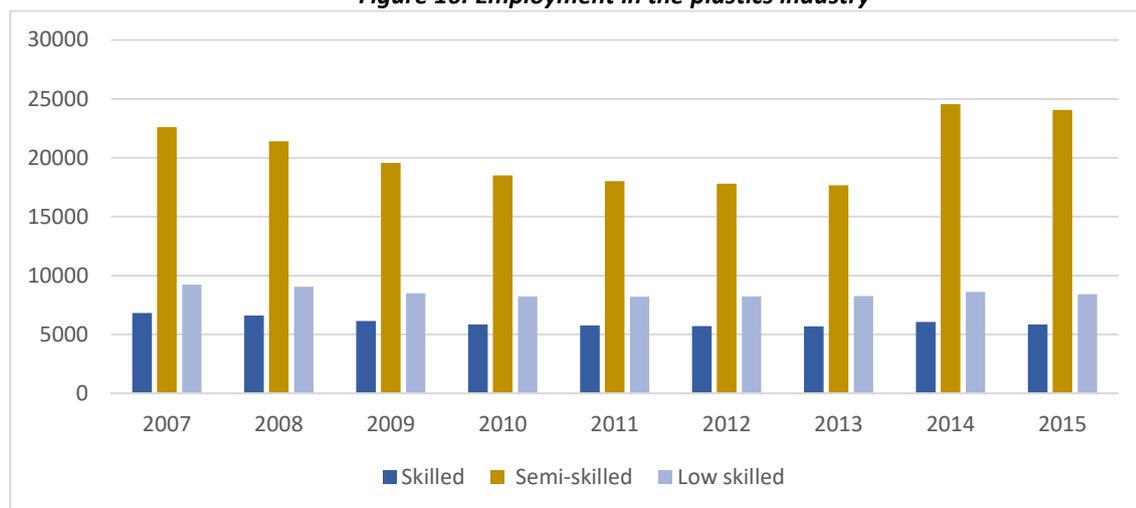
Occupation	Frequency
Motor Mechanic	4
Automotive Machinist	3

Nevertheless, even here there may be attempts by employers to expand the work of employees. One of the trade unions organising in the motor chamber (MISA) reported that they were having to deal with an increasing load of disciplinary cases over job performance – either because a person lacked skills or the job specification was not clear. It was observed that: “Employers are allowing (because of shortage of skilled employees) for apprentices to work unsupervised”.

3.3.4 Plastics

Currently, the plastics industry is under pressure with companies closing down, retrenching people and downsizing. Employer survey data shows that only 20% of the respondents increased their permanent workforce whilst 35% reduced their permanent staff headcount. Although the number of full time staff largely decreased, 40% of the employers increased the number of part time staff. In other words, as revenue declined, employers tended to employ more part time staff. The figure below shows that employment in plastics dropped consistently between 2007 and 2013, only recovering in 2014. Total employment in the region was pulled down mainly by the decline in semi-skilled labour.

Figure 16: Employment in the plastics industry



Source: Quantec Easy Data, 2017

The key work processes in the plastics industry result in demand for certain roles. Such processes dictate the nature and make-up of skills set that are required to ensure that workers are productive. Over 11% of employees in the plastics sector are semi-skilled and unskilled. This is the lowest percentage of all the merSETA chambers. 14% of workers have an FET qualification, diploma or degree (DPRU, 2014).

According to an industry association representative, during the 2000s, the industry lost people who had both technical and management skills as well as toolmakers. It was suggested that some of these people were lost to emigration. With this missing layer of skills, he says: “The result is that often you get so thinly sliced that you get people that are involved in the lower level jobs that do not have the right skills” (AH). Moreover, there are missed opportunities to innovate and link into export markets in Africa. The SMMEs visited mainly employed people as machine operators reproducing widgets –

not requiring much in terms of skills. In the employer survey the following scarce skills were mentioned (only the top 6 reported on):

Table 18: Plastics skills demand

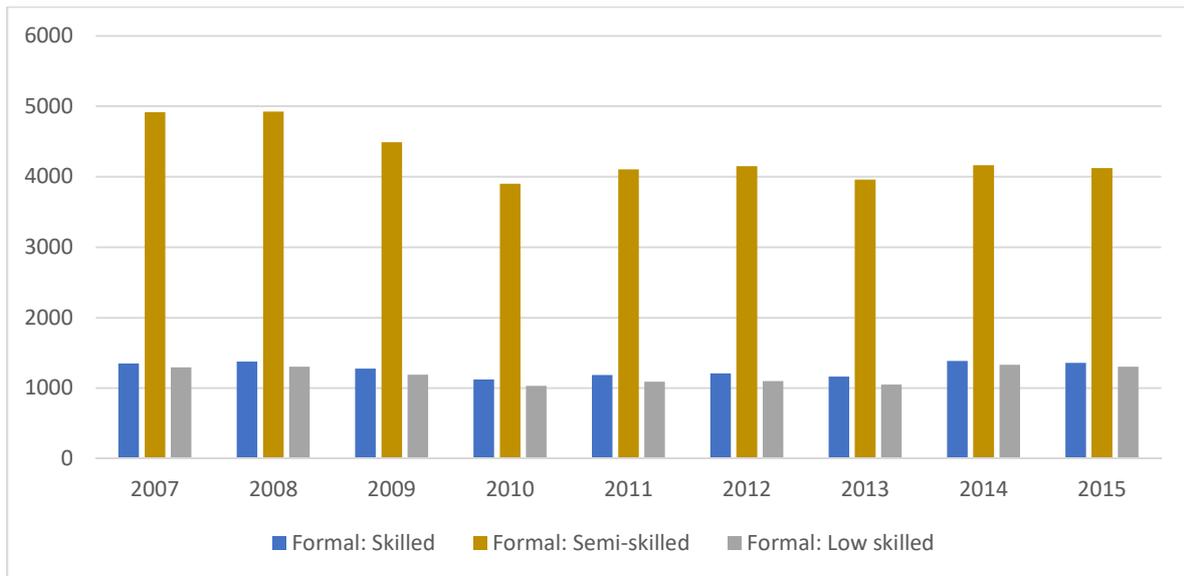
Occupation	Frequency
Plastics Production Machine Operator	8
Tool, Jig and Die Maker	8
Quality Managers	6
Plastics Manufacturing Machine Setter	6
Millwright	5
Machine Tool Setter	5
Plastics Manufacturing Machine Minder	4
Technical Director	4
Manufacturing Technician	4

Interestingly, plastics engineering is not mentioned in the list. Yet skills in design and 3D printing technology is assumed to be cutting edge in terms of changing the way that production of high performance plastics products are manufactured, allowing firms to develop and launch a range of products faster, at lower costs and with fewer risks (Centre for Competition Regulation and Economic Development, 2016). A HR manager interviewed at a NW Plastics company did say that, “the most difficult jobs to fill in our company are in the engineering side, these jobs include tool-making and robot technicians”. “We have a contingency plan to mitigate the difficulty, in the past two years we had two employed graduate engineers and we are currently training them in processing”.

3.3.5 New tyre

The new tyre industry employs more semi-skilled people than skilled and low skilled combined. There has been decline in employment between 2007 and 2015, with semi-skilled workers being the hardest hit. About two-thirds of employer respondents in this industry have indicated that their revenue have been shrinking. None of the employers indicated any increase in revenue. This could be attributed to the cheap imports that have flooded the market. With the reduction in revenue, half of the employers indicated reducing their full-time staff headcount by at least 10%. A third of the employers have increased the number of part time employees.

Figure 17: Employment in the new tyre industry



Source: Quantec Easy Data, 2017

For new tyre, there are number of interesting technologies that may affect skills in the sector. An employer stated that, “we have technology here that we sell to the mines, it’s called Tyre sense. It is a monitor that you put inside the wheel that measures the temperature and the heat, even the distance of your vehicle. The system can be put on the computer and enable the user to view machines with all their wheel position. It further enables the user to manage the safety better. You can manage it from your computer.” In the employer survey the following scarce skills were mentioned:

- Electrician
- Millwright
- Occupational Instructor/ Trainer
- Quality Manager

Chapter 4 Skills Supply

This section reports on the training activities employers are engaged in to respond to the changing nature of work as well as the skills levels in their workforce. It also provides an evaluation of the appropriateness of different education and skills development practices amongst employers.

4.1 Education and Training Provision

Across Region 1 there is at least 1744 registered education and training providers. These providers offer qualifications and learning programmes that are meant to address skills requirements of employers in the sector. The Gauteng province has by far the highest number of training providers, both in the public and private sector. The number of merSETA accredited training providers is reflective of only the registered addresses of the institutions and not their training sites. In other words, one training provider could have multiple sites of training delivery across different provinces.

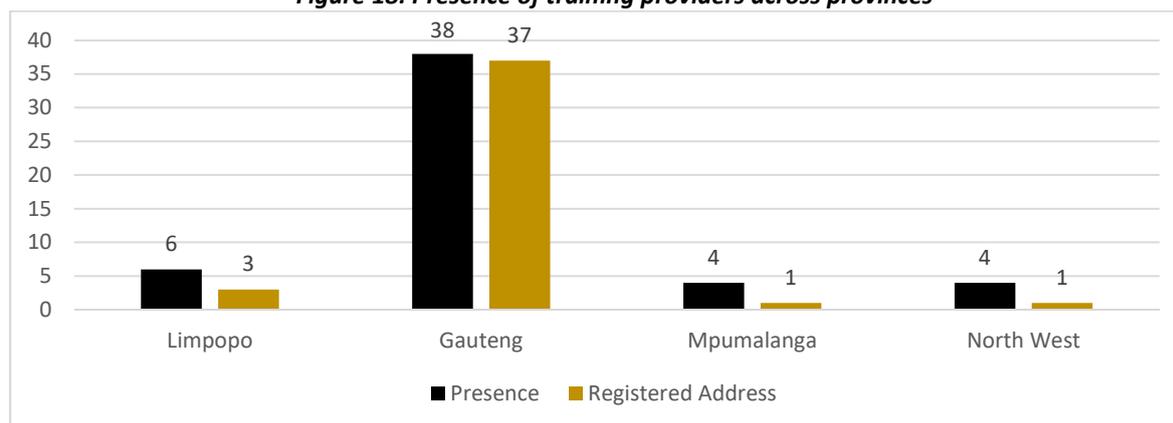
Table 19: Providers of education and training in Region 1 (Gauteng, Limpopo, Mpumalanga and North West)

	Gauteng	Limpopo	Mpumalanga	North West
Public Universities	5	2	1	1
Public TVET Colleges	8	7	3	3
MerSETA accredited training providers	1592	37	69	16
Total	1605	46	73	20

Source: DHET, 2017

In the survey of training providers, although limited in number of respondents, it was reported that the 51 training providers accredited with merSETA had a total of 99 training sites spread across all provinces. **Error! Reference source not found.** shows that within Region 1 there are more training sites than the actual number of registered training providers located in a province.

Figure 18: Presence of training providers across provinces



Source: merSETA survey of employers, 2018

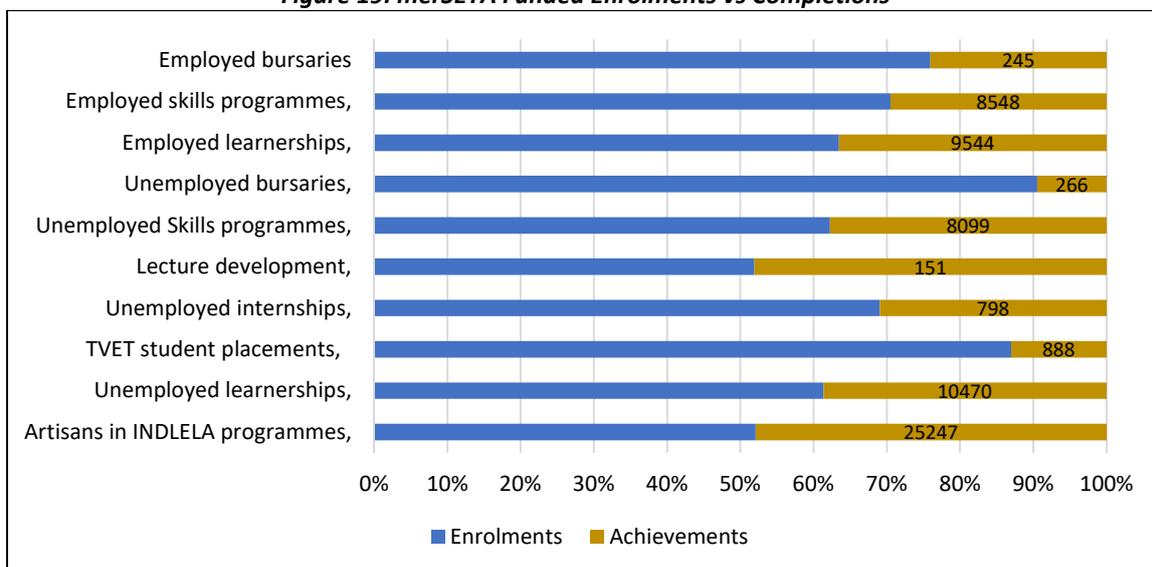
The employer survey further showed that 47% of employers believed there are sufficient accredited training providers close to their business operations with 27% indicating that they don't know if there are such training providers. Employers indicated that at times it is not the question of availability of training providers but the lack of competition amongst the training providers close to their businesses.

Others noted the lack of accredited training programmes in specialised work areas such as computer aided design.

4.1.1 Delivery of training in the region

As already indicated, training delivery in the region is through a mix of education and training providers including public universities and TVET colleges, private training providers as well as through internal training. Results of the employer survey in the region show that the highest proportion of employers (79%) train in house followed by the use of private training providers (46%). According to the National Skills Development Implementation Report (2017), since 2011/12 to 2015/16 merSETA has funded the following enrolments against its learning programmes and achieved below completions:

Figure 19: merSETA Funded Enrolments vs Completions

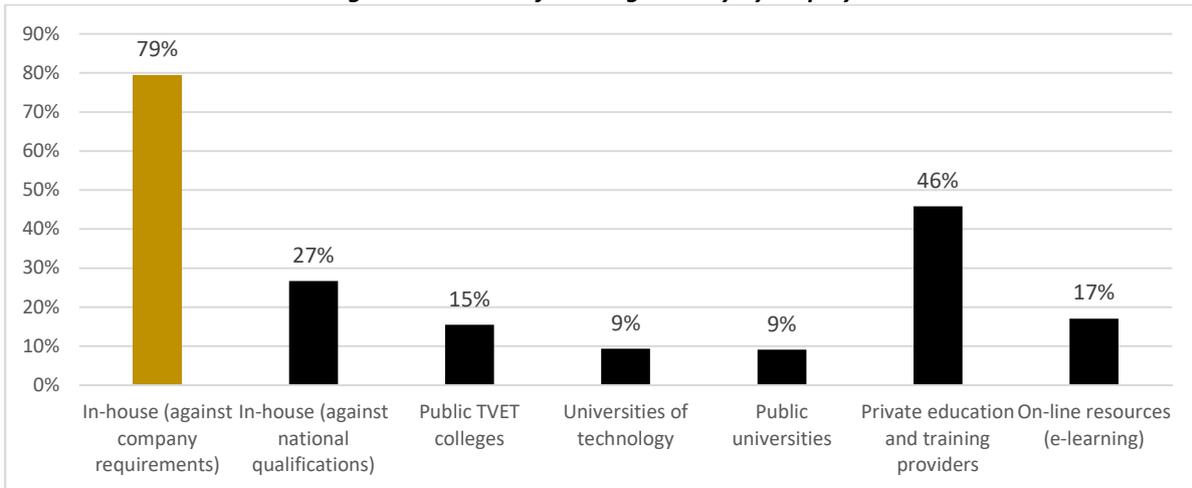


It is clear that apprenticeships and learnerships form a crucial part of the supply of skills to the sector. The merSETA has a total of 76 registered qualifications that it continues to enrol learners against; ranging from level 1 to 5 – in order to cater for the varying occupational categories.

It was reported that SMMEs are training mostly on the job due to limited budgets as well as the war for talent which is making it difficult to retain trained employees. Where small and medium sized employers are training, they predominantly utilise private training providers. A training provider in the North West province said that they received a lot more demand for training from smaller companies because they don't have the capacity and capital to train their own employees. Another training provider said the same thing: "the big companies train their own people and we train people for small companies".

Large employers, especially in the motor manufacturing sector, provide product specific training which is suited only to their internal needs. About 27% of employers reported utilising internal training academies which are accredited to provide training. Although there is some use of public institutions including universities, TVET colleges and universities of technology, these do not enjoy the high popularity amongst employers as private and internal training provision.

Figure 20: Model of training delivery by employers



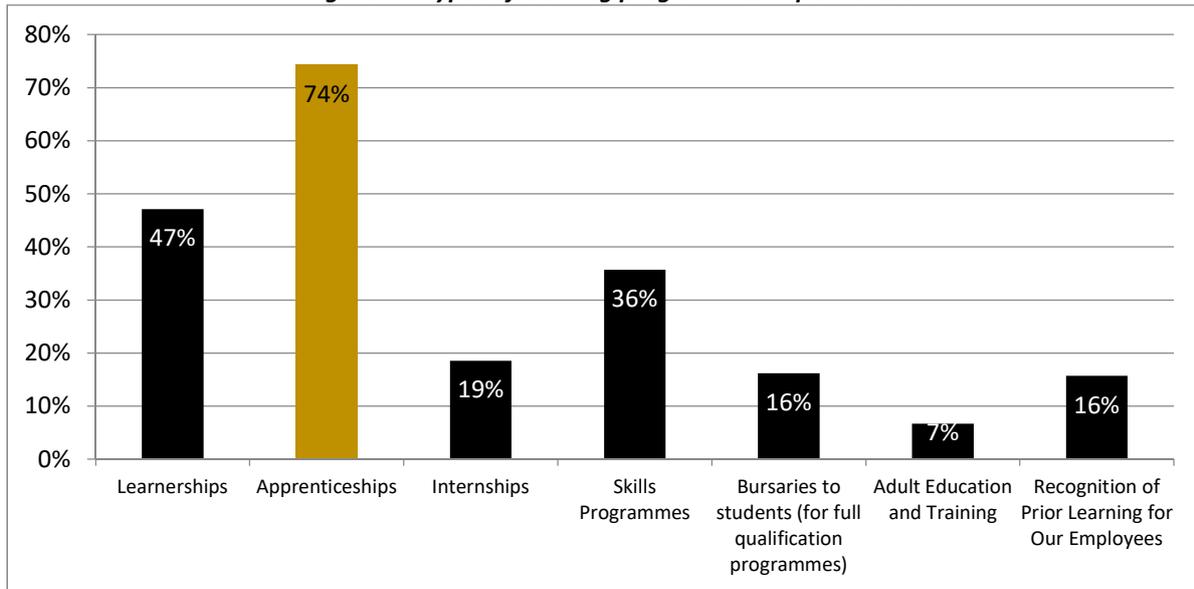
Source: MerSETA survey of employers, 2018

Employers are also reporting the use of e-learning resources to provide training for their staff. With the advent of connectivity, e-learning is becoming a cost-effective model of training delivery amongst employers. The internet was fast becoming an important tool for learning. Said one employer “Japie will surf internet at night and want a new tool in the morning. ... You can learn how to treadmill on YouTube.” One of the large metals employers said that they were starting to use virtual reality for training purposes. The HR manager explains: “We’re becoming more autonomous and embracing e-learning and m-learning (mobile learning). With our new intakes we are starting to trial tablets. Assessments are electronic and automatic. We are embracing virtual reality for our safety related courses – into augmented reality – so you can take a picture of a machine on a cell phone and overlay augmented reality with sketches – click for step-by-step processes. Micro-learning is a big thing. I’ve developed an app for micro-learning – as they come in, it says ‘welcome to ABC. What are you going to learn today?’ Just-in-time learning is important for our knowledge seekers today – a 3-4 min video clip on what they need to do (just before they need to do it).” One of the employer organisations pointed out that because many of their members (in the motor chamber) worked on commission, there was a preference for on-line training.

4.1.2 Types of Learning Programmes

Employers within the region are implementing various learning programmes depending on their operational needs. When asked which SETA accredited or funded learning programmes were implemented, about 76% of employers surveyed indicated that they implemented apprenticeship programmes, followed by learnerships (47%) and skills programmes (36%). Although employers are investing heavily in these programmes, they are also providing on-the-job training for their staff to address immediate changes to production methods.

Figure 21: Types of learning programmes implemented

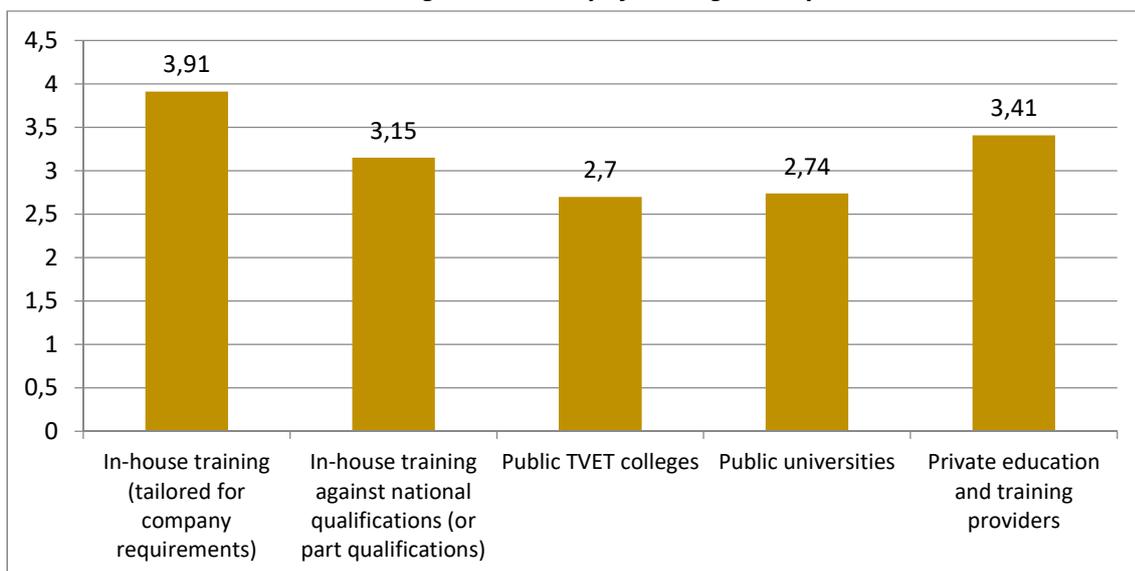


Source: MerSETA survey of employers, 2018

4.2 Quality of Training

The vast majority of survey respondents claimed to train in-house and it also scored it the highest in terms of the quality of training. Just over 57% of employers surveyed thought the quality of training of accredited training providers was 'good', compared to just 9% who said it was not. About 34% indicated that they did not have an opinion about the quality of the training. Amongst the different education and training providers, in-house training and private training providers scored median scores above the average of 3 on training quality as compared to 2.7 for TVET colleges and 2.74 for public universities. In other words, employers within the region have a dim view of education and training provision by public TVET colleges and universities.

Figure 22: Quality of training delivery



Meanwhile, 20% of employers thought there was “a good pool of public TVET college graduates to recruit from”, while almost 38% thought the contrary. Interestingly, 42% did not mark an opinion on TVET college graduates, mostly indicating that they were not recruiting from the colleges. In the interviews, there was not generally high regard for TVET programmes – dismissed as theoretical or a “waste of time”. A company owner says of a millwright he employed: “he went on a 2-3 week training prep in Kempton Park and then went to write his N6 – but it’s a waste of time. He can’t even do basic electrical (reverse direction on a three-phase motor) – though he did it in college”. Entry-level welders had also disappointed him: “CO2 welders need to push the torch into the gas – but they come here and pull the torch. He has done the theory – but no practical.” In a different setting, a training manager in a motor organisation reported: “The programmes offered at the TVET colleges do not speak to manufacturing processes.”

Questions were also raised about the quality of tertiary graduates. Few employers in the survey (just 16%) said they had “a good quality pool of university graduates to recruit from” – and 38% answered ‘no’ to the question. One interviewee told of a young-graduated project manager who seemed to be out of touch with the job at hand and the challenges being faced on the production line: “He’ll sit in his ivory tower in the northern suburbs in an air-conditioned office. He needs to come here and know the frustrations of bad drawings and steel that’s not up to specification. There is a huge divide between those with tertiary knowledge and those working here. Mining used to give you very decent training. People under-estimate the guys out here – they think they are a bunch of bananas but they are so alert to what’s going on. They are like the hound dog – that gets whipped to death but some of what they do is sensational and they don’t get the accolades they deserve.”

There were serious concerns raised about the quality of training for artisans. In Mpumalanga, a training provider remarked: “I’ve got some people here that are qualified boilermakers. They have the red-seal and everything. Then I give him a test - I’ll show him a picture of a hammer and ask him what it is, his response will be, “that is something to hit with”. The HR manager of a stainless steel cutting factory also complained that the training of artisans was not up to scratch: “if you get someone with papers and you put him on a job, you realise very quickly he doesn’t have the knowledge.” An operator “takes three years before you get him through all the various scenarios – and then there’s still 25% to learn over 7 years”. A large metals employer concurred: “The national curriculum for artisans is too low for what we need.” The NCV was also not up to scratch. A fitter, for example, will learn how to align a motor and gearbox using a DTI – technology that’s been replaced by lasers. There was credit, however, that the qualifications were slowly changing through the QCTO and NAMB.

One manager in an automotive company argued that the standard of training materials was deficient. “Sometimes in some of the catalogues, you can see that it is outdated. If you compare a manual from merSETA and one from a university on a specific topic. You can see that there are differences between the two, you can see that one has the expertise. I have not found that the merSETA material can be used, especially for the standard.” “Sometimes I think it is the red tape that bogs things down. By the time something gets released it is out of trend and we don’t need it anymore.” A trade union interviewee echoed a similar sentiment: “merSETA does need to engage with stakeholders on the ground more. With changes that are happening, they get left behind. By the time a qualification is registered, it’s not needed.”

A trade union representative argued that the Retrenched Employee Programme (REP) – which covers 50 credits or six months – is “very minimal” and does not prepare retrenched workers to set up their own small businesses. They explain: “Currently they can do steel fabrication, welding, burglar doors. But what about manufacturing of components that are supposed to be used in an automotive - can they be able to do that? The answer is no – because of the level of skill that they are exposed to whilst they were employed and in the programme as well and that is the challenge we have. The programme is meant well and we are trying because we have actually registered a number of cooperatives out of those retrenched workers but they got stuck because they could not have money to buy tools.”

4.3 Training dynamics in the region

4.3.1 Metals

Employers in the metals industry indicated that training was one of the first budget items to be cut when business was in decline. Nevertheless, given that many employers were relying more and more on low-skilled workers, there was a clear need to upskill (though usually informally). One medium sized metals employer explains: “I spend a lot of time outside and with a lot of repetition and there’s no such thing as a bad question. A lot of it is developed on fancy software – produces an enormous amount of paperwork and is extremely confusing. And if people come in and are not completely at ease with reading and writing – just come here and we’ll talk about it over again – at the end of the day it’s a confidence issue.”

The larger companies tended to rely more on formal training processes and often had their own training centre. Arcelor Mittal has 1500 people in its development pipeline currently (2017/2018), enough to replenish its turn-over. According to the HR manager, they “prefer branded (in-house trained) people.” Currently, in the development programme there are:

- Over 700 artisans (electricians, millwrights, instrumentation, fitter-and-turner, welders, boilermakers, rigging).
- over 100 engineers at university.
- 40 – 50 technicians at universities of technology.

In addition, they have a large number of learners being trained in the production processes.

The development pipeline provides support to learners from school (they offer maths, science, English and computer studies at after school centres) to university, technicians, apprentices or production learners: “we call it the cradle to the grave”.

An Accelerated Artisan Programme condensed the 4-year experiential training period into 18 months (though they now comply with the QCTO’s three-year programme). It includes 54 weeks on the job training in the plant and the institutional training. Apprentices do specialised courses, advanced courses, professional skills and they work in a maintenance pool, under mentors, so they get a vast experience in different areas. Engineers go through a two-year candidate programme

The HR manager explains that: “There’s no reward for it – it costs us money – but our point of view is that the apprentice becomes productive at neutral cost to the company in 2.5 years – so there’s value add to the company based on their salary and input costs. So in that phase, we pay them higher than a learner and less than an artisan because they’re in a training programme but they start to add a profit to the bottom-line.”

Other metals companies that used to have large training schools such as Skaw, Consol, McKenlie Bros have closed them down. One interviewee said: “I think there’s no incentive to train them [artisans]. SDL is used as another form of taxation. ... But we have some young guys here that show promise and at my expense, I have sent them to school”.

In another medium-sized metals company, of the 100 workers, only 12 were qualified artisans. The owner said most of his semi-skilled staff had been trained up from unskilled tasks (cleaners and grinders) into taking on more responsibilities. “As soon as they qualified, they go work in the mines – they steal them from you. So that’s why we don’t qualify them – we keep them as semi-skilled. They get skilled salaries,” he explains. The only formal training offered is for machinists who attend CNC training as technology gets upgraded (usually a nine-day course – 3 days over 3 sessions).

4.3.2 Automotive

If metals companies were training up their own artisan skills, the automotive companies were looking for certified artisans. Once employed, they are streamed into continuous development programmes and supported through bursaries for further study. But getting into the automotive sector was extremely competitive. One assembly plant (BMW) reported that of they received 4000 to 5000 CV’s for 30 apprenticeship positions. Another (UD Trucks) had only about 50 apprentices in their national intake at any point in time.

All the automotive assembly companies had training centres. Generalised training was not considered to be sufficient to handle the specifics of an auto product. At BMW, for example, the prediction was that there would in future be a greater need for technicians, engineering students and software developers. But the precise nature of those skills was dependent on the direction given by the parent company in Germany. “The problem is that it has to be BMW specific skills ... For instance, the robots we use are BMW specific. The way they use it and the systems that they use are unique to BMW. So, we can’t get a guy from Nissan for example. He won’t be able to use them.”

Similarly, although the anticipation was for hybrid and electric cars to flood the market in the next ten years, it was unlikely that the training would be local. According to one respondent, although currently there are just two people certified to work on high voltage electric cars: “even guys who have been working here for 20 or 25 years won’t be able to work with them or even to touch them.” BMW apparently does not recognise local electrical qualifications. When electric vehicles are assembled here, the engineers and technicians will need to do their training in Germany.

UD have a Competency Development Centre headed by a training manager, though they also rely on external providers to deliver training. New entrants for diesel mechanics and millwrights are trained by private providers and then placed in a training workshop before gaining work exposure.

In addition to the OEM training centres, since 2000, the Gauteng Province has provided specific institutional support to the automotive sector with the establishment of the Automotive Industry Development Centre (AIDC). The main focus of the AIDC is to support skills development and training in the automotive sector, as well as to facilitate investment, ensure development of the automotive supply chain, encourage enterprise development and incubation programmes.

The AIDC is working closely with TVET colleges in Gauteng, helping to place students in the automotive sector for the practical components of their qualifications (autotronics, mechatronics, welding, motor

mechanic, diesel and petrol, auto body repair, boiler making, auto electrician), as well as supporting lecturer training. The AIDC also has a plan to open its workshops to TVET lecturers and students to gain some practical experience and to handle the tools of their trades. Courses offered include health and safety, role of a supervisor, quality tools and visual management, automotive components and manufacturing assembly and dealership network training. The plan is to have up to 250 learners / week (in groups of 15 students). The AIDC (which is accredited with the international Institute of Motor Industry) has recently earned its stripes as Trade Test Centre and plans to offer an RPL service through NAMB. The OEMs (BMW, TATA, Iveco, Ford and Nissan) have provided support particularly donating equipment.

There's also been a focus on SMMEs in various townships, with assistance being provided to identify skills gaps and advise on the level of training needed. One of their training sites is the Winterveld Enterprise Hub: Automotive (WEH). Winterveld has always had a strong, yet largely informal, automotive presence. The purpose of the hub is to expose the local SMME's to modern auto body repair equipment and methodology and to formalise and develop their businesses by facilitating economic transformation within this area. Artisans receive mentoring and training from Master Artisans located at the facility. Training is a combination of practical learning in spray painting and body repair, as well as business mentoring. The aim is to develop Township enterprises. The project will continue to focus on body repair work (with increased levels of government vehicles anticipated) as well as providing training and mentoring into the 2016/17 year. Business management training will be done in collaboration with educational institutions (e.g. UNISA).

The AIDC's Automotive Incubation Centre at Ford Motor Company South Africa (FMCSA) provides training and business support to BEE SMME start-ups in the automotive industry. Aimed at BBBEE companies entering the automotive industry (with the incubatees being the business owners), the project assists them to overcome the high barriers to entry and become successful participants and contributors to the industry.

Trade Union Solidarity established its own training centre in Pretoria, Saltech, 10 years ago. The centre is intended to provide training opportunities for apprentices that were lost after the State-Owned Enterprises scaled down their training centres. Saltech was also set up in response to the growth of training for profit. Explains the Solidarity rep: "Training should not be about money." Although students pay for the training, it is subsidised by union dues – of the R130 membership fee, R10 goes towards the training centre. "You get the grants from the SETA but it does not pay for capital investment." A final motivation for setting up Saltec was the need for training in Afrikaans as first-language. Saltech currently trains up to 1000 apprentices in seven trades and helps with job placements. They are looking at introducing newer trades such as mechatronics.

According to a representative of organised employers, while the SETA was "doing very little for the steel and engineering manufacturing sector", the automotive sector has successfully lobbied merSETA for resources. The statistics, however, show that although the Motor and Metal subsectors do not train the largest proportion of workers, they provide more training per trainee than the other subsectors (Bhorat and Naidoo, p14).

4.3.3 Plastics

Workplace training is a key component of skills development in the plastics sector. This takes many forms including employer-initiated training, merSETA funded training as well as industry organised training. Campbell argues, in relation to the Plastics Sector, that: “The merSETA’s emphasis on apprenticeship greatly disadvantages their sector. For the plastics sector skills development is primarily achieved through skills development and learnerships but accessing funding for that is difficult since apprenticeships are given priority” (IOMOT paper, p1374). Campbell points out further challenges to skills development in plastics:

- No FET colleges offering plastic related trades
- No universities offering undergraduate programmes in plastics.
- The recent mandatory grant regulations changes might greatly reduce the amount of training occurring in the sector as the industry is SME dominated.
- Lack of urgency in implementing the Setter trade which would immediately address the most pressing concern for the plastic sector “(IOMOT paper, p1374)

Workplace training is a key component of skills development in the plastics sector. This takes many forms including employer-initiated training, merSETA funded training as well as industry organised training. Every year Plastics South Africa organises training for stakeholders in the sector. Plastics SA has a training centre in Midrand which trained 1676 learners in 2015/6 (Plastics SA Annual Report) (3352 trained nationally by Plastics SA). Amongst its training programmes, the following were customised: Pipe Extrusion (NQF Level 4); Settings for Injection Stretch Blow Moulding (NQF Level 4); Use Fabrication Tools and Equipment (Component of Polymer Composite Fabrication NQF Level 2). The National Artisan Moderation Body (NAMB) in collaboration with the industry has developed the Plastics Manufacturing Machine Setter Trade qualification (NQF level 4). However, at the moment there is no TVET College that has the necessary equipment and trainers to teach this qualification. Engineering plastics production typically require more advanced capabilities (design, prototyping and 3D printing) offered by universities.

Specialist engineers (beyond first degree) are reportedly not produced in a quantity that is sufficient for the growth of the plastics industry. Similarly, at an operations level, mould-setters and plant operators are also in short supply due to new competency demands arising from innovation and technological development. The availability of trained and experienced artisans remains of critical importance to the industry (PlasticsSA, 2017).

4.3.4 New Tyre

The new tyre industry has been identified as one of the sectors with the greatest proportions of unskilled and semi-skilled workers. Over time, the New Tyre sub-sector has experienced more and more automation. This has led to a decrease in the need for lower-skilled workers and an increase in the need for highly skilled workers. The pool of trained individuals needs to increase in order to deal with supply and demand in the sector. In addition, there is a growing need for individuals who have practical and theoretical experience to function within the supervisory roles in the sector.

New Tyre manufacturing has a small footprint in Region 1. Bridgestone has a factory in Brits (North West) which has recently invested in a number of new technologies such as upgrading to Variable Intermesh Clearance Mixing technology that will have implications for training. It also plans to bring in

new steel calendaring technology, which will cut steel wires even thinner than with existing technology. These machines will be operational by 2020 (Engineering News 19.7.2018).

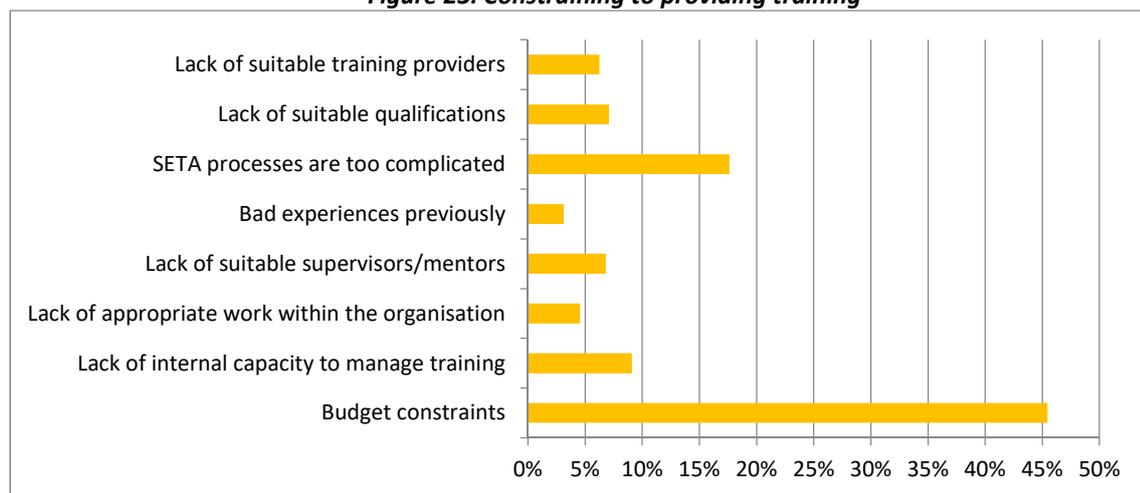
Rema Tip Top produces mainly conveyor belts and tyre repair systems at a factory on the East Rand. There is a brand training centre attached to the factory that offers regular workshops (such as customer service, product awareness and performance reviews) as well as training in full qualifications including production technology and rubber manufacturing.

In-house training has been necessary because there is very little training available specifically for the industry. According to a 2012 report published by merSETA: “there was consensus that there is a sufficient pool of artisans to employ from, but that the base skills set of the pool was misaligned with the requirements of the tyre industry”. In higher education, industrial, chemical and electrical engineering are relevant to the industry. There is also a BTech in polymer/rubber technology (available from Nelson Mandela Metropolitan University). According to Mangcu (2017), there has been inadequate attention given to research and development in tyre recycling

4.4 Constraints to Training

The employer survey asked respondents to indicate what the main constraints were to offering training. Budget was most often cited as a limiting factor. Difficulties with navigating SETA processes was the next most marked impediment to training. Employers in Mpumalanga also mentioned that poor basic education, especially in maths and science, has far reaching implications for skills development. One employer stated: “these guys are hardworking labourers, some of them are qualified already. You get nowadays with grade 12, but all the wrong subjects, like Life Orientation, Geography, History and no Maths or Science. It makes it difficult in recruitment because if they apply here for a job, and he says he wants to be a welder, I’ve got a problem with your grade 12.”

Figure 23: Constraining to providing training



Source: merSETA survey of employers, 2018

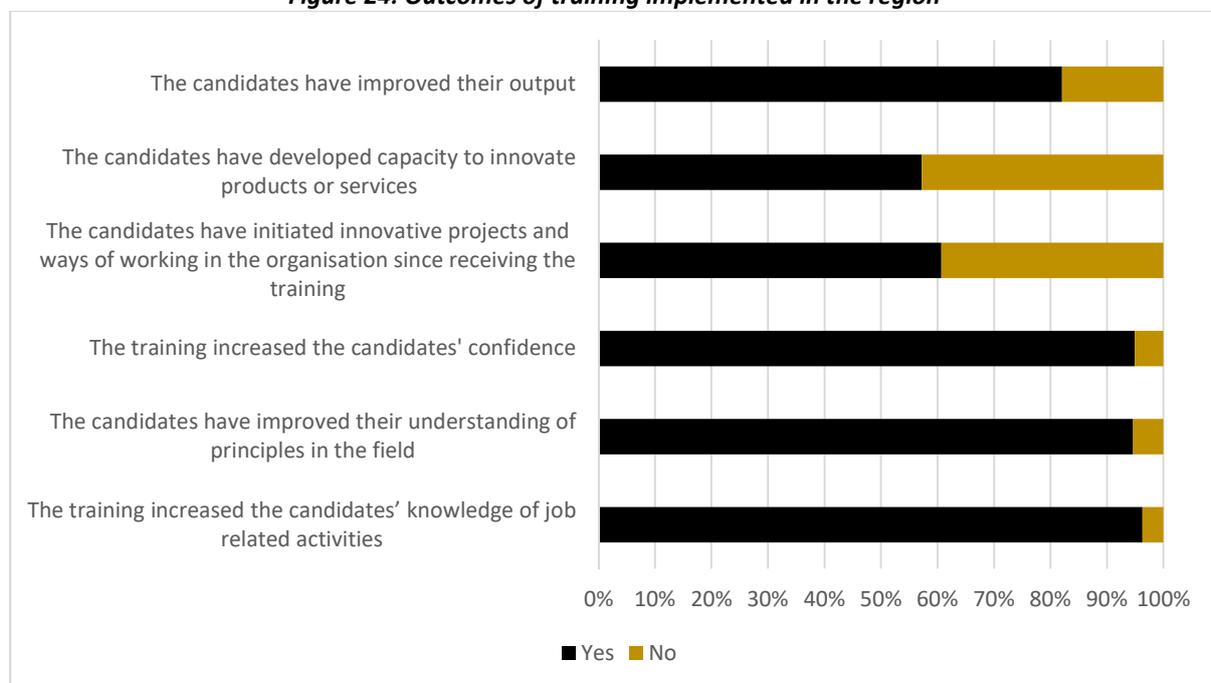
During interviews employers further indicated that one other challenge in training provision is that of learners who do not complete their training. Learners who are employed typically have challenges with completion of portfolios of evidence whilst those that were unemployed before the training programme either find alternative employment, demonstrate lack of interest in the programme or

have family responsibilities or other impediments that force them not to complete their training programme. Although employers indicated that a higher proportion of employed workers completed their training, there was a challenge amongst younger workers not displaying necessary discipline to complete on time.

4.5 Outcomes of Training

Although there are some concerns about the quality of training implemented within the region, generally employers are reporting some positive outcomes. The employer survey showed up generally positive views on the benefits of training. As many as 82%, for example, indicated that training had resulted in improved output. In an interview, a trade union shop steward in the automotive chamber agreed that workers were better skilled (and better paid) as a result of the establishment of the skills levy which had stimulated employer’s willingness to invest in worker training. In the company where he was union representative, the Workplace Skills Plan (WSP) was signed-off by both management and labour.

Figure 24: Outcomes of training implemented in the region



Source: merSETA survey of employers, 2018

Amongst the positive outcomes of training employers indicated that:

- The training increased the candidates’ knowledge of job related activities (96%)
- The candidates have improved their understanding of principles in the field (95%)
- The training increased the candidates' confidence (95%)
- The candidates have initiated innovative projects and ways of working in the organisation since receiving the training (61%)
- The candidates have developed capacity to innovate products or services (57%)

Chapter 5 : Conclusion

This study started from the premise that the demand for skills was driven both by political and economic factors. On the economic front, the merSector has been on a backfoot especially in those chambers that have had to compete with cheap imports (metals, plastics and new tyre). That has constrained demand on employment, particularly for semi-skilled workers. A decrease in employment has, however, appeared to add to the need to upskill the workforce in order to maintain production.

On the political front, government's industrial policies, such as the NDP and IPAP, plan to grow manufacturing (including merSector industries) by encouraging localisation and beneficiation, supporting SMMEs and fostering the adoption of advanced manufacturing. These policies assume that skills will be packaged accordingly. The policies themselves do not clarify what those skills might be, and so this study tested with employers and trade unions:

- whether the manufacturing policies had traction on the ground; and
- if so, what skills were needed to support those policies, or
- if not, what skills industry was otherwise needing.

The study was also interested in how skills were being supplied and what opportunities existed to improve skills development.

This research study was wide in scope, reaching down to a provincial and chamber level and covering the views of government, employers (large, medium and small), trade unions and the informal sector. It is perhaps not surprising therefore that there are divergent views on the direction the merSector ought to take. Views were expressed in favour of developing high-level skills to support advanced manufacturing and, in quite the opposite direction, of developing the skills of lower-level workers. There was support for localisation and beneficiation but also scepticism amongst some employers (in the motor chamber) over the economic logic of this. Opinions also differed on whether SMMEs were the right focus for growing manufacturing capacity, when currently formal skills development was being driven by larger employers.

These divergent views complicate things for the merSETA. For it to demonstrate 'impact' it could choose any number of principles such as training the largest number of people; or training to have the biggest impact on GDP or training to support developmental goals (e.g. grow SMMEs). It is clear that the merSETA's task is not simply one of aggregating current skills by scarcity. It is also one of weighing up political and economic drivers of future skills for manufacturing within its industries. In this context, the merSETA's role is to mediate or facilitate the different views. At best, that would result in greater collaboration so that competitors in the manufacturing sector can realise collective learning. That would mean convincing employers to come to a common understanding on which skills are needed and invest in their development above and beyond their own firm-specific needs. There are implications for merSETA in taking on this mediating role:

- Intensify efforts to reach agreement on the need to develop skills whilst simultaneously expanding employment. This means the SETA would need to open up a discussion with employers and unions on how, in the short to medium future, the industry can improve on skills to work on more advanced technology without shrinking the number of workers. This

could be done through improving the efficiency (productivity) at current levels or expanding opportunities for manufacturing.

- The SETA will also need to mediate opportunities for workers retrenched because of the introduction of new technologies or because businesses have closed down. The SETA can try ensure that they are retooled to remain relevant in niches that open up in the merSector or identify gaps in the value chain in each of the chambers that displaced workers can fill. Alternatively, the merSETA will have to be prepared to negotiate with other SETAs (particularly those in sectors related to manufacturing and transport) to retrain displaced workers to take on employment in other sectors.
- There is also a need to build capacity in the SETA to grapple with the complexity of the challenges facing the manufacturing sector and to broker agreements on how to address them (brokering role of SETA)

There are several ideas arising from this study on how the merSETA could support more efficient manufacturing:

- Invest in upgrading artisans into 'master' artisans. Such skilled people would be highly skilled in their trades, would be able to foresee (and prevent) production glitches and quickly and efficiently sort mistakes out. They could also quickly adapt to changes in production methods brought about by advanced technology. Master artisans are especially needed for welding, fitters and turners and boilermakers; motor mechanic and automotive electrician.
- Concentrate on producing production specialists – people (most likely 'master' artisans) who understand the production process from beginning to end, who can trouble-shoot and identify key interventions in the production line that would improve efficiency. Such production specialists are also the most likely to be able to branch off from large companies to develop successful SMMEs.
- Invest in training auxiliary or specialised skills. Due to the changing nature of work there are specific specialisations that are required in production environments. Employers, especially SMMEs, mentioned the need for people to do specific, sometime repetitive, tasks and that these were mainly trained in-house. People who work in those environments need not be fully qualified artisans but require some specialised training. These could be stepping stones for people pursuing artisan trades or final destination certificates. Although these skills might not make it onto a scarce skills list and may even be missed on a critical skills list (because they do not seem to be immediately in demand and may not be needed in large numbers) auxiliary skills could make an important difference to efficiency. Production specialists (mentioned above) are the key to identifying what these 'niche' skills are. Examples taken from interviews include under-water welding, plastic welder, plastics cable-making machine operator, wheel alignment technician and refractory masonry.
- The SMME sector is an important focus for government policy yet it appears that SMMEs in the merSector have struggled to survive and many have closed shop (especially in metals). SMMEs appear to be employing low-skilled workers and so supporting them to upskill their

workers should make a big difference to their productivity. Yet SMMEs rarely accessed SETA funding citing lack of awareness or bureaucratic processes as a stumbling block. The merSETA needs to make it easier for SMMEs to access mandatory grants.

- Advanced manufacturing is mostly imported and often requires vendor training that is imported, often unaccredited and self-funded. merSETA should consider how such training might be funded and accredited so that skills learnt are transferable and lead to articulation and upward mobility. merSETA could learn from other SETAs who have had to deal with vendor training (such as MICT SETA).

There were also ideas brought up by stakeholders through this study on how to expand manufacturing:

- Support localisation through developing skills in merSector market analysis or through linking manufacturers (and especially SMMEs) with business analysts to identify new product lines for the South African consumer (and even for the export market). merSETA could be working with the Technology Innovation Agency, CSIR, IDC and other players in South Africa's national system of innovation. When initiatives such as the Black Industrialists Programme are being implemented, the merSETA could position itself to be a skills development partner.
- Support SMMEs to take advantage of beneficiation (especially in the metals sector). This may require merSETA to act as a broker between larger companies and SMMEs to help build partnerships for skills development along value chains. In other words, bigger firms could provide training to SMMEs (in both technical and business skills) so that the SMMEs can take advantage of opportunities that spin-off from larger manufacturers. Investing in skills in a fledgling SMME sector does have risks since they are more vulnerable to closing shop because they lack basic business management skills. On the other hand, training emerging businesses could help in their sustainability especially in skills related to project management, business development and HR coupled with financial capacity to sell high quality products at the lowest possible price.
- Invest in high-level skills in research and innovation. New products, opportunities for beneficiation and localisation may need investment in innovation that will most likely come from high-level research skills in universities and universities of technology.

Manufacturing in South Africa has been through difficult times recently, with global competition weighing heavily on output and profitability. Demand for skills has added to the slow down by drawing attention to inefficiencies in the production process. Companies have also been unable to take advantage of new procedures or technologies where such have needed skilled technicians or artisans. Moreover, lack of skills may also be behind why companies have not moved quickly into new niche markets with innovative new products.

At the same time as there is demand for skills, there is also a slow-down in employment and in absorption of skills. It seems manufacturing is in a catch-22 situation – on the one hand, production needs skills to improve efficiencies and profitability, but on the other hand, investment in skills is hampered by the lack of profitability. This again emphasizes merSETA's role as broker – to support and facilitate employers to invest in more training and see the long-term benefits.

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Appendix 1: Gauteng Province: Demand and Supply of Skills

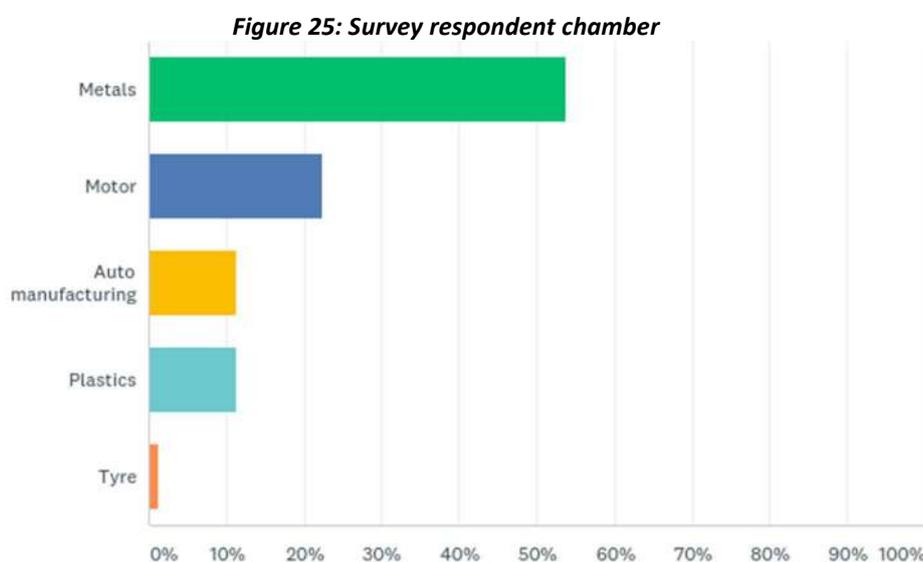
This report on the merSector in the Gauteng Province starts by analysing the provincial industrial strategies to impact on the merSector. The strategies have implications for skills development and therefore offer insight into the training demands the provincial government is proffering to the electorate as solutions to economic productivity and unemployment in Gauteng.

This is followed by an analysis of the economic fortunes of the merSector in Gauteng and the impact of this on employment numbers. The intention is to understand how industry responds to the economic climate by adjusting employment and skills of labour. With context set, the report then addresses which skills employers report as scarce and how they respond in terms of skills development.

a. Methodology

Data for this report was sourced from secondary literature and statistics as well as interviews conducted with employers, trade unions and training providers in Gauteng. To provide quantitative scale to the findings, a survey with employers and with training providers was electronically sent out and answers analysed. In addition, a field survey was conducted of informal businesses.

The interviews conducted with employers covered issues on business performance, employment hiring trends, training practices and skills needs. Interviews were transcribed and analysed. The strength of the interview data is the depth of detail researchers were able to go into to connect the economic factors driving the employment of skilled labour and where there were resulting gaps in skills.



Source: merSETA survey of employers, 2018

Responses to the survey are fairly well aligned to the distribution of merSETA employers in the GP. There was a slightly greater proportion in the auto sector which are predominantly motor in nature that responded and slightly fewer in the metals chamber. On the whole, however, the survey reflects population proportions and there is no major “gap” in the responses.

Table 20: Survey responses in Gauteng

GP Chambers, merSETA database, SARS		Survey responses		
	GP Total	%	No	%
Auto	443	2%	45	11.2%
Metal	11974	60%	216	53.9%
Motor	5197	26%	90	22.4%
New Tyre	167	1%	5	1.3%
Plastics	2300	11%	45	11.2%
Grand Total	20081		401	

Source: merSETA survey of employers, 2018

There are limitations of the study that should be noted. The challenge of this research was always going to be its scope – the need to cover five chambers; to canvass employer, labour and provincial government stakeholders; and to offer insights into the informal sector (of which little is known). The methodology was designed to gather quantitative data that would be nuanced with qualitative findings. Larger companies with HR capacity were often more easily accessible than smaller companies – and usually had much more to report on training. Although the researchers were conscious of the need to balance out the voices of larger companies with SMMEs, this is a bias that is present in the data gathering process.

In order to verify that interview and survey data was correctly interpreted, findings were presented to stakeholders at the merSETA regional committee meetings of the northern Gauteng region (31.5.2017) and the Gauteng South Region (28.6.2018). There was overall agreement with the findings presented.

b. Gauteng Province industrial strategies

Gauteng is the industrial heartland of South Africa with manufacturing vying for policy attention with the mining industry, services and the financial sector. Nevertheless, Gauteng’s Department of Economic Development’s Strategic Plan (2014-2019) still points to growth in the manufacturing sector as an important means to deal with unemployment because it attracts semi and unskilled-labour (DED, Strategic Plan 2014-2019, p.13), though its contribution to employment stats and to the economy was declining.

Gauteng’s development plans are backed by commitments to support the development of township enterprises, cooperatives and SMME’s as well as to develop an “innovation-driven, knowledge-based, smart and green economy” (DED, Strategic Plan 2014-2019).

The Gauteng City Region Development Plan has prioritized Automotive and Components, as well as Plastics and Chemicals along with: Food and beverage; Furniture and Timber; Machinery and Equipment; Pharmaceuticals; Mining and Mineral Beneficiation and the Construction Sector. Tshwane is identified as an area for automotive growth while Ekurhuleni is seen to be a manufacturing catalyst. There is also a focus on increasing localisation especially of inputs into the automotive sector.

The Gauteng City Region Framework recognizes skills as a necessary enabler of its plans. It notes, however, that there has been “A lack of coordination and clear roles and accountabilities for implementation, monitoring and review” (p55). The skills planning function, therefore, has been relocated to report to the office of the Premier. This will allow for market driven skills planning through

its close position to the development and economic planning department. According to the plan: “The integral role of skills implies the Office of the Premier, in association with the Provincial Planning and Governance Cluster, should be the ultimate custodian of GCR skills planning, as well as a restructuring of the current Provincial Skills Development Forum to become the GCR Skills Forum (GSF).”

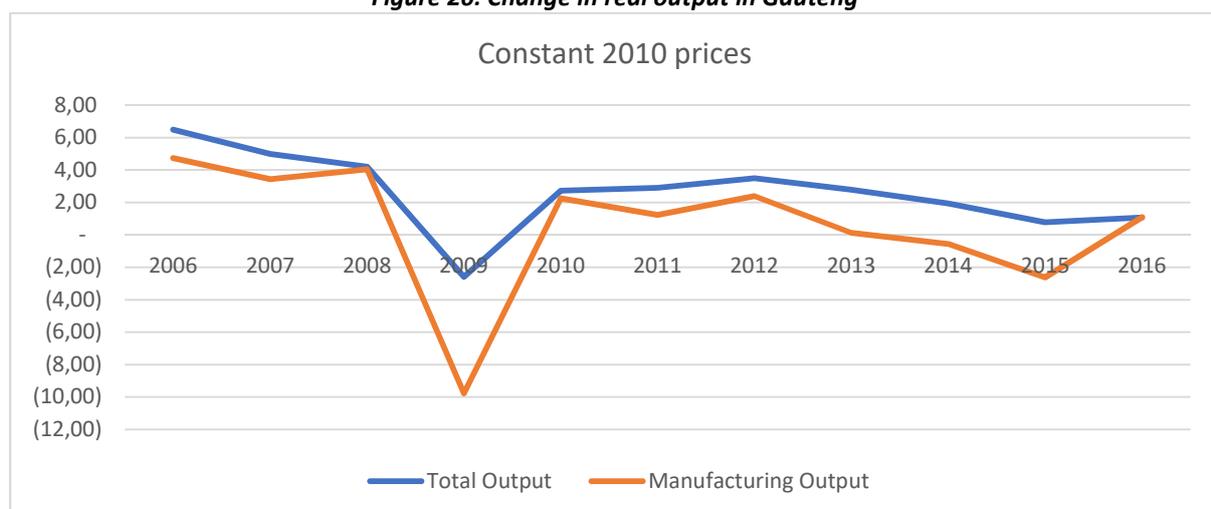
Institutional support services have been realigned to the location of the skills planning function. The idea is to clear up roles and responsibilities in provincial skills strategy development and implementation. The GCR Skills Forum (with executive capacity), a single consultative structure for skills planning and implementation, is meant to co-ordinate participation of key role players in the development of a provincial skills plan. Moreover, the skills strategy development methodology has been revised. The skills strategy for Gauteng will be developed, tested and adapted annually to ensure that interventions and outcomes are measurable and comparable. In sum, the Gauteng plan gives importance to the merSector, developments are structured around economic clusters and the significance of skills is raised by its location in the office of the premier.

c. The economic context of skills development

The nature of skills demand in the manufacturing industry can often be told in the visual representation of an economic graph. An economy that is on the up will usually lift the tide of employment and skills. An economy that is depressed will tend to discourage employment and training.

The graph below shows that while manufacturing output in Gauteng has been recovering since the recession of 2008 (and has come on par with total provincial output) it is still almost 5% off from pre-recession figures. The manufacturing sector has seen its contribution to the GDP declining from 17.4% in 2006 to 13.5% in 2011. (REB Provincial Review 2016). Nevertheless, manufacturing still dominates the real economy of the province, providing 14% of total provincial output, followed by construction at 3%, mining at 2%, and agriculture at under 0,5%. Gauteng contributed 40% of national manufacturing (REB Provincial Review, 2016).

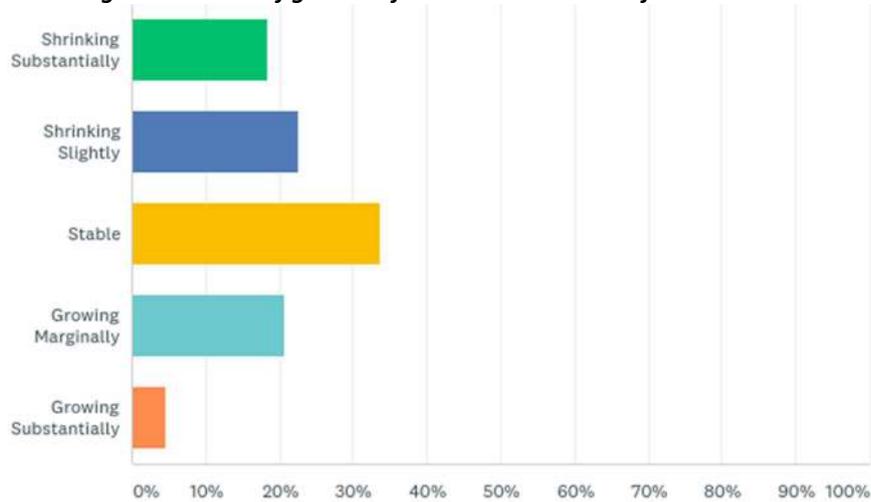
Figure 26: Change in real output in Gauteng



Source: Stats SA, 2017

In the survey conducted with employers for this study, 40% (of 305 responses) of businesses reported that they were shrinking and 25% showed growth. In addition, 26% said they were undergoing substantial changes.

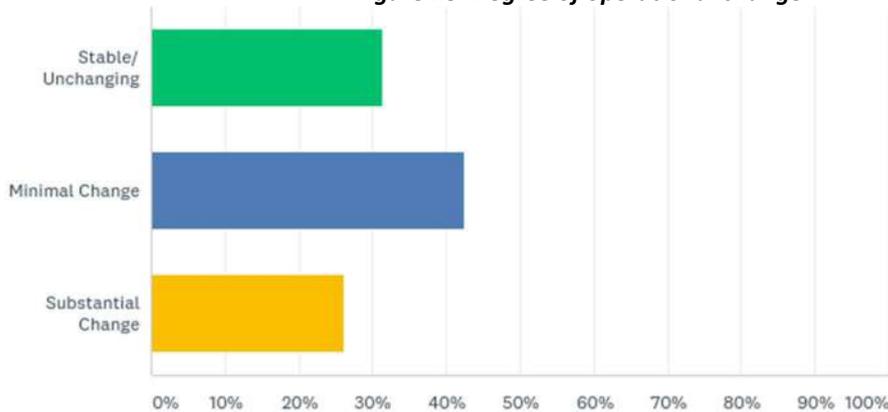
Figure 27: State of growth of businesses in terms of revenue



Source: merSETA survey of employers, 2018

The economic slowdown has had an impact on the number of firms operating in the merSector. Details on the economic conditions affecting metals, automotive & motor and plastics chambers are detailed below

Figure 28: Degree of operational change



Metals

Metals manufacturing has struggled. Large companies, such as MacSteel, have closed branches. Aveng Trident Steel gave notice to Numsa of 733 lay-offs late in 2017 (Malebo). In 2017, Arcelor Mittal closed unprofitable plants and went into a Section 189 process – though instead of retrenching people they were moved into other production areas. All external recruitment was stopped (TH).

The increasing input cost of materials (especially after Arcelor Mittal approached the dti for customs protection from imports from Asia), the escalating price of electricity and fuel and external competition (mainly from China) appears to have decimated smaller metals manufacturers. The small machine shops, backyard facilities, in the Ekurhuleni area are all but disappearing because demand for their products is vanishing.

The small to medium-sized employers spoken to were mainly involved in 'jobbing' – that is producing individual bespoke items mainly to the mining industry. Their businesses were sensitive to international competition (specifically from China) and lack of investment in the local mining industry. When gold mines in South Africa spiralled downward, many of the metal companies turned for work in mines opening up in Africa mainly in the DRC, Guinea, Sierra Leone, Ghana. One interviewee explained that: "people who don't have exposure to end-users working outside the country are in a precarious situation – they can't really make it" (MS). "The top-tier – Anglo-Gold Ashanti, Billiton – decide on development and we pursue one another's Greenfields projects. You do work not where people are looking to up production, but to patch something because its leaking or not performing. Those guys on a decent sized mine are committing R1.5 – R3 billion and if you get a fraction of 1% you're doing nicely" (MS).

As the industry slips downward, so skilled people take flight and pursue greener pastures, leaving the industry with even less capacity to recover. One interviewee vividly described the situation: "We are just a little boat on a stormy night trying to cross the ice" (MS).

While political uncertainty and lack of confidence was argued to be dissuading investment, spikes in commodity prices were seen to potentially drum up sufficient demand to open up mines and new shafts. One metals company was optimistic that after eight years of losses, they had started to see a turn around and with contracts signed with Transnet and Eskom, were expecting to buy two extra laser machines that would in turn require additional maintenance and operational personnel.

Automotive & Motor

Automotive is doing well in comparison to metals. Gauteng has the largest concentration of automotive manufacturing in the country. Roughly 40% of national component manufacturing is located in the province. Gauteng accounts for 39% of all vehicles produced in the country, 35.5% of new car sales, 31.2% of light commercial sales, 36% of truck sales and 43.2% of vehicle exports ([Nicole Crampton](#), 26 February 2017, Key factors that drive South Africa's automotive manufacturing industry, Standard Bank, BizConnect).

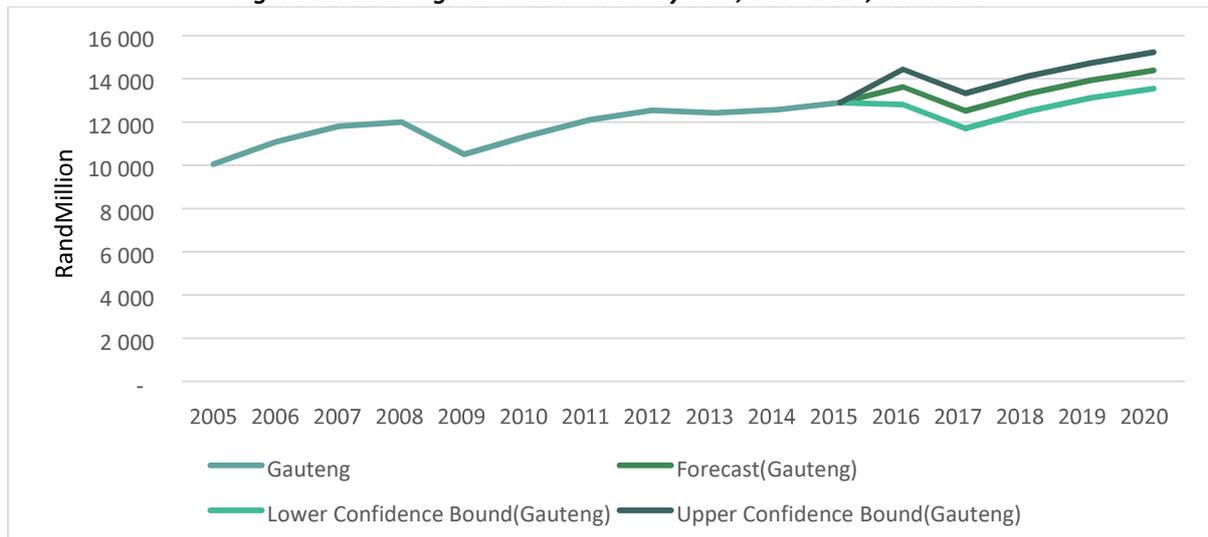
According to a report published by the AIDC, Gauteng's Automotive GVA CAGR between 2005 and 2015 was 2.5%. This was lower than Mpumalanga (3.8%), the Western Cape (3.7%), Limpopo (3.5%) and KwaZulu Natal (2.9%). According to the AIDC report: "this most likely means that it is producing near capacity as it is the country's major manufacturer. Regardless of the less substantial growth,

Gauteng remains the auto industry capital, in terms of production, gross domestic product (GDP),

sales, as well as job provision” (AIDC Economic Impact Assessment 2015/16 Financial Year Report

Prepared by: Urban-Econ Development Economists, p49). The graph below, taken from the same report, shows the dip during the recession and the general upward trend since then.

Figure 29: Gauteng Automotive Industry GVA, 2015-2020, R millions



Source: Quantec Easy Data (2016); Urban-Econ Calculations (2016).

Although Nissan have over the years downscaled and no longer manufacture cars (they now assemble only bakkies), production of the Nissan Navara for local and export market is expected to boost business substantially. Indeed, they reported complaints from staff that they are working too much overtime.

Nevertheless, there were companies feeding into the automotive assembling process that were less buoyant than the OEMs. Increasing cost of labour in proportion to productivity was raised as an important factor in the closure of a Gauteng factory producing leather car seats in 2018. Almost 550 staff were retrenched after a major car manufacturer awarded its contract for seats to a supplier in Mexico on the basis of price. The major cost drivers had been the logistical distance from customers in Europe and inflationary pressures on the cost of labour. As the production manager put it: “labour is not cheap anymore” (L). Until 2012, the MIDP had offered a cushion – in terms of subsidising logistical / transport costs – but when that fell away, the competitive pressures have pushed the remaining seat manufacturers towards closure. The impact has been felt by the tanneries too - in a space of 12 years, four tanneries supplying five plants were felled down to two tanneries supplying just one plant.

In motor, Dr Azar Jammine, director and chief economist at Econometrix, is quoted as saying that although the decline in new vehicle sales in recent years affected retail sellers negatively, it would provide a boost for the after-sales market as buyers would keep their vehicles for longer. This means

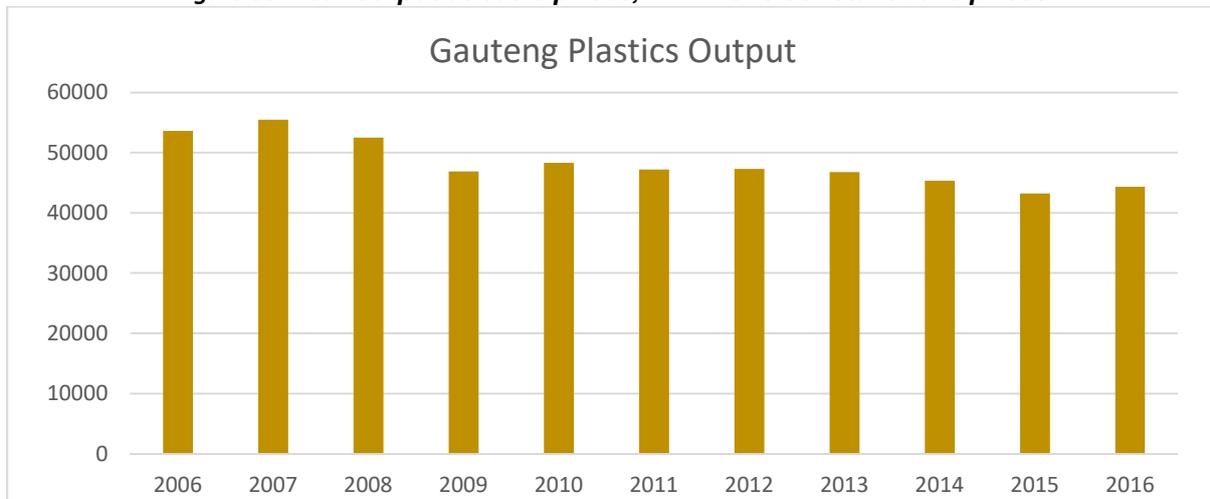
additional maintenance and servicing (https://www.wheels24.co.za/News/SA_vehicle_sales/5-things-you-should-know-about-the-sa-car-industry-20170705).

At the same time, Pieter Niemand, director of the Motor Industry Workshop Association (MIWA) points out that service intervals for new models had become much longer impacting on the level of business to be had from workshops (Motor Industry Workshop Association appoints new director, July 2017, <http://www.bizcommunity.com/Article/196/454/165246.html>).

Plastics

The plastics sector has experienced consistent negative growth in real output between 2006 and 2016. In 2006, the sector contributed 0.7% to the country's total output and this reduced to 0.4% in 2016. According to CCRED_CoJ performance of the plastics sector has been poor and sector output has declined from 2007. "In actual fact, plastic products would be expected to grow more rapidly than GDP and more than upstream sectors in a diversified industrialising economy. Three industries in particular – construction, packaging, and automotive – drive growth of the plastics sector as economies grow, but in South Africa's case, though the industries have been growing, this has not translated into growth for the plastics sector" (CCRED_CoJ, p7).

Figure 30: Real Output at basic prices, R millions constant 2010 prices



Source: Quantec, 2017

d. Changes in employment and skills

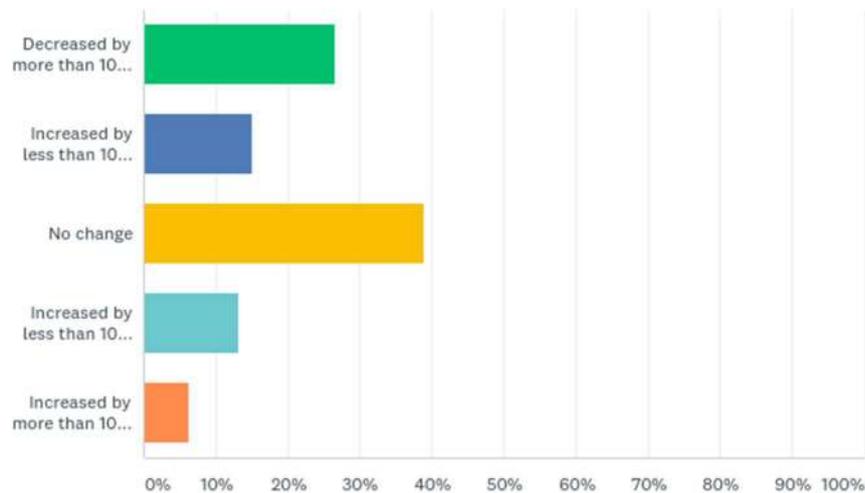
In the economic context sketched above, 26% of industries stated they were growing but as many as 40% claimed to be shrinking in revenue. In attempting to improve productivity, firms can try change the composition of their workforce – either hiring higher skilled individuals or employing lower-skilled individuals (and so saving on the wage bill).

This section reports on how interviewees have adjusted their workforce over recent times and then lists the kinds of skills stated in the survey as being scarce.

The first point to note is that, overall, it's clear that employment has come down.

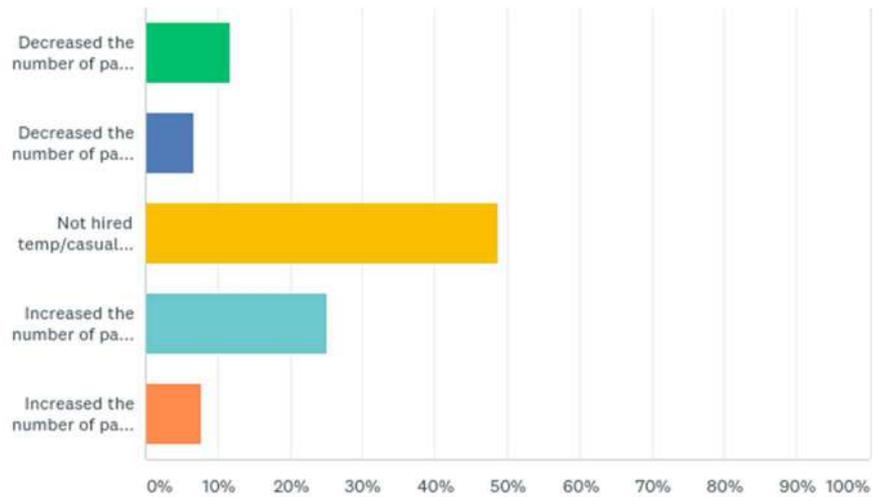
Our survey of employers showed that 19% of respondents had increased the size of their workforce, 39% reported no change and 41% said employment numbers had decreased.

Figure 31: Change in the number of full-time employees in businesses in Gauteng



Interestingly, 32% of companies reported increasing the number of part-time employees. This has important implications for skills development. Employers are less likely to want to invest in skills for casual labour or may only concentrate on elemental training (for the immediate job at hand) which does not contribute to holistic development of people. The flipside, if casual or part-time labour have periods of down-time (waiting to be re-employed for the next contract), then there is a possibility to engage them in extensive skills development (full learnerships, artisan training, etc). However, technically as “unemployed” workers, such learning processes would be coupled with a stipend which has a very direct impact on SETA discretionary funds and budgets.

Figure 32: Employment of part-time or casual employees

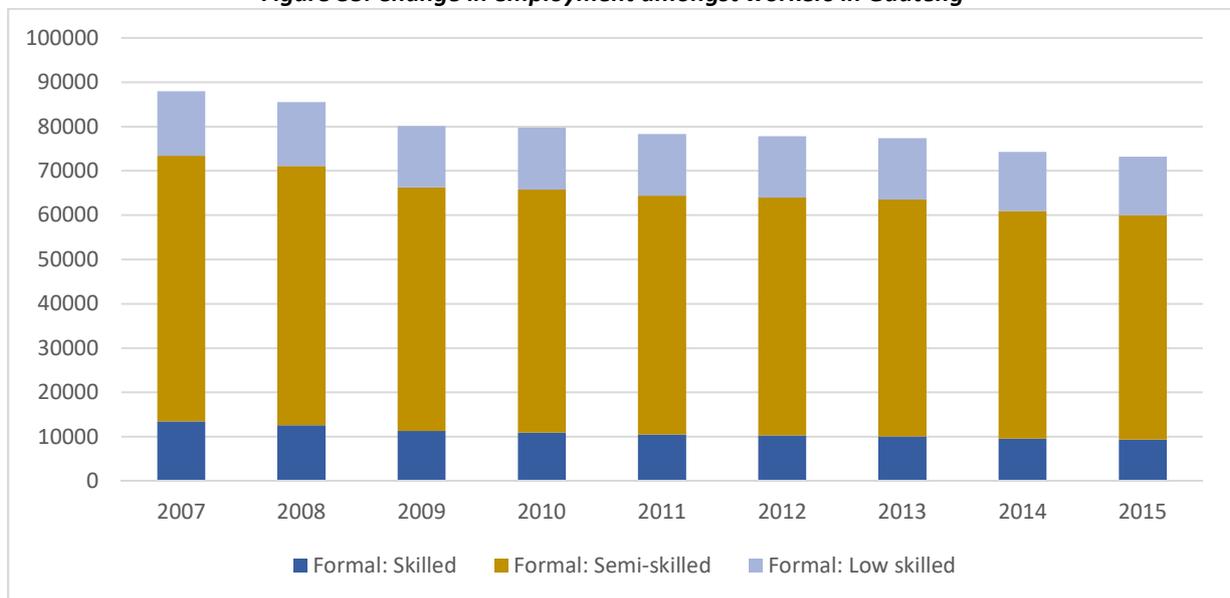


More detail on shifting employment patterns in each chamber is described below.

The metals sector

The graph below shows decreasing numbers in employment and it appears that semi-skilled work has been hardest hit.

Figure 33: Change in employment amongst workers in Gauteng



Source: Quantec

Table 21: Numbers of employees in the formal sector, skilled, semi-skilled and low-skilled, 2007-2015, Gauteng Province

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Formal: Skilled	13465	12608	11342	10975	10548	10276	10083	9590	9367
Formal: Semi-skilled	59950	58520	54968	54827	53845	53671	53461	51352	50670
Formal: Low skilled	14552	14414	13784	13973	13893	13893	13858	13324	13170

As employment in the formal sector has dropped (from just under 80,000 in 2010 to just over 73,000 in 2015), employment in the informal sector has remained more steady at around 19,000.

Table 22: Numbers of employees in the formal and informal sectors, 2007-2015, Gauteng Province

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total	101912	99282	94744	95435	94399	91749	93778	89338	88990
Formal	87967	85542	80094	79775	78286	77840	77402	74266	73207
Informal	13945	13740	14650	19827	20178	17942	20255	18840	19506

Source: Quantec

The metals sector provided the clearest evidence of companies downsizing their workforce and relying on lower-skilled workers. One employer (T) said they simply could not afford skilled labour at this point and their unskilled workers were all multi-tasking. The small employers were often able to do this since they were producing products that were simple fold-and-weld.

Even the medium-sized companies appeared to employ proportionately more semi-skilled labour. A stainless steel factory, for example, said that in fabrication (where they contracted in employees on a needs basis), 40% will be qualified artisans. In the day-to-day operational side of cutting steel, the company employed only two skilled artisans to oversee 70 shop floor operators.

The shift to a lower-skilled workforce was only partly because of costs. Other reasons included not finding suitably qualified individuals. Despite owning a metals company that assembled large-scale equipment for mines (such as conveyor-systems), an interviewee said he knew just one welder in the past 15 years who had a trade qualification (his employees were coded welders or had learnt the skills on-the-job but had no certification).

Employers spoke of inherently dangerous and tough working conditions for welders and boilermakers which deterred young people from entering the trade. “Boilermakers,” explained one interviewee, “live in an environment where they are either too hot or too cold. They are on their feet all day. They work a standard 40 hour week” (MS). “I don’t remember the last time I’ve seen a decent boilermaker under the age of 45. They just don’t exist. I think a lot of people when they see the business, think they can do a lot better behind a desk” (MS). Another employer also noted a scarcity in boilermakers: “My youngest boilermaker is 58 and the oldest is 73. There are no young boilermakers coming through. I’ve just brought back one of my welders – he’s 64 – to train the young guys.”

A niche, scarce skill mentioned by only one workplace (a large employer) was that of refractory masons who relined the furnaces with fire-resistant bricks. It’s a skilled, precision trade but working conditions are incredibly difficult.

There was generally less investment in advanced technology than might be expected. Metals factories have rarely upgraded their machines in the last 20 years and so in the short to medium term this did not displace labour. To cover the costs of an imported CNC, laser-cutting machine, would require the machine to run 24 hours a day. In the metals industry where contracts were scarce and companies were relying on manufacturing once-off products, an old-style guillotine would often make do – or metal-sheet cutting would be outsourced.

The stainless steel cutting company said CAD skills are sufficient at operational level and that artisans still need to be able to operate a standard drill and saw and old lathe. Moreover, the new digital technologies did not create many new jobs. Even in a (successful) medium-sized metals company that was running on more up-to-date CNC machinery (imported from Italy), there was only one full-time IT expert. A very large employer admitted that their equipment was outdated and artisans returning to work after attending training courses were faced with the challenge of adjusting their new skills to old components (Rotec).

Arcelor Mittal also explained that: “A lot of our processes, because they are so old, are labour intensive. Now we have a continual drive to improve productivity. ... if we put in this new equipment, it can get rid of people and therefore productivity goes up – but it costs millions of rand. We don’t financially have the money to do that right now ... We push automation but within the confines of budget – if you don’t have CAPEX, you don’t have CAPEX.” But there was anticipation that as the costs of automation and computing were dropping, so even smaller companies would be investing in machines. As one employer explained: “Now we need an operator to listen for when a cutting tip breaks. We just bought a lathe that doesn’t need an operator at all. It has a probe that will measure the job. The only time it will stop is if a part doesn’t measure right.” Boiler making was said to be another job where computer technology was contributing to deskilling. “So we can use semi-skilled labour. Joins can’t go wrong. We just feed the drawing file into the machine.”

One of the consequences of employing unskilled people was that quality of workmanship was a problem. “We have major problems with scrapped work,” said one interviewee (T). Inadequate literacy and numeracy skills were mentioned as a problem that could have expensive consequences. As an example, numbers scored into the metal the wrong way round were difficult to correct (MS).

A positive outcome was that employees were being trained (though usually informally). One medium sized metals employer explains: “I spend a lot of time outside and with a lot of repetition and there’s no such thing as a bad question. A lot of it is developed on fancy software – produces an enormous amount of paperwork and is extremely confusing. And if people come in and are not completely at ease with reading and writing – just come here and we’ll talk about it over again – at the end of the day it’s a confidence issue” (MS). In the survey of employers for the metals industry, the following skills rose to the top as most in demand:

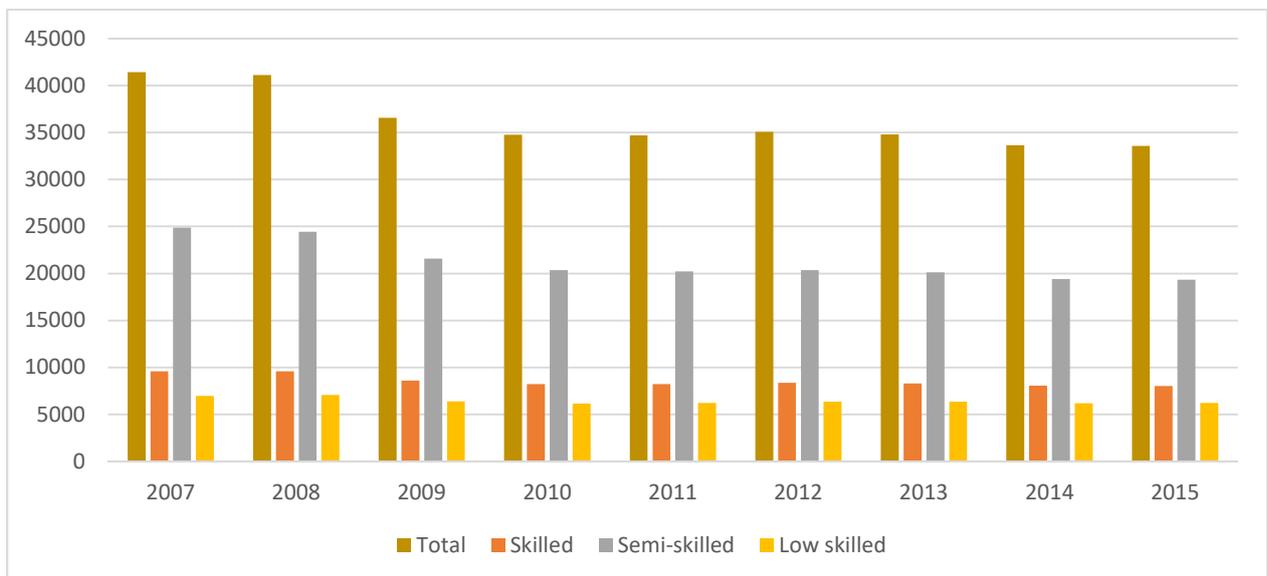
Table 23: Skills in demand within the metals industry

Welder	22.00%	44
Fitter and Turner	17.50%	35
Boilermaker	16.00%	32
Production / Operations Manager (Manufacturing)	13.50%	27
Quality Manager	10.50%	21
Millwright	9.50%	19

Automotive & Motor Chambers

In the automotive chamber (Motor vehicles, parts and accessories), employment numbers dropped sharply after 2008 (the year of the global recession). They have remained fairly consistent since then, though, again, its semi-skilled workers that have seen the biggest declines.

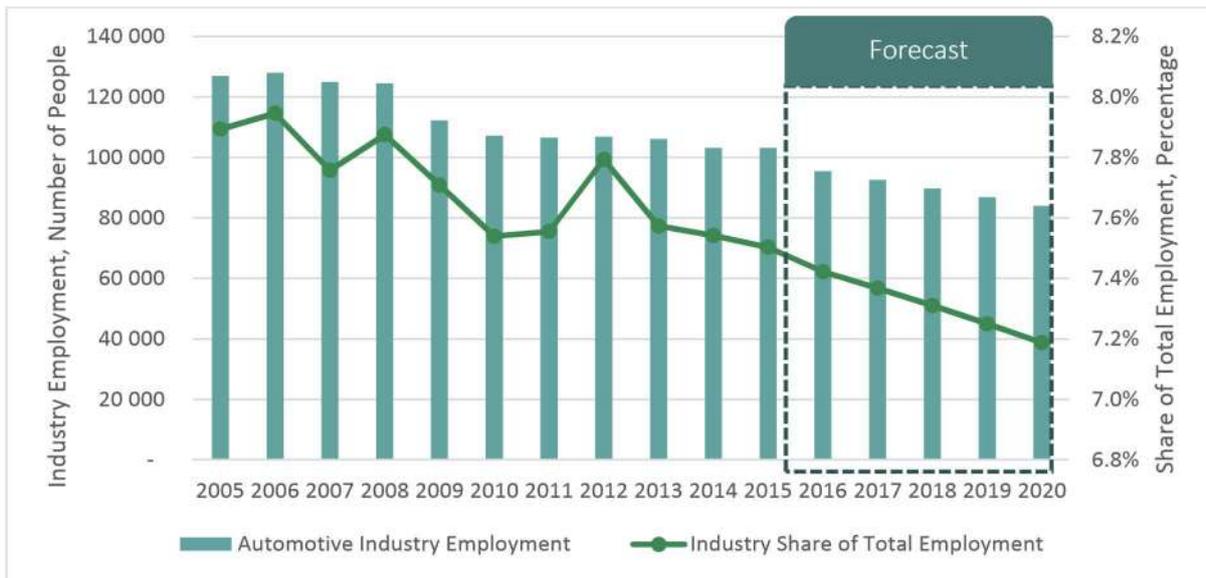
Figure 34: Formal employment in GP: Motor vehicles, parts and accessories [QSIC 381-383]



Source: Quantec

The graph below taken from an AIDC Economic Impact report shows the same decline, though their employment numbers are slightly higher (which may be because it includes SIC codes 631-634, 361-363, 365-366 Sales, Maintenance and Repair of Motor Vehicles).

Figure 35: South Africa Automotive Industry Employment, 2005-2020, Number of People



Source: Quantec Easy Data (2016); Urban-Econ Calculations (2016).

In the automotive chamber, where business was generally healthy and there had been rapid adoption of new technologies (driven by OEMs and an export market), the demand was for more highly skilled workers – technicians rather than artisans (according to interviewees). BMW, for example, had structure career pathways to move artisans into becoming engineers. Nissan had retrenched their low-skilled staff and discontinued all ABET programmes. A shop steward at UD Trucks speculated that there were less than 3% of workers (mainly older workers) who illiterate.

A Numsa shop steward, however, noted that one of their biggest challenges in the auto manufacturing sector was rapid layoffs because the industry’s economy fluctuates frequently. Employers respond quickly to economy, offering packages for older workers or going into ‘short-time’ that can result in 50% cut in pay. Although the LIFO principle usually a factor in who is retrenched, employers do try to retain those they have trained.

Here Toolmakers were mentioned as in high demand and very expensive (paid at graduate salaries) (with a new toolmaking diploma TDM to grow numbers) (N). Mechatronics was also noted as a major problem for assemblers but for which there was no qualification or trade test in place (N). Other skills mentioned were maintenance (millwright) and diesel mechanics (UD Trucks).

New processes or material could also create demand for certain skills. In automotive, for example, a range of new materials and “joining technologies” (BMW interview) had created new demand for welders / panel beating. The costs of replacing parts of damaged vehicles had also over-priced the costs of repairing vehicles, pushing up the demand for panel beaters. The employer survey highlighted the following scarce skills in the automotive sector:

Table 24: Occupations in demand in the automotive sector

Electrician / Automotive Electrician	15.91%	7
Millwright	13.64%	6
Spray Painter	13.64%	6
Mechanical Engineer	13.64%	6

Mechatronic Engineer	13.64%	6
Quality Manager	18.18%	8

In the motor chamber, changes in technology to improve fuel efficiency and emission controls and the use of turbochargers and superchargers have made new demands on technician’s skills. There’s also the requirement that technicians be qualified in order for service centres to be allowed to take on work from insurers. The formal after-market sector, therefore, is generally locked into higher skills. Nevertheless, even here there may be attempts by employers to expand the work of employees. One of the trade unions organising in the motor chamber (MISA) reported that they were having to deal with an increasing load of disciplinary cases over job performance – either because a person lacked skills or the job specification was not clear. It was observed that: “Employers are allowing (because of shortage of skilled employees) for apprentices to work unsupervised”. Retrenchments had also meant that remaining workers had to take up the slack and were having to upskill but often at the same salary level. The TU reported that especially older workers were resisting these changes to working conditions. The employer survey picked up on the following scarce skills in motor.

Table 25: Occupations in demand in the motor sector

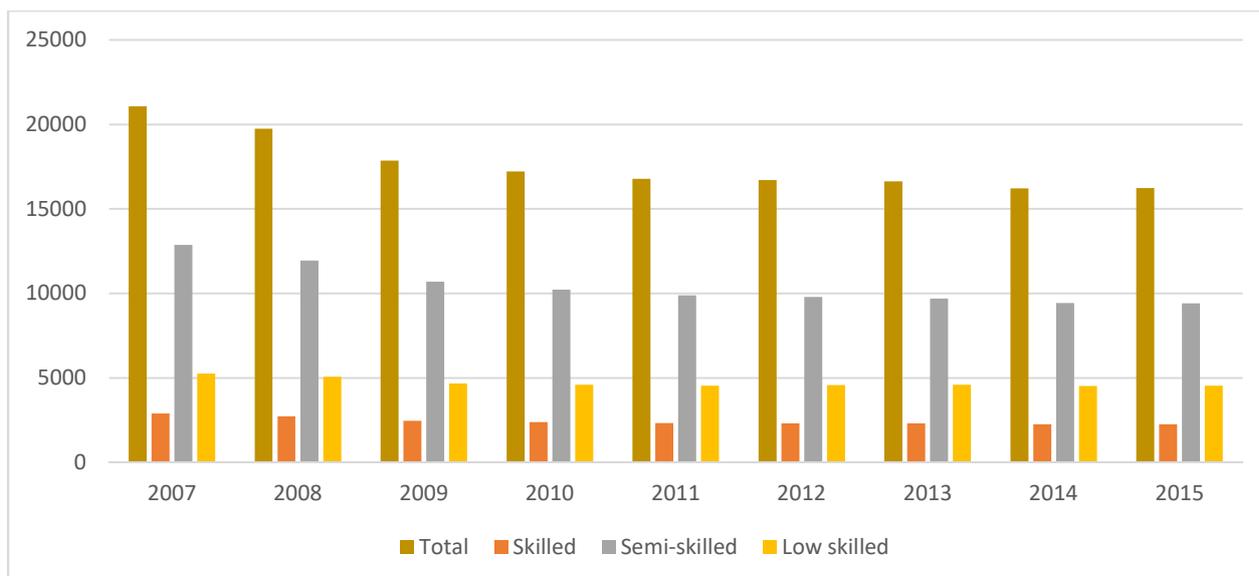
Spray Painter	21.35%	19
Auto body repairer	20.22%	18
Motor Mechanic	16.85%	15
Diesel Mechanic (including Diesel Fuel Injection Pump Mechanic)	16.85%	13
Salesperson with technical product knowledge	13.48%	12
Automotive Electrician	12.36%	11

Plastics

Gauteng contributes as much as 48% of plastics manufacturing in the country. Currently, the plastics industry is under pressure with companies closing down, retrenching people and downsizing (AH). According to an industry association representative, during the 2000s, the industry lost people who had both technical and management skills as well as toolmakers (most probably to emigration). With this missing layer of skills, he says: “The result is that often you get so thinly sliced that you get people that are involved in the lower level jobs that do not have the right skills” (AH). Moreover, there are missed opportunities to innovate and link into export markets in Africa. The SMMEs visited mainly employed people as machine operators reproducing widgets – not requiring much in terms of skills.

The graph below shows that employment in plastics has dropped since 2007 – pulled down mainly by the decline in semi-skilled labour.

Figure 36: Plastics employment by skills level - Gauteng



Source: Quantec

In a survey conducted in Gauteng in which 29 plastics firms responded, 16 indicated that they struggle to find people with the required skills, albeit to different degrees. Most of those said they hire people without skills and train them. 22 of the 29 plastics firms provide training to their employees and 19 of the 22 provide the training in-house. In the employer survey the following scarce skills were mentioned (only the top 6 reported on):

Figure 37: Occupations in demand in the Plastics industry

Tool, Jig and Die Maker	20.00%	8
Plastics Production Machine Operator	17.50%	7
Quality Managers	15.00%	6
Plastics Manufacturing Machine Setter	15.00%	6
Millwright	12.50%	5
Machine Tool Setter	12.50%	5

Interestingly, plastics engineering is not mentioned in the list. Yet skills in design and 3D printing technology is assumed to be cutting edge in terms of changing the way that production of high performance plastics products are manufactured, allowing firms to develop and launch a range of products faster, at lower costs and with fewer risks (Centre for Competition Regulation and Economic Development, 2016).

In sum, there are a number of general observations made about scarce skills in interviews that are worth noting:

Firstly, there were differing points made over what criteria should be used for a skill to make it onto the scarce skills list. Should demand be driven by the accumulated number of persons reported by industries in their WSPs or should relative weight be given to persons who may be needed in fewer numbers, but who would have a bigger impact on production?

- An interviewee in the plastics chamber argued that because of the industry's smaller size compared with the other chambers, their skills needs were often left off the scarce skills list. He explains that: "we had an argument about that because they look at the skill with the highest number that they need to train and that becomes the priority skill and we have agreed that you need to do it per sector."
- A manager at Arcelor Mittal argued: "I am not convinced that we have such a need for artisans as much as we say we do. It's is a political agenda, apparently addressing youth needs in South Africa."
- There was general agreement, though, that the supply of skills was not following on demand.

Second, an area of skills mentioned that was sometimes vaguely defined was that of "soft-skills" – particularly for managing or supervising a team. Explains one interviewee: "because of the way the world is changing, we need to look at more people with multiple skills, also with leadership qualities. But also, skills where people can work in multiple projects and are able to work with diverse groups, at various times or at the same time" (BMW).

- Production managers or supply and distribution managers were not directly mentioned by interviewees (except, perhaps, in terms of soft-skills such as needing "group leaders (supervisory) and warehouse learnership" (UD)). One interviewee did however point out that their international competitors had outperformed them (in part) through improving efficiency. He explains: "for skills development they [the international companies] have an in-house method ... the efficiency of the workers is not only to handle a machine but to be able to consistently produce the same volume at the same quality level all the time. It's to extend a basic understanding of the business and the impact of labour – if you wait on the material, it's an expense to the company which is not recovered – to understand the principles of manufacturing and avoidance of waste" (L). Interestingly, he points out that technical skills are not in short supply. Indeed, because companies are currently retrenching, skills are readily available. The bigger challenge was to "apply skills at a rate that is competitive" (L).

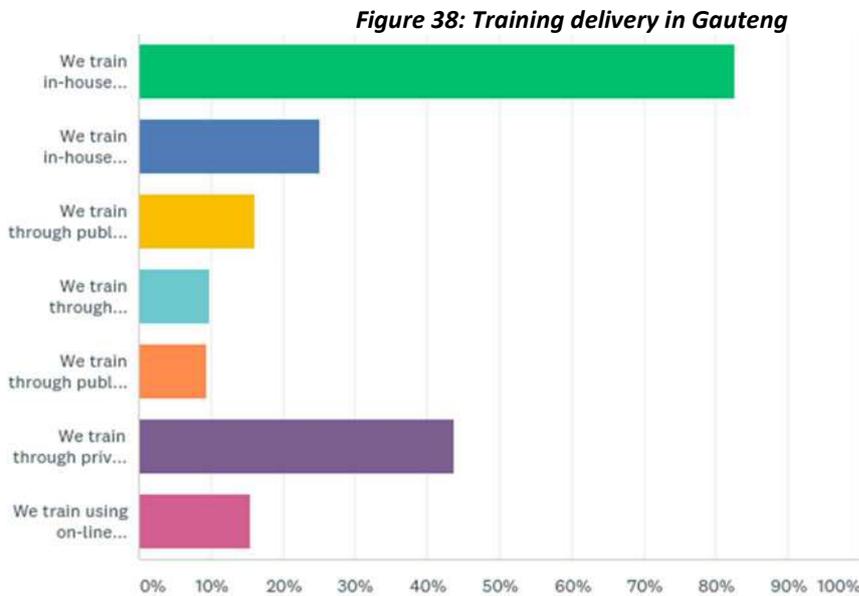
Third, while some occupations were highlighted and there were broad areas of skills identified, in the main the list remains quite small. Even amongst the biggest employers in the province, there was circumspection over precisely what their scarce skills were or would be in future.

- The HR manager of a large employer, for example, when asked about scarce skills said: "Besides the turbine engineers, I'm not really sure" (RT).
- Engineering was identified as a scarce skill – but it often came with the rider that there were enough people with qualifications and not enough with experience and exposure to the industry.

e. Skills supply

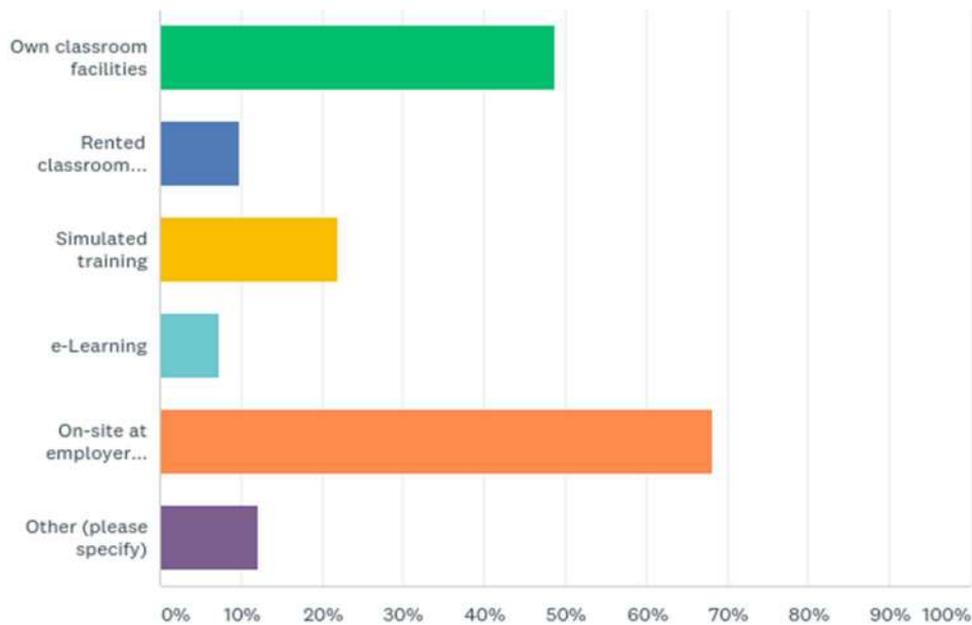
The main findings so far in this report show that employers, under economic pressure, seem to be letting go of semi-skilled labour and staying with higher proportions of low-skilled workers. (Automotive is the exception to this since technology is driving higher skilled in this chamber). This section reports on the training activities employers are engaged in to respond to the changing skills levels in their workforce.

It's immediately clear from the graph below that employers state that in-house training is their dominant approach to skilling. Private providers are the next most popular means of training – almost 44% of 298 respondents. The education provided by universities and universities of technology was the least form of training used by employers.



About 49% indicated that there are sufficient accredited training providers close to their business operations, whilst 20% indicated a lack of training providers close to their operations. The employers who indicated who indicated difficulty with finding accredited training providers close to their operations noted the cost and productivity implications of sending employees to train in faraway locations. Just over 20% of employers in the survey did not know whether there were accredited training providers close to their premises. Surprisingly (given Gauteng's urban nature), as many as 30% of employers were not aware whether there were sufficient training providers in their area. The survey of private training providers revealed that most (68%) delivered training at the site of employers.

Figure 39: Training delivery modes



Arcelor Mittal has 1500 people in its development pipeline currently (2017/2018), enough to replenish its turn-over. According to the HR manager, they “prefer branded (in-house trained) people.” Currently, in the development programme there are:

- Over 700 artisans (electricians, millwrights, instrumentation, fitter-and-turner, welders, boilermakers, rigging).
- over 100 engineers at university.
- 40 – 50 technicians at universities of technology.

In addition, they have a large number of learners being trained in the production processes.

The development pipeline provides support to learners from school (they offer maths, science, English and computer studies at after school centres) to university, technicians, apprentices or production learners: “we call it the cradle to the grave”.

An Accelerated Artisan Programme condensed the 4-year experiential training period into 18 months (though they now comply with the QCTO’s three-year programme). It includes 54 weeks on the job training in the plant and the institutional training. Apprentices do specialised courses, advanced courses, professional skills and they work in a maintenance pool, under mentors, so they get a vast experience in different areas. Engineers go through a two-year candidate programme

The HR manager explains that: “There’s no reward for it – it costs us money – but our point of view is that the apprentice becomes productive at neutral cost to the company in 2.5 years – so there’s value add to the company based on their salary and input costs. So in that phase, we pay them higher than a learner and less than an artisan because they’re in a training programme but they start to add a profit to the bottom-line.”

Other metals companies that used to have large training schools, have closed them down – such as Skaw, Consol, McKenlie Bros (MS). One interviewee said: “I think there’s no incentive to train them [artisans]. SDL is used as another form of taxation. ... But we have some young guys here that show promise and at my expense, I have sent them to school” (MS). In another medium-sized metals

company, of the 100 workers, only 12 were qualified artisans. The owner said most of his semi-skilled staff had been trained up from unskilled tasks (cleaners and grinders) into taking on more responsibilities. “As soon as they qualified, they go work in the mines – they steal them from you. So that’s why we don’t qualify them – we keep them as semi-skilled. They get skilled salaries,” he explains. The only formal training offered is for machinists who attend CNC training as technology gets upgraded (usually a nine-day course – 3 days over 3 sessions).

Employers in the metals sector admitted that training was one of the first budget items to be cut when business was in decline. If metals companies were training up their own artisan skills, the automotive companies were looking for certified artisans. Once employed, they are streamed into continuous development programmes and supported through bursaries for further study. But getting into the automotive sector was extremely competitive. One assembly plant (BMW) reported that of they received 4000 to 5000 CV’s for 30 apprenticeship positions. Another (UD Trucks) had only about 50 apprentices in their national intake at any point in time.

All the automotive assembly companies had training centres. Generalised training was not considered to be sufficient to handle the specifics of an auto product. At BMW, for example, the prediction was that there would in future be a greater need for technicians, engineering students and software developers. But the precise nature of those skills was dependent on the direction given by the parent company in Germany. “The problem is that it has to be BMW specific skills ... For instance, the robots we use are BMW specific. The way they use it and the systems that they use are unique to BMW. So, we can’t get a guy from Nissan for example. He won’t be able to use them.”

Similarly, although the anticipation was for hybrid and electric cars to flood the market in the next ten years, it was unlikely that the training would be local. According to one respondent, although currently there are just two people certified to work on high voltage electric cars: “even guys who have been working here for 20 or 25 years won’t be able to work with them or even to touch them.” BMW apparently does not recognise local electrical qualifications. When electric vehicles are assembled here, the engineers and technicians will need to do their training in Germany.

UD have a Competency Development Centre headed by a training manager, though they also rely on external providers to deliver training. New entrants for diesel mechanics and millwrights are trained by private providers and then placed in a training workshop before gaining work exposure. In addition to the OEM training centres, since 2000, the Gauteng Province has provided specific institutional support to the automotive sector with the establishment of the Automotive Industry Development Centre (AIDC). The main focus of the AIDC is to support skills development and training in the automotive sector, as well as to facilitate investment, ensure development of the automotive supply chain, encourage enterprise development and incubation programmes.

The AIDC is working closely with TVET colleges in Gauteng, helping to place students in the automotive sector for the practical components of their qualifications (autotronics, mechatronics, welding, motor mechanic, diesel and petrol, auto body repair, boiler making, auto electrician), as well as supporting lecturer training. The AIDC also has a plan to open its workshops to TVET lecturers and students to gain some practical experience and to handle the tools of their trades. Courses offered include health and safety, role of a supervisor, quality tools and visual management, automotive components and manufacturing assembly and dealership network training. The plan is to have up to 250 learners / week (in groups of 15 students). The AIDC (which is accredited with the international Institute of

Motor Industry) has recently earned its stripes as Trade Test Centre and plans to offer an RPL service through NAMB. The OEMs (BMW, TATA, Iveco, Ford and Nissan) have provided support particularly donating equipment.

There's also been a focus on SMMEs in various townships, with assistance being provided to identify skills gaps and advise on the level of training needed. One of their training sites is the Winterveld Enterprise Hub: Automotive (WEH). Winterveld has always had a strong, yet largely informal, automotive presence. The purpose of the hub is to expose the local SMME's to modern auto body repair equipment and methodology and to formalise and develop their businesses by facilitating economic transformation within this area. Artisans receive mentoring and training from Master Artisans located at the facility. Training is a combination of practical learning in spray painting and body repair, as well as business mentoring. The aim is to develop Township enterprises. The project will continue to focus on body repair work (with increased levels of government vehicles anticipated) as well as providing training and mentoring into the 2016/17 year. Business management training will be done in collaboration with educational institutions (e.g. UNISA).

The AIDC's Automotive Incubation Centre at Ford Motor Company South Africa (FMCSA) provides training and business support to BEE SMME start-ups in the automotive industry. Aimed at BBBEE companies entering the automotive industry (with the incubatees being the business owners), the project assists them to overcome the high barriers to entry and become successful participants and contributors to the industry.

Trade Union Solidarity established its own training centre in Pretoria, Saltech, 10 years ago. The centre is intended to provide training opportunities for apprentices that were lost after the State-owned Enterprises scaled down their training centres. Saltech was also set up in response to the growth of training for profit. Explains the Solidarity rep: "Training should not be about money." Although students pay for the training, it is subsidised by union dues – of the R130 membership fee, R10 goes towards the training centre. "You get the grants from the SETA but it does not pay for capital investment." A final motivation for setting up Saltech was the need for training in Afrikaans as first-language. Saltech currently trains up to 1000 apprentices in seven trades and helps with job placements. They are looking at introducing newer trades such as mechatronics.

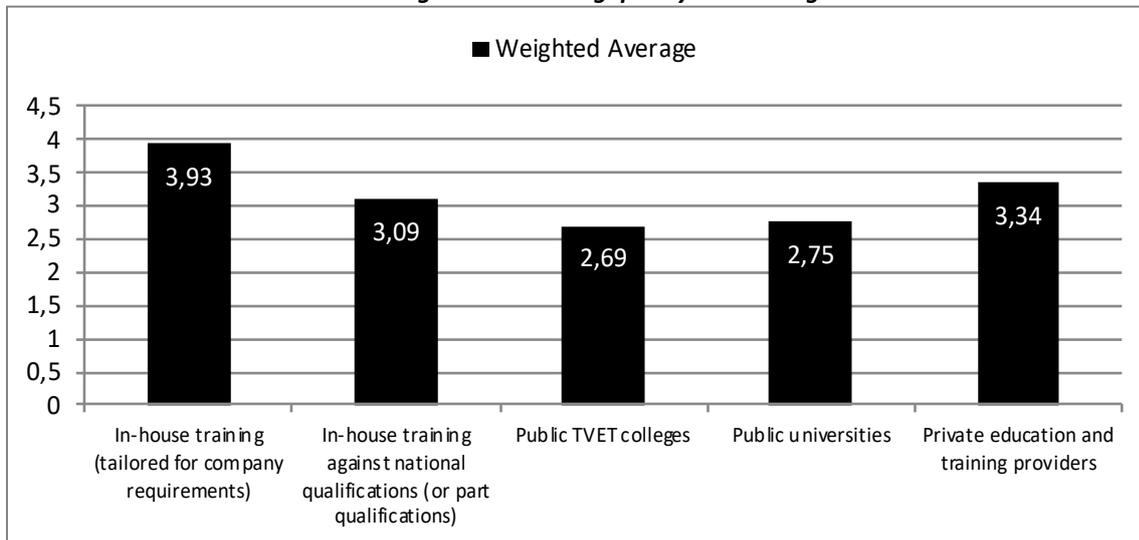
According to SIEFSA representative, while the SETA was "doing very little for the steel and engineering manufacturing sector", the automotive sector has successfully lobbied merSETA for resources (PC). The statistics, however, show that although the Motor and Metal subsectors do not train the largest proportion of workers, they provide more training per trainee than the other subsectors (Bhorat and Naidoo, p14).

Plastics SA has a training centre in Midrand which trained 1676 learners in 2015/6 (Plastics SA Annual Report) (3352 training nationally by Plastics SA). Amongst its training programmes, the following were customised: Pipe Extrusion (NQF Level 4); Settings for Injection Stretch Blow Moulding (NQF Level 4); Use Fabrication Tools and Equipment (Component of Polymer Composite Fabrication NQF Level 2). The National Artisan Moderation Body (NAMB) in collaboration with the industry has developed the Plastics Manufacturing Machine Setter Trade qualification (NQF level 4). However, at the moment there is no TVET College that has the necessary equipment and trainers to teach this qualification. Engineering plastics production typically require more advanced capabilities (design, prototyping and 3D printing) offered by universities.

Quality of training

The figure below shows opinions on the quality of training:

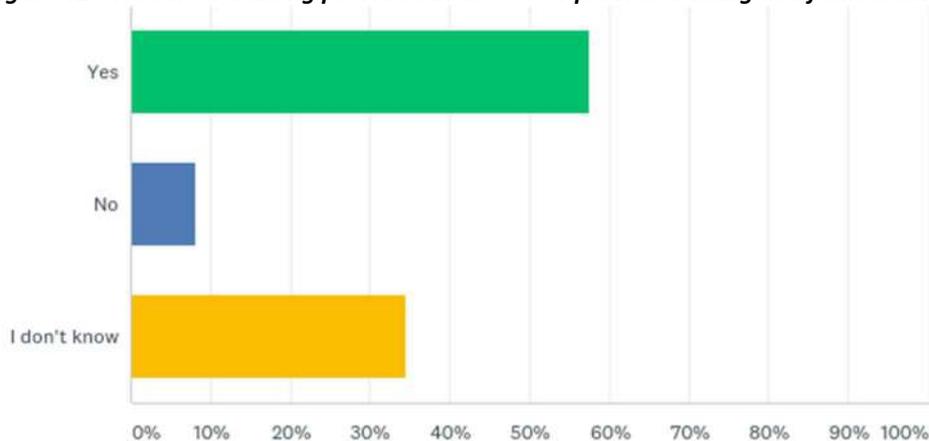
Figure 40: Training quality in Gauteng



Source: MerSETA survey of employers, 2018

The vast majority of survey respondents claimed to train in-house (83%) and it also scored the highest in terms of the quality of training. Almost 57% of employers surveyed thought the quality of training of providers was 'good', compared to just 8% who said it was not.

Figure 41: Accredited training providers in the sector provide training and facilitation of good quality



Some employers indicated that university graduates are overqualified for their operations and often too expensive for their line of work. Others have complained that when interviewing graduates as potential employees, they often found that even though the candidates have recently completed university, their technical knowledge is still lacking. Only 17% of employers indicated having a good quality pool of university graduates to recruit from whilst 44% did not know if there is a good quality pool or not because their nature or work do not require to recruit these graduates.

20% thought there was “a good pool of public TVET college graduates to recruit from”, while almost 37% thought the contrary. Interestingly, 43% did not mark an opinion on TVET college graduates, indicating perhaps how few were recruiting from the colleges.

In the interviews, there was not generally high regard for TVET programmes – dismissed as theoretical or a “waste of time”. A company owner says of a millwright he employed: “he went on a 2-3 week training prep in Kempton Park and then went to write his N6 – but it’s a waste of time. He can’t even do basic electrical (reverse direction on three-phase motor) – though he did it in college”. Entry-level welders had also disappointed him: “CO2 welders need to push the torch into the gas – but they come here and pull the torch. He has done the theory – but no practical.”

A training manager at AIDC reported: “The programmes offered at the TVET colleges do not speak to manufacturing processes.” The HR manager of a stainless steel cutting factory complained that the training of artisans was not up to scratch: “if you get someone with papers and you put him on a job you realise very quickly he doesn’t have the knowledge” (PC). An operator “takes three years before you get him through all the various scenarios – and then there’s still 25% to learn over 7 years”.

Arcelor Mittal concurred: “The national curriculum for artisans is too low for what we need.” The NCV was also not up to scratch. A fitter, for example, will learn how to align a motor and gearbox using a DTI – technology that’s been replaced by lasers. There was credit, however, that the qualifications were slowly changing through the QCTO and NAMB.

One automotive company (BMW) argued that the standard of training materials was deficient. “Sometimes in some of the catalogues, you can see that it is outdated. If you compare a manual from merSETA and one from a university on a specific topic you can see that there are differences between the two, you can see that one has the expertise. I have not found that the MerSETA material can be used, especially for the standard.” “Sometimes I think it is the red tape that bogs things down. By the time something gets released it is out of trend and we don’t need it anymore.”

A trade union interviewee (MISA) echoed this: “MerSETA does need to engage with stakeholders on the ground more. With changes that are happening, they get left behind. By the time a qualification is registered, it’s not needed.” A Numsa representative argued that the Retrenched Employee Programme (REP) – which covers 50 credits or six months – is “very minimal” and does not prepare retrenched workers to set up their own small businesses (Malebo). She explains: “Currently they can do steel fabrication, welding, burglar doors. But what about manufacturing of components that are supposed to be used in an automotive - can they be able to do that? The answer is no – because of the level of skill that they are exposed to whilst they were employed and in the programme as well and that is the challenge we have. The programme is meant well and we are trying because we have actually registered a number of cooperatives out of those retrenched workers but they got stuck because they could not have money to buy tools.”

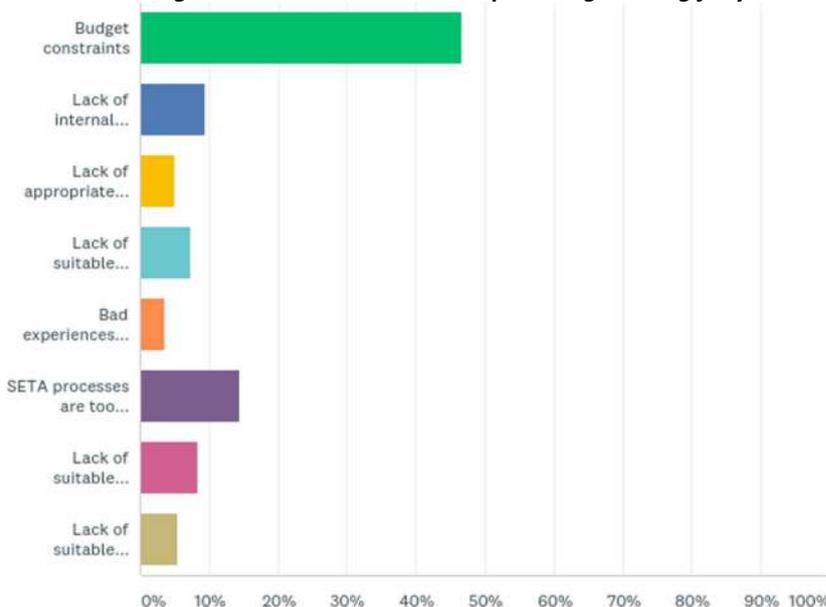
Questions were also raised about the quality of tertiary graduates. Few employers in the survey (just 17%) said they had “a good quality pool of university graduates to recruit from” – and 38% answered ‘no’ to the question.

One interviewee told of a young-graduated project manager: “He’ll sit in his ivory tower in the northern suburbs in an air-conditioned office. He needs to come here and know the frustrations of bad drawings and steel that’s not up to specification. Huge divide between those with tertiary knowledge and those working here. Mining used to give you very decent training. People underestimate the guys out here – they think they are a bunch of bananas but they are so alert to what’s going on. They are like the hound dog – that gets whipped to death but some of what they do is sensational and they don’t get the accolades they deserve” (MS).

The internet was becoming an important tool for learning. Said one employer “Japie will surf internet at night and want a new tool in the morning. ... You can learn how to threadmill on the youtube.” Arcelor Mittal said they were starting to use virtual reality for training purposes. The HR manager explains: “We’re becoming more autonomous and embracing e-learning and m-learning (mobile learning). With our new intakes we are starting to trial tablets. Assessments are electronic and automatic. Embracing virtual reality for our safety related courses – into augmented reality – so can take a picture of a machine on cell phone and overlay augmented reality with sketches – click for step-by-step processes. Micro-learning is a big thing. I’ve developed an app for micro-learning – as they come in, it says ‘welcome to AM. What are you going to learn today?’ Just-in-time learning is important for our knowledge seekers today – max 3-4 min video clip on what they need to do (just before they need to do it).”

MISA pointed out that because many of their members (in motor retail) worked on commission, there was a preference for on-line training. The employer survey asked respondents to indicate what the main constraints were to offering training. Budget was most often cited as a limiting factor. Difficulties with navigating SETA processes was the next most marked impediment to training.

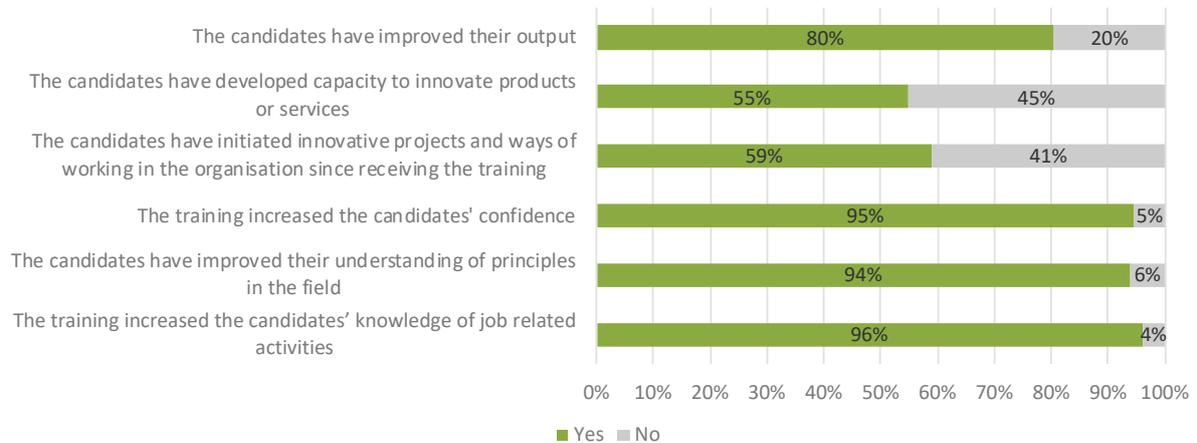
Figure 42: Main constraints in providing training for your existing employees



Interestingly, the employer survey showed up generally positive views on the benefits of training. As many as 80%, for example, indicated that training had resulted in improved output. In an interview, a Trade Union shopsteward in the automotive chamber (UD) agreed that workers were better skilled

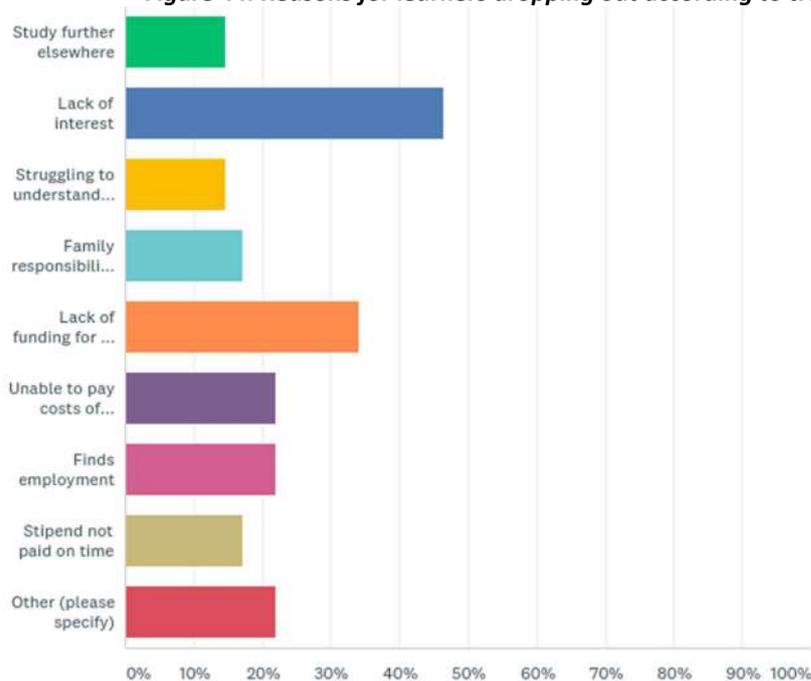
(and better paid) as a result of the establishment of the skills levy which had stimulated employer's willingness to invest in worker training. In the company where he was union rep, the Workplace Skills Plan (WSP) was signed-off by both management and labour.

Figure 43: Training outcomes



When we surveyed training providers for the reasons they thought learners were dropping out the courses, lack of interest (46% thought so) surpassed lack of funding (for fees) as a reason.

Figure 44: Reasons for learners dropping out according to training providers



f. Conclusion

The Gauteng Province has used its industrial development policy to encourage growth in manufacturing. Following on the example of national policy, the focus has been on SMME support and on township enterprises and on beneficiation (especially in the auto chamber). Moreover, policy intends to bolster innovation and a knowledge based, smart and green economy.

The automotive chamber has received substantial support from the provincial government through the AIDC, which includes facilitating skills development. The sector's contribution to the Gauteng economy has been positive and GVA has grown from XX to XX in xxxx. Yet employment figures have declined – particularly of semi-skilled workers. Demand is for skilled artisans, especially electricians and engineers – a demand likely to increase in future as electric cars become more popular. But the automotive sector is well catered for in terms of skills supply. The auto assemblers have their own equipped training centres. They recruit those who have already graduated and upskill them on their specific manufacturing processes. They have also invested in training beyond their own needs.

The metals chamber, by contrast, has been contending with adverse economic winds. Small to medium sized companies have had to find niche markets or have relied on manufacturing once-off products or 'jobbing' (single job specs for maintenance). Even Arcelor Mittal, the biggest metals manufacturing company has had to scale back on products and has not hired new staff. With employment down, and a pool of unemployed semi-skilled people to draw on, there has been less urgency to invest in skills development. Arcelor Mittal trains sufficient numbers of artisans for its own needs and a surplus. Interviews with metals companies confirm the survey results which show that, in general, companies prefer to train in-house.

The motor industry is probably the most intensive in terms of training in numbers. Here there is a greater reliance on TVET colleges to do the training than in-house. Workshops hoping to get insurance-related work need to have certified workers.

Appendix 2: Mpumalanga Provincial Report: Supply and Demand of Skills

This report, which details the demand and supply of skills in the Mpumalanga, forms part of the Region 1 research study commissioned by the MerSETA. The purpose of this study is to identify and document the character and scale of labour and skills needs in the MerSETA in Region 1 (which includes the NW, Gauteng, Mpumalanga and Limpopo) covering all the five chambers, namely; automotive, motor, metals, plastics and new-tyre. The intention is also to describe the change drivers in the nature of work and of skills, and to evaluate the appropriateness of different education and skills development practices in the sector.

This report contains the following sections: a methodology, an analysis of the provincial industrial policy. Chapter two is an overview of the MerSector in North West. Chapter 3 deals with a statistical breakdown of the number of employers and employees, size of businesses, and the economic performance of the MerSETA chambers. Then, Chapter 4 looks at the skills demand including scarce skills, while Chapter 5 is about skills supply and looks at the kind of training employers use and whether this is to upskill or reskill employees. Chapter 6 which is the final chapter, summarises the key findings and conclusions of the investigation.

a. Methodology

This study sought to identify and explain skills shortages across the chambers of MerSETA in the Mpumalanga. The study used secondary literature and statistics as well as the collection of primary of qualitative and qualitative data. An electronic survey was sent out to both employers and training providers. Data from statistics South Africa and other statistical sources relating to the MerSETA was also analysed to obtain an understanding of the sector.

In-depth Interviews were conducted with employers in the five chambers. The interviews centred around business performance, employee trends and skills and training practices. This was done through face-to-face interviews with employers in the metal, plastics and motor sectors; face-to-face interviews with TVET colleges and other training providers. The table below provides the number of employers that took part in the study through interviews and the survey.

Table 26 Number of respondents

Instrument	Motor	Metals	Plastics	New Tyre	Training providers	MerSETA	Total
Employer electronic survey	31	28	1	1			61
Face-to-face employer interviews	3	8	2	1	6	1	21

As with any study, there are limitations to this study. The aim of this study was to cover all five MerSETA chambers, various sized employers, labour as well as provincial government and training providers. In addition, the informal sector was covered. Given all these parties, the scope of the project is fairly large and in as much as one would like to obtain a representative sample, this may not

be always be possible. Furthermore, given that larger companies usually have dedicated human resource departments and dedicated training divisions, it is usually much easy to contact larger companies for interviews. The researchers sought to maintain a balance in the voices however the bias is acknowledged.

b. Mpumalanga industry policy

The provinces industrial strategy is driven by the Mpumalanga Economic Growth and Development Path (MEGDP, 2011). The primary objective of the strategy is to foster economic growth that creates jobs, reduces poverty and inequality in the province. It focuses on infrastructure development, the green economy, agriculture, mining, manufacturing and tourism and other high-level services. The strategy is said to be aligned with the national industrial policy such as the New Growth Path and the Industrial Policy Action Plan.

A major goal of the provincial government's Mpumalanga Economic Growth and Development Path (MEGDP) is to expand the industrial base of the provincial economy. The MEGDP has identified mining and manufacturing as sectors that will assist in job creation. Mpumalanga Economic Growth Agency (MEGA) was established in 2010 to funds various projects in the province however there isn't a strong focus on manufacturing. MEGA focuses primarily on funding SMMEs, agro projects and farming, and housing and promoting trade and investment in Mpumalanga.

Manufacturing in the province has been identified as a sector that can assist in the achievement of the aims of MEGDP. Secondary and tertiary activities have shown growth in the province. However, manufacturing is still one of the largest contributor to the economy of the province followed by mining. The MEGDP has identified the manufacturing sector is critical for economic growth and job creation. This is because of the mineral endowment of the province. Beneficiation of these resources has the potential to open opportunities in the manufacturing sector for the province. However, industry has cautioned that beneficiation requires high skills and technology. Beneficiation is not labour absorbing however it cannot be ignored because of the potential multiplier effect. MEGDP also identified several constraints that will hinder the growth of the manufacturing sector. The key constraint is the non-availability of requisite skills. Advanced manufacturing and beneficiation require high-level skills of which there is a lack of in the province.

Despite MEGDP being optimistic that manufacturing will be a driver a growth, the sector faces some challenges. According to Reddy, Borat, Powell, Visser and Arends (2016), despite there being potential for employment in the manufacturing sector, growth is negligible and unlikely to expand. The reason for this is two-fold: there is tough competition from low cost imports from the Far East and certain manufacturing sectors are capital rather than labour intensive. The motor sector may benefit in that there is significant potential for growth in the auto manufacturing sector.

The manufacturing sector of the province also received a boost from the dti, through the Manufacturing Competitiveness Enhancement Programme. In terms of Department of Trade and Industry (the DTI) support, from 2013/2014 to 2014/2015, a total of 19 projects were approved under the Manufacturing Competitiveness Enhancement Programme (MCEP) in Mpumalanga, for a total

value of R75 million. A further 16 projects were approved under the Manufacturing Investment Programme (MIP), with a value of R156 million (TIPS, 2016).

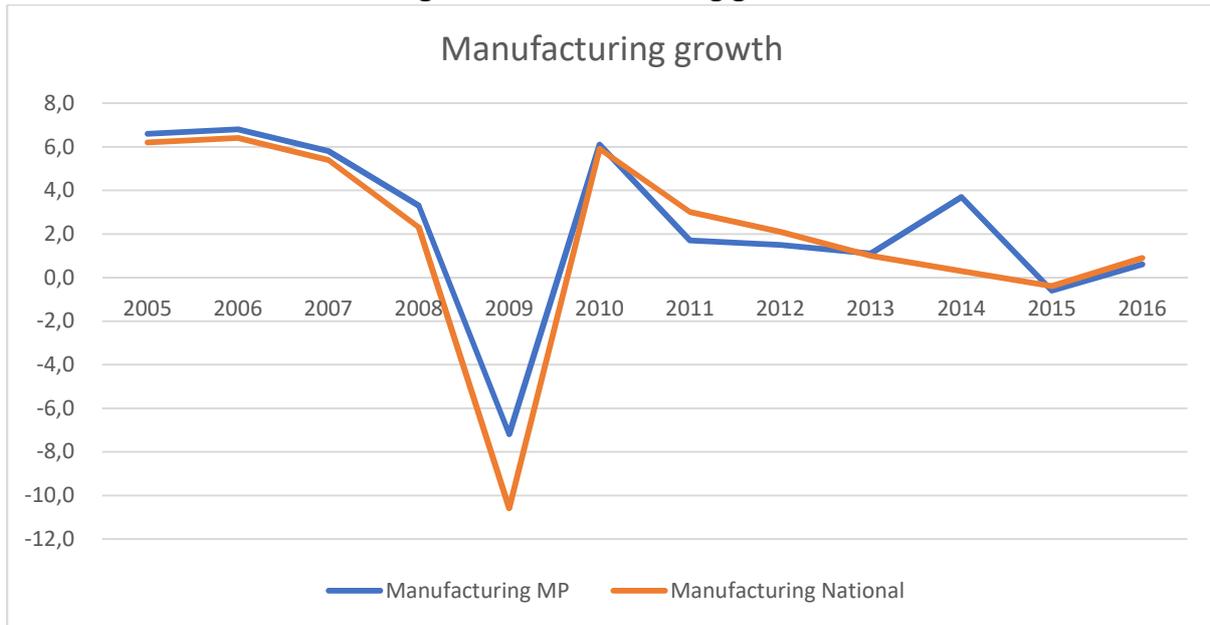
c. Economic context of skills development

The Main economic activities in the province are mining, agriculture, and tourism. However, the economy of the province is driven by mining, predominantly coal mining which is used to generate power in Eskom power plants of which most are located in the province. The coal is also in the synthetic fuel industry. Coal mining in the province accounts for 83% of South Africa's total coal production and 90% of South Africa's coal consumption is used to generate electricity. Other minerals mined in the province include gold, platinum group metals, silica, chromite, vanadiferous magnetite, argentiferous zinc, antimony, cobalt, copper, iron, manganese, tin, andalusite, chrysotile asbestos, kieselguhr, limestone, magnesite, talc and shale. The MerSector in the province is closely linked to the mining sector because most of the work employers receive is from the mines around the province.

The economy of the province benefitted from the commodity boom between 2003 and 2011 (TIPS, 2016). However, there has been a marked decline and slow growth since then. This decline has had a significant impact on MerSector. Several SMME's were forced to close and 2015 saw Highveld Steel go into business rescue. The challenges at Eskom have also had an impact on the sectors with several projects being put on hold. However, Eskom has committed to investing in various Corporate Social Initiatives that will create 10000 jobs (Eskom, 2017).

Since 2009, there has been a steady decline in the manufacturing growth in the country. 2018 saw manufacturing decrease by 6.4 percent, the biggest drop since 2015 and reversing from a 4.3 percent gain in 2017. Six of the ten manufacturing divisions shrank, with the largest downward contributions coming from basic iron and steel, non-ferrous metal products, metal products and machinery, petroleum, chemical products, rubber and plastic products (Trading Economics, 2018). Manufacturing in Mpumalanga has not been left out of the downturn that has affected the country. **Error! Reference source not found.** below shows the decline in manufacturing for the country and for Mpumalanga.

Figure 45 Manufacturing growth

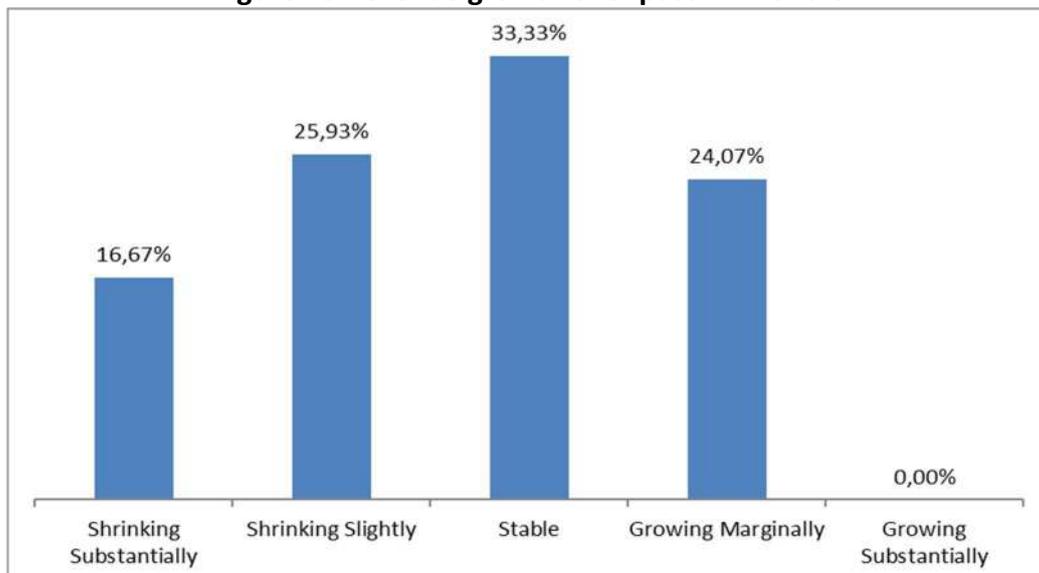


Source: SARS, 2017

The downturn is evident in the province with many employers interviewed stating they have not been doing very well. Furthermore, there have been several both large and SMME companies that have had to close, retrench or go on short time.

Error! Reference source not found. below shows whether employers experienced growth in the previous 12 months. A large percentage of the survey respondents echoed this view of the manufacturing sector. 42.6% stated that business is shrinking in the MerSector. A third stated that growth was stable. It is important to note that none of the respondents stated that they are growing substantially. Many companies in the province were surviving through jobbing. They were taking smaller jobs where they could to survive.

Figure 46 Revenue growth over past 12 months



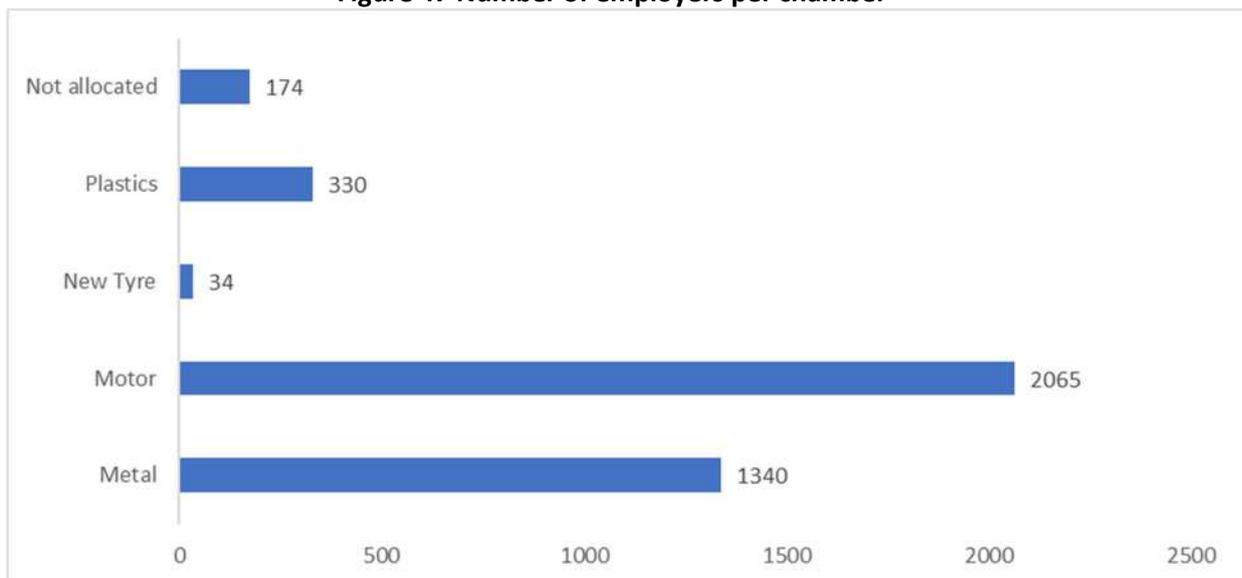
Source: Employer survey, 2018

The MerSector in Mpumalanga is dominated by the metals and motor chambers. Plastics and new tyre are represented in the province, however to a far lesser degree than metals and motor. There is no auto-manufacturing activity in the province. This chapter provides an overview of the Mer sector in the province.

d. Profile of employers in the province

According to the 2017 South African Revenue Services (SARS) database of employers in the manufacturing, engineering and related services, there is a total of 3943 employers in the province across the metals, motor and plastics. The motor chamber is the largest in the province accounting for 52.3% of total employers. The chamber comprises both manufacturing, maintenance and retail of parts and accessories of motor vehicles. The metals chamber is the second largest with 34% employers who are involved in manufacturing of metals products and their installation in construction work. The plastics chamber is the third largest with 8.4% employers who manufacture plastic products and do recycling. New tyre is the smallest chamber with 0.9%. **Error! Reference source not found.** below shows the number of employer per chamber in the province.

Figure 47 Number of employers per chamber



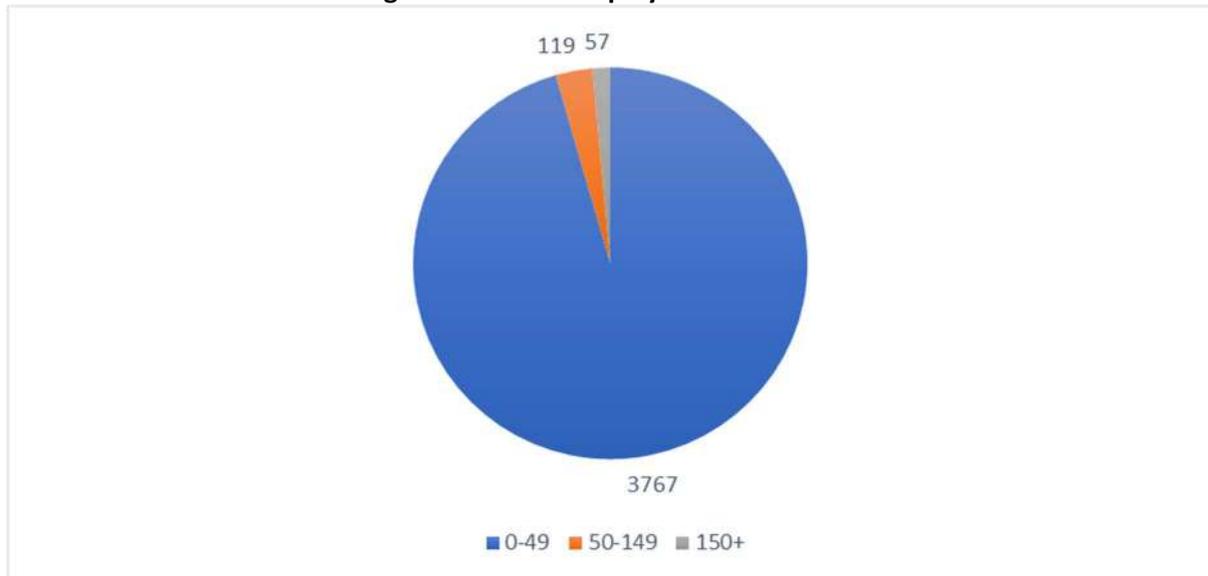
Source: SARS employer database, 2017

Size of employers

Figure 2 below shows a breakdown of employers in the province by size. The majority of employers (95.5%) in the MerSector are small employers with 0-49 employees. 3% of total employers in the MerSector are comprised of employers with 50-149 employees. Large employers (150+ employees) form 1% of total employers. The majority of the MerSector in Mpumalanga is comprised of SMME companies and is in line with national trends. **Error! Reference source not found.** below shows the size of employers in the sector.

National policies state that employment and economic growth will be driven by small to medium enterprises. Given that a large share of companies in the province and nationally fall into the SMME category their role in economic growth is feasible. However, the current state of the economy is not conducive for economic growth and this shows in the negligible growth in employment in the sub-sectors. Furthermore, a challenge for skills development is that SMME's do not have sufficient resources for formal training. Some interviewees stated that training is costly in that they must take staff off the production floor and this has an impact on output as well as paying for the training. Others elaborated that formal training is avoided because once the employee is certified, they leave for higher wages.

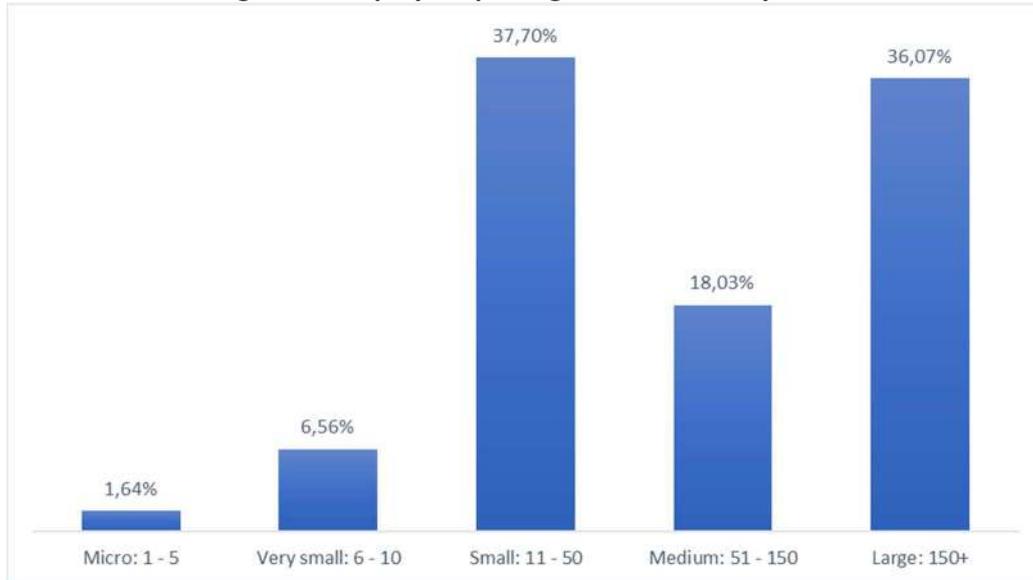
Figure 48 Size of employers in merSector



Source: SARS employer database 2017

The survey respondents also followed the same pattern with a large share falling into the SMME category. Error! Reference source not found. below shows a breakdown of the size of employers from the survey.

Figure 49 Employees per organization: Survey data



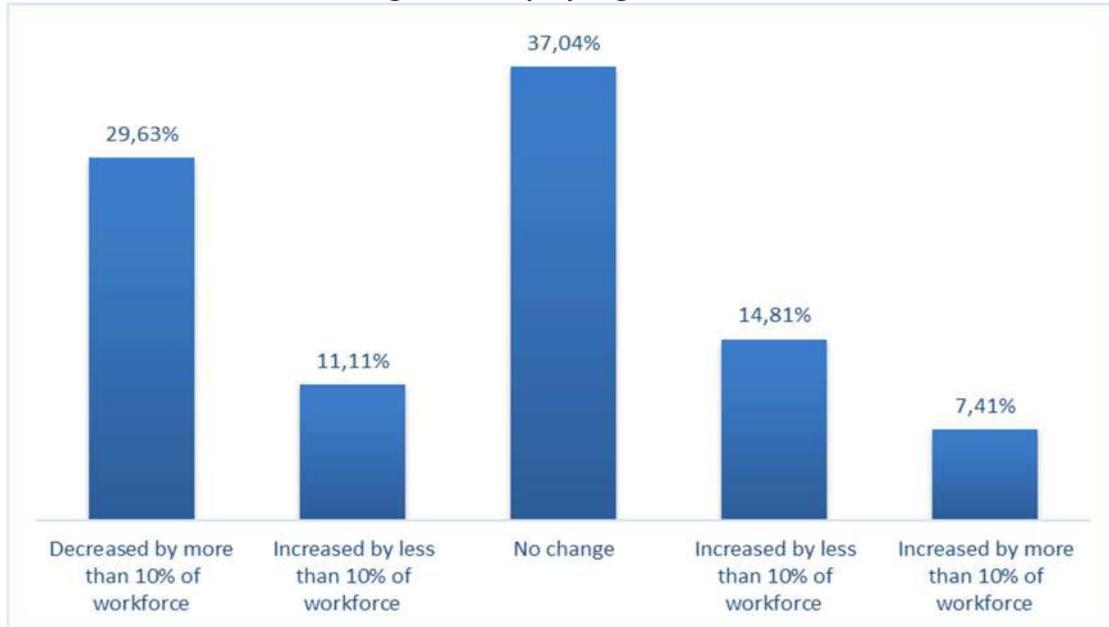
Source: Survey data 2018

e. Changes in employment

According to the Community Survey (2016) Mpumalanga has a population of 4.3 million with a labour force of 1.7 million (Quarterly Labour Force Survey, 2018). Out of the labour force, 31.5% is unemployed. The total number of people not in employment, training and education (NEET) in Mpumalanga is 1 103 000.

Error! Reference source not found. below shows the growth of employers in the MerSector. Over a third of employers stated that there has been no change in the number of employees in the past year. Employment numbers are mostly stable in the MerSector in the province.

Figure 50 Employee growth rate



Source: Employer survey 2018

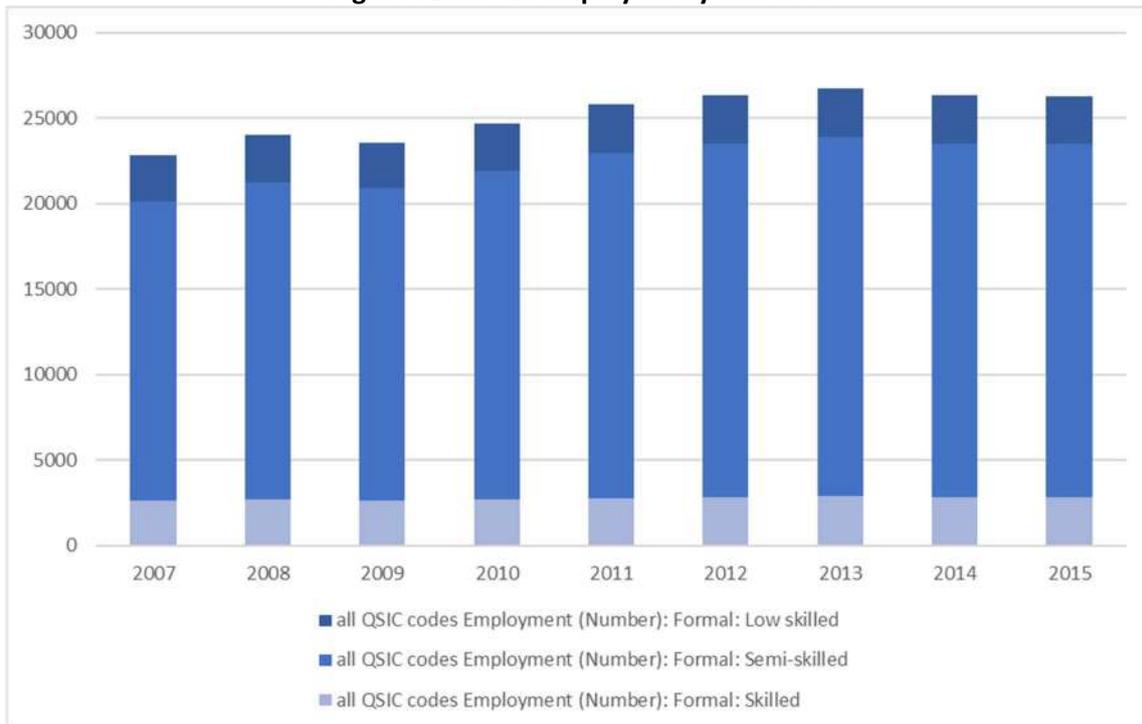
Metals

The metals sector in South Africa has been adversely affected by the current state of the economy. One of Mpumalanga's largest employers, Highveld Steel was placed in business recuse and retrenched 2000 jobs in 2015 (Faku, 2017). Highveld Steel is not the only to suffer, many SMME's have shut their doors or downsized.

Error! Reference source not found.below shows the changes in employment numbers for the metals sector. Between 2007 and 2010 there was stable growth in the number of employees in the formal and informal sectors, however 2009 saw a dip in the number of those employed in the sector which was as a result of the 2009 financial crisis. All skill levels were affected by the financial crisis, suggesting that employers in the sectors were severely affected by the crisis and did not implement in strategies in order to curb retrenchment. The market rebounded in 2010 but has seen negligible growth. The table includes employment number for QSIC codes for metals; basic iron and steel products, casting of metal; non-ferrous metal products; structured metal products and other fabricated metal products.

The United States of America announced the possibility of imposing tariffs on imported steel and aluminium products in 2018. Although South African imports to the US represent a very small portion of their total demand, the amount exported by South Africa represents 5% of production in the country. The potential loss of the US market puts in jeopardy 7500 jobs along the value chain (Creamer, 2018).

Figure 51 Metals employees by skill level



Source: Quantec data, 2017

Error! Reference source not found. below shows the total employment number for the metals sector in Mpumalanga. Employment in the formal sector has been on the decline in general and where there was growth it was negligible. Interestingly, there has been noticeable growth in the informal sector.

Table 27 Total employment: Metals

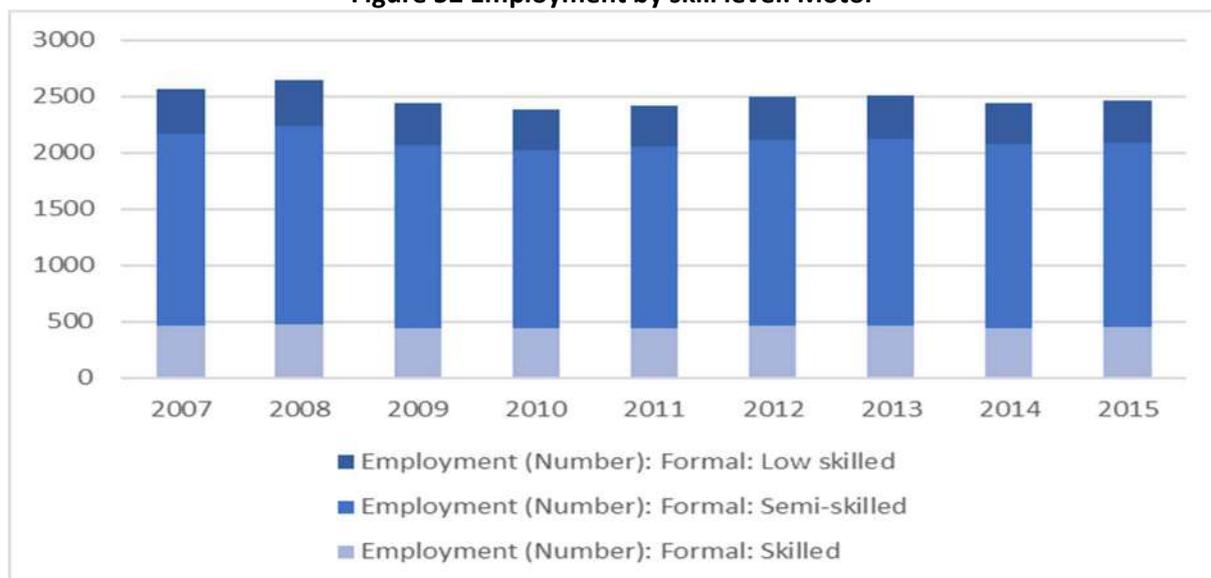
	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total	25865	27092	26855	28270	29526	29581	30578	29935	30035
Formal	22825	24036	23546	24683	25795	26353	26745	26349	26266
Informal	3040	3056	3309	3587	3731	3228	3833	3586	3769

Source: Quantec data, 2017

Motor

The motor chamber in Mpumalanga is the second largest chamber although the chamber does not have as many employees as the metal chamber. The chamber was also affected by the 2009 Financial Crisis and saw a decrease in the number of employees, however the chamber has had a stable number of employees across all skill levels. **Error! Reference source not found.**, shows employment by skill level in the motor chamber.

Figure 52 Employment by skill level: Motor



Source: Quantec data, 2017

Error! Reference source not found. below shows total number of employees in the motor sector. Employment growth is negligible in the sector with very little change in employment. There was no data available on the informal sector. The informal sector in Mpumalanga is reported on in a separate report.

Table 28 Total employment: Motors

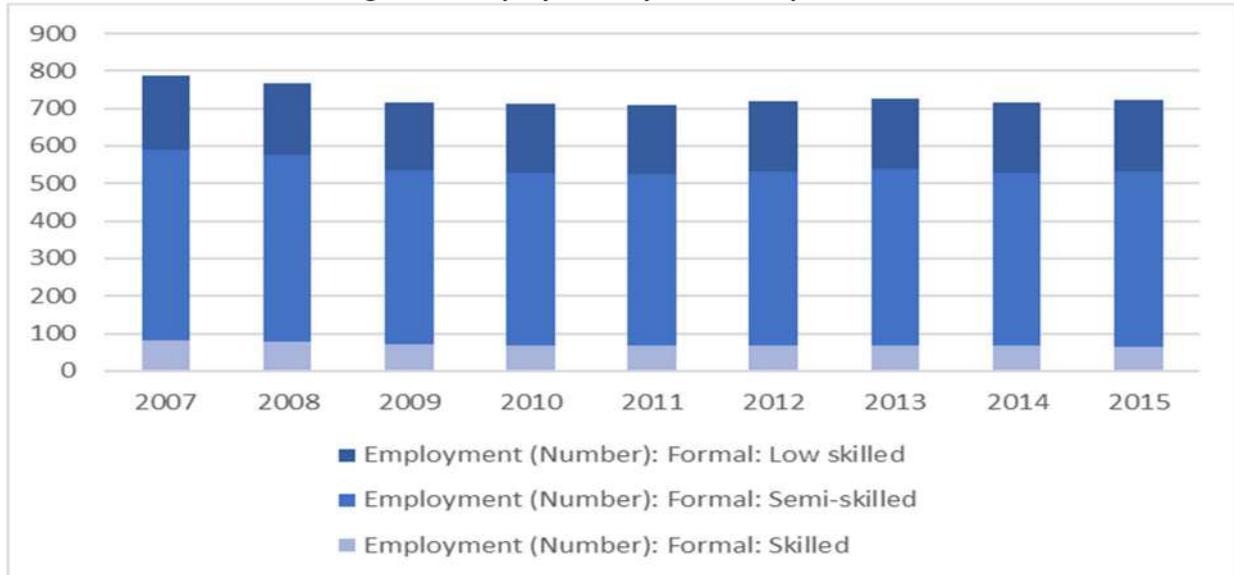
	2007	2008	2009	2010	2011	2012	2013	2014	2015
Employment (Number): Total	2569	2641	2438	2378	2422	2494	2503	2443	2460
Employment (Number): Formal: Total	2569	2641	2438	2378	2422	2494	2503	2443	2460
Employment (Number): Informal	0	0	0	0	0	0	0	0	0

Source: Quantec data, 2017

Plastics

The plastics sector in Mpumalanga is very small compared to its neighbour Gauteng. The plastics sector in Mpumalanga is small with on average 700 employees. The largest plastics employer in the province is Multikinit and there are several smaller companies involved in plastics production. The 2008 Financial Crisis did not have a significant impact on the number of the employees in the sector and numbers have remained stable over time. Like the metals and motor chamber, there is a preference for semi-skilled employees. The number of skilled employees in the sector has remain steady over time. However, at the semi-skilled and low skilled level there has been a more noticeable declined in the number of employees. **Error! Reference source not found.** below, shows the number of employees in the plastics sector.

Figure 53 Employment by skill level: plastics



Source: Quantec data, 2017

Error! Reference source not found. below, shows the total employment in new tyre for the province. Similar to plastics, the sector is very small and employment growth is negligible.

Figure 54 Total employment: New tyre

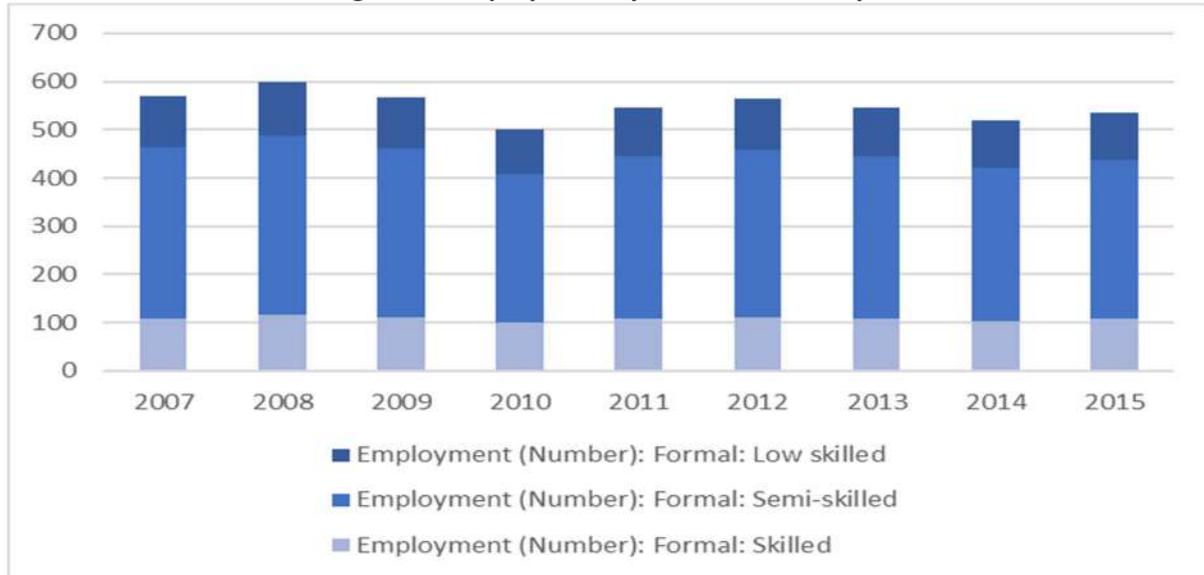
	2007	2008	2009	2010	2011	2012	2013	2014	2015
Employment (Number): Total	813	793	733	729	727	734	744	733	739
Employment (Number): Formal: Total	786	767	717	711	709	718	726	716	721
Employment (Number): Informal	27	26	16	18	18	16	18	17	18

Source: Quantec data, 2017

New tyre

New tyre is the smallest chamber in the province, employing on average 540 people. Similar to other chambers, employment growth is negligible in the sector.

Figure 55 Employment by skill level: New Tyre



Source: Quantec data, 2017

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Employment (Number): Total	569	600	568	500	547	564	546	519	534
Employment (Number): Formal: Total	569	600	568	500	547	564	546	519	534
Employment (Number): Informal	0	0	0	0	0	0	0	0	0

Conclusion

Across each merSector chamber, there is a preference for semi-skilled labour. Rankin, (2016) attributes this to the relationship between labour productivity, labour cost and factor intensity. Labour productivity has in South Africa has increased over the past 20 years. This increase resulted in an increase in real wages. Furthermore, smaller firms have become more productive than larger firms so are real wages. This is causing smaller unskilled-labour intensive firms to exit the sector and as such increasing the demand for semi-skilled labour. This is evident across each merSector. The number of lower skilled workers is much lower than semi-skilled.

Another reason for the demand for semi-skilled labour is because SMME's cannot afford to pay skilled labour market related wages. As such, prefer to hire a semi-skilled worker who can do similar work to a skilled worker and have fewer skilled workers supervising semi-skilled workers. The merSector is shrinking, and this is evident in the negligible employment growth. This presents a challenge for skills development in that the industry in general is struggling and many companies are closing down leaving those with skills unemployed and those pursuing various skills, with nowhere to do their practical component and work.

f. Skills demand

There is a difference between the skills demanded by large companies versus SMME's. There are number of reasons for this. Larger companies have larger training budgets than smaller companies

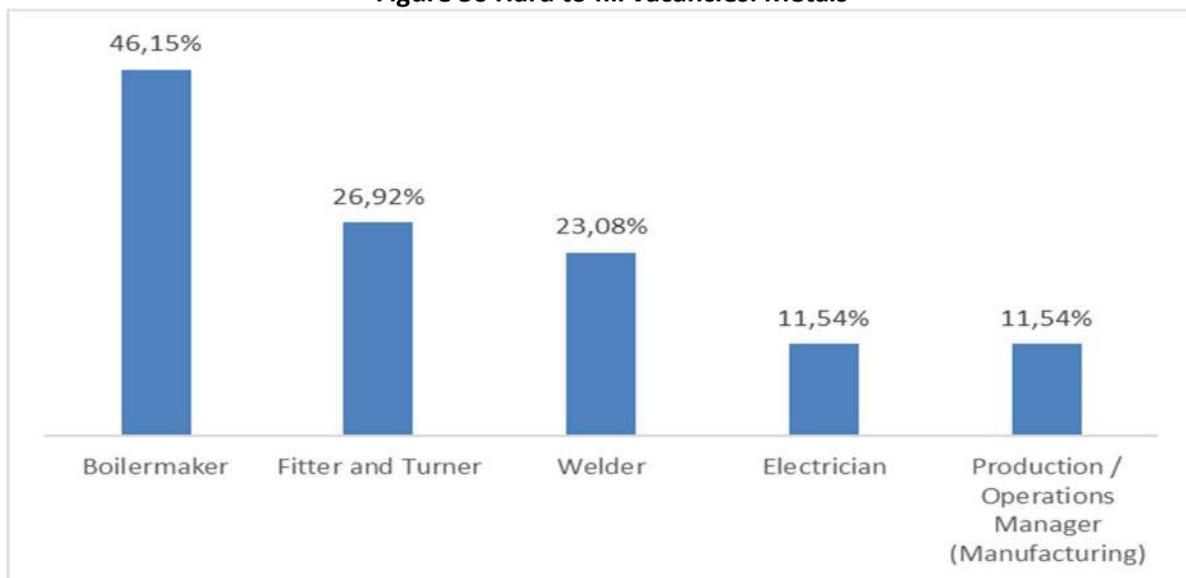
and as such they can train for the skills that smaller companies are not able to train for. Another reason is that smaller companies need particular skills however they are not able to afford to pay for those skills and as a result of this they have a preference for low skilled labourers. For example, a smaller company may require a boilermaker at NQF level 6 but can only afford a NQF level 2 boilermaker. This also affects their ability to retain highly qualified staff because they are not able to pay them market related wages. Lastly, the cost of taking a worker of the production line has a far greater impact on production than for a larger company.

The study also found that there was a lack of consensus regarding what skills are in demand in the province. Large companies held different views to SMME's within each sector. Even within the large company cohort and SMME cohort, there was no consensus as to what scarce skills are in each sector. This lends credence to the notion that scarce skills maybe a political term rather than an actual need. This section will focus on skills demand within Mpumalanga MerSectors.

Metals

Error! Reference source not found. below shows the hard to fill vacancies in the metals chamber. The number represents the percentage of respondents selected the occupation.

Figure 56 Hard to fill vacancies: Metals



Source: Employer Survey, 2018

Reasons why vacancies are hard to fill

- No qualified artisans
- No educational qualifications
- People don't have the right school qualifications
- We train them then they leave for better salary then we start again
- Remoteness of area
- Lack of skills and knowledge
- Difficult to find competent / experience People
- Applicants does not have the necessary skills, even though their qualifications show that they do have.

- Lack of quality artisans

The standard of training was another reason why boilermakers were hard to find. A training provider stated: "According to our standards at ***, they are bad. We have a 80% pass rate, so anything under that, you won't pass. Some guys come here and say that our standards are too high, but we just keep it as it is, because now you are on site as a site manager, and you have a boilermaker that has no idea how to do the basics. People need to be able to pass the critical aspect of training and keep up with the new aspects as well....I've got some people here that are qualified boilermakers. They have the red-seal and everything, then I give him a test, I'll show him a picture of a hammer and ask him what it is, his response will be, "that is something to hit with".

Reasons why Fitter and Turner vacancies are hard-to-fill

- Qualified artisans to operate older machines
- Lack of bearing fitment experience
- No educational qualifications
- Finding competency / experience People
- Lack of experience
- Lack of skills

Employers interviewed stated that although they are able to find Fitter and Turners, they were not able to find employees who are able to work at the required pace. "Good fitters and turners that can work at our pace are very hard to find. Our pace is different from other people, because of the demand." Another employer stated that they had a need for just turners, because of the type of material they work with. "going into manufacturing outside of mining, because mining has got fitters because you know mining they do more fitting than they do turning but in manufacturing, the technology for fitting and turning is fairly new. So that is why we find it so hard to get experienced turners"

Reasons given in the survey for why welder vacancies are har-to-fill

- Applicants does not have the necessary skills, even though their qualifications show that they do have.
- People don't have the right school qualifications
- No qualified artisans

There was a need for welders in the industry. The main reasons that were provided for the need for welders was the lack of qualifications, lack of properly trained welders and those who were qualified and had good training, were too expensive to retain. As one employer stated: "We are currently busy with welder testing and finding good welders is a big problem in our area. In 2016 we tested I think over a thousand people, so they come in, give them test pieces, then send that away for x-rays to see if they pass, I think out of the thousand that we tested we could only source about eighty odd people....because welding gets measured on the amount of welding that you deliver a day, quality welding....the South African welder will deliver 1.2m of which 800mm will be considered as good welding when passed through the x-ray but the 400mm would have to be redone. So you will have to go back, go grind it out, clean it again, prep it again and then only start welding again. That is a lot of wastage on production time."

Reasons given in the employer survey for why Electricians are a scarce skill

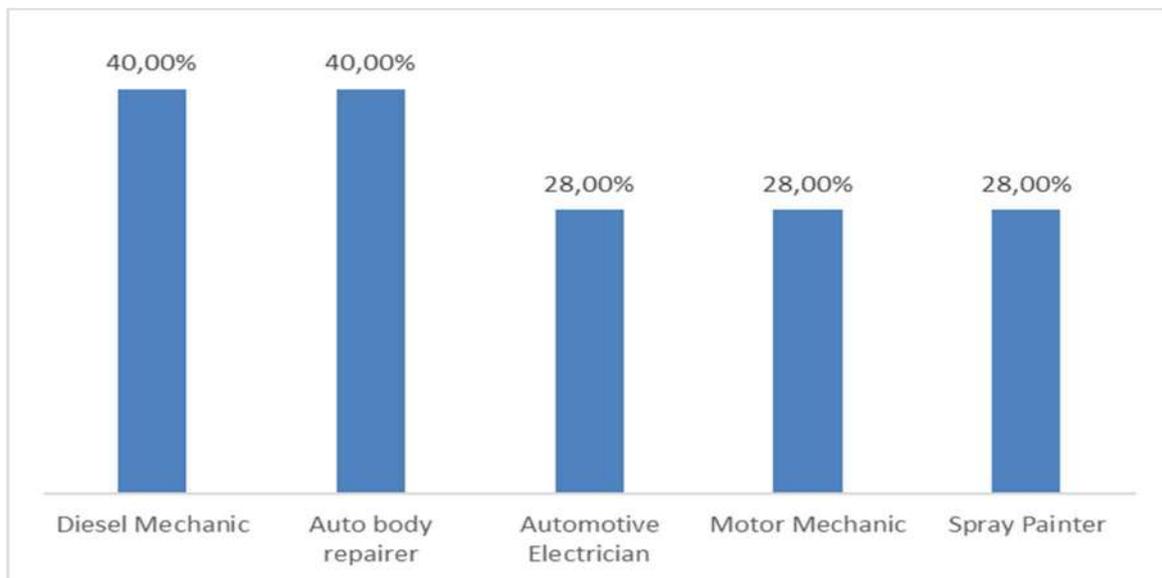
- Too low skilled although qualified Lack of latest technology
- Production/Operations manager
- Over qualified / no experience
- No educational qualifications & positions used to be reserved for old white male
- As per job and on limited duration contract

Larger companies stated that while it was relatively easier for them to find the above mentioned artisans, they had challenges finding production/operations managers. They stated that there was a lack of suitably qualified individuals.

Motor

Error! Reference source not found. shows the hard to fill vacancies in the motor sector in Mpumalanga.

Figure 57 Hard to fill vacancies: Motor



Source: Employer survey, 2018

Reasons why vacancies are hard to fill

Diesel mechanic

- We need to train them No qualified people
- Lack of proper training and experience
- No well qualified and experienced mechanics
- No public interest / qualifications to enter trade Salary scales out of line
- Not enough qualified, only semi-skilled
- Not understanding the need for Continuation-Job hoppers Scarce in the area
- Qualified through bursaries, but they do not have the basic knowledge

Auto body repairer

- Not enough persons qualify to do the course to qualify
- Not many qualified auto body repairers
- No well qualified and experienced auto body repairers
- They are qualified with little knowledge
- Time off for learnerships

- Specialised field
- Properly qualified persons are not available, their repair methods have not kept up with modern technology in the motor industry

Automotive electrician

- Suitable Electricians is hard to find
- Lack of proper training and experience
- Not enough qualified technicians are available
- Their skills are scarce and there is a need for trained professionals in this field.
- Experience in the Brand is difficult to find

Motor mechanic

- No qualified people
- Proper training and experience Salary scales out of line
- None available in the province
- Qualified mechanics salaries at bigger companies are more attractive, and smaller businesses cannot compete in hiring at the same rate.
- Job Hoppers - not skilled enough and make lots of mistakes - no other option but to dismiss
- Market is flooded with qualified people who know nothing!

Spray painter

- The artisans can't do/don't know the job in practice.
- Not enough persons qualify to do the course to qualify. Not many qualified spray painters
- They are qualified with little knowledge
- Time off for learnerships
- Specialised field

Plastics

The plastics sector in Mpumalanga is insignificant compared to neighbouring Gauteng. The only hard to fill vacancy listed was:

- Plastics cable-making machine operator

There were no reasons given in the employer survey for why this vacancy is hard to fill.

New Tyre

This sector was also insignificant compared to neighbouring Gauteng. The only hard to fill vacancy listed was:

- Wheel alignment technician

The reason given in the employer survey for why vacancies are hard to fill is that "We are in a rural area".

g. Technology affecting skills in the merSector

In the metals sector, the last technological revolution that impacted skills was about 20 years ago with the introduction of CNC machining. To date there has not been such a technological push that required additional top-skills for workers. The Fourth Industrial revolution is currently upon us. A study

conducted by the World Economic Forum on the readiness of countries for future production technologies and processes (2018), found that South Africa was in fact not ready for the fourth industrial revolution and its ability to transform production and manufacturing. This is reflected in the interviews conducted with employers.

Technology in metals sector was not seen as something that was going to affect skills in the sector in the immediate future. One employer stated: “No, I don’t think in our industry. Maybe in a factory where there is a factory line, and robots can do the work. In our industry there’s physical hard labour”. However, it was acknowledged that technology is moving fast and that the sector should be aware of this. One employer made an example of drawing: “...drawings are being taken and I can imagine in the next two years, they not going to be taken, we are going to e-mail the drawings to the plant, straight to the machine and they will pick it up. That is how fast things are moving.”

Few employers stated that there was modern technology that was available in other countries. However, because of the cost, there would not be an uptake of technology in the near future and as such, labour would not be displaced. Furthermore, employers stated that with technology, there needs to be a skilled person who understands the production process to operate the machine: “technology wise, there is a lot of new technology. We started with stick welding, now you use different material for welding. There’s new technology, there’s computers. The machines are set by computers, people are basically the operators, especially if you’re working in the machine shop, and work on milling machines because all the new technology machines are computerised. You have to get training on that machine before you can work on it.” Another employer also echoed the same sentiment “displacement of labour? No. Not with us because I still need those three to run that machine.”

An employer operating in a niche market stated that technology has slightly affected their skills needs. “I used to have an apprentice in fitting and turning, and there was fitting work to be done because then the machine was not as computerised as they were using back then. You had to cut machine and then you had to fit the parts together.... when the coils are done then they need to be checked in the engineering department to say whether or not they will fit and then go in. Now we don’t need to really do that anymore because I have got my machines that measure my coils perfectly to say that the coil will fit. Even the machining side, hence that I am saying that I don’t have work for the fitting anymore.” Another employer, not in a niche market echoed this sentiment that technology will change the demand for skills but not displace labour all together, “It has not been automated at that level yet, but the skill required on the person there, that demand has increased. As to the person totally being written off, not yet.

For new tyre, there are number of interesting technologies that may affect skills in the sector. An employer stated that, “we have technology here that we sell to the mines, it’s called Tyre sense. It is a monitor that you put inside the wheel that measures the temperature and the heat, even the distance of your vehicle. What I like about the system is, you can put it on the computer, you can see all your machines with all your wheel positions, then it will tell you, dump truck number two is over inflated, or the heat is too high, you need to stop this truck. So, there is no one physically going out into the sun and taking pressure with a pressure gage. You can manage it from your computer.” However, it was not clear whether it would have an impact on skills.

Conclusion

As stated above, there is a lack of consensus in terms of what skills are scarce. Every company and sector has a unique understanding of what scarce skills and as a result of this, it is difficult to compile an exhaustive list of scarce skills. Technology has been recognized as a change driver in the sector however, employers believe that it is too costly for the country and as such it will not impact skills at the moment.

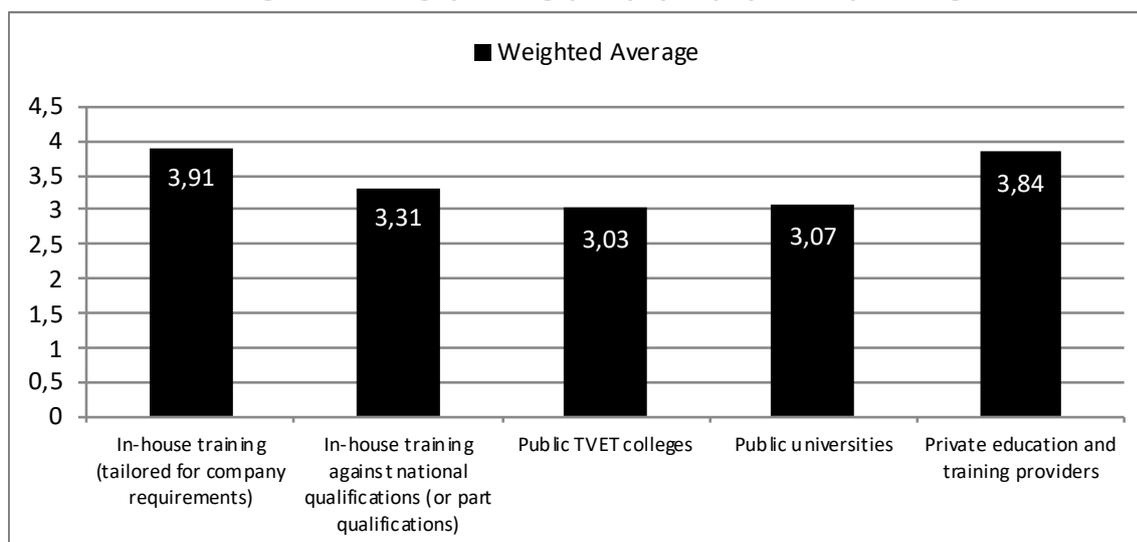
h. Skills supply

Employers across all four chambers in the province are training. The significant difference is the level at which they are training as well as the level of formality at which they are training. SMME's are training at a lower level and more informally than larger companies. Larger companies have large budgets and have their own dedicated training centres and train according to business unit needs. Furthermore, they train formally with certification available at the end of the training period.

SMME's companies stated that they prefer to train informally. This is because they felt that after they invest in training employees and getting them certified that would lead to the employees leaving the business. Other companies stated that employees wanted training based on that fact that their counterparts had received training however there was no need from training within the business.

Error! Reference source not found. shows how training is delivered. Employers in Mpumalanga utilise in-house (on-the-job) training (72%) as compared to other modes of training delivery. For formal qualifications they utilise private training providers (60%) and their own internal training centres (45%). A substantial proportion (32%) have also indicated the use of e-learning to train their staff. Public institutions have the lowest utilization rate with TVET colleges at 13% and universities at 15%. It must be noted that Mpumalanga has one university which is fairly new and therefore in all likelihood the employers are relying on universities outside the province.

Figure 58: Rating of training quality by employers in Mpumalanga



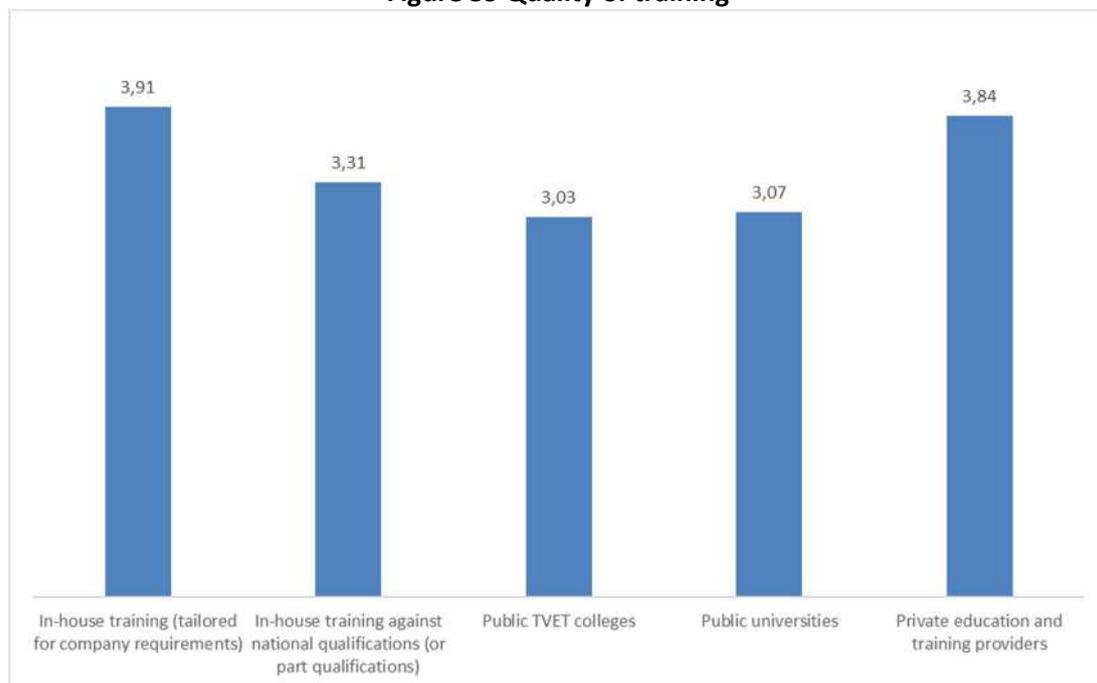
Source: MerSETA survey of employers, 2018

Despite the small number of accredited training providers as compared to Gauteng, half of the employers in the province believe that there is a sufficient number of training providers closer to their operations. In terms of quality of training, the employers view in-house training and training by private providers to be of almost the same quality. They also view the training by the public TVET colleges and universities to be average with mean scores of 3.03 and 3.07 out of 5 respectively.

Quality of skills supply in the province

Skills supply in the province was found to acceptable but could be improved. **Error! Reference source not found.** below shows the rating of the quality of training from different providers in the province. It should be noted that Mpumalanga does not have any public universities that offer MerSector related qualifications and as such the findings refer to universities outside of the province. Interestingly, TVET colleges had the lowest rating on quality where private education and training providers were ranked second highest. Employers corroborated this. They stated that graduates from public TVET colleges were not good quality. They stated that some of the content taught at public TVET's was out of date and not relevant to the industry. A large employer stated that, "I think we need to up the quality. If you say quality and you set the standard, many people will fall out because of this past that they had or being previously disadvantaged. So we are afraid to put the bar there. This is my opinion. I don't think we must lower the bar. We must rather equip people to reach that bar. If you lower the bar, then you are not doing justice to the people that you want to train."

Figure 59 Quality of training



Source: Employer Survey data 2018

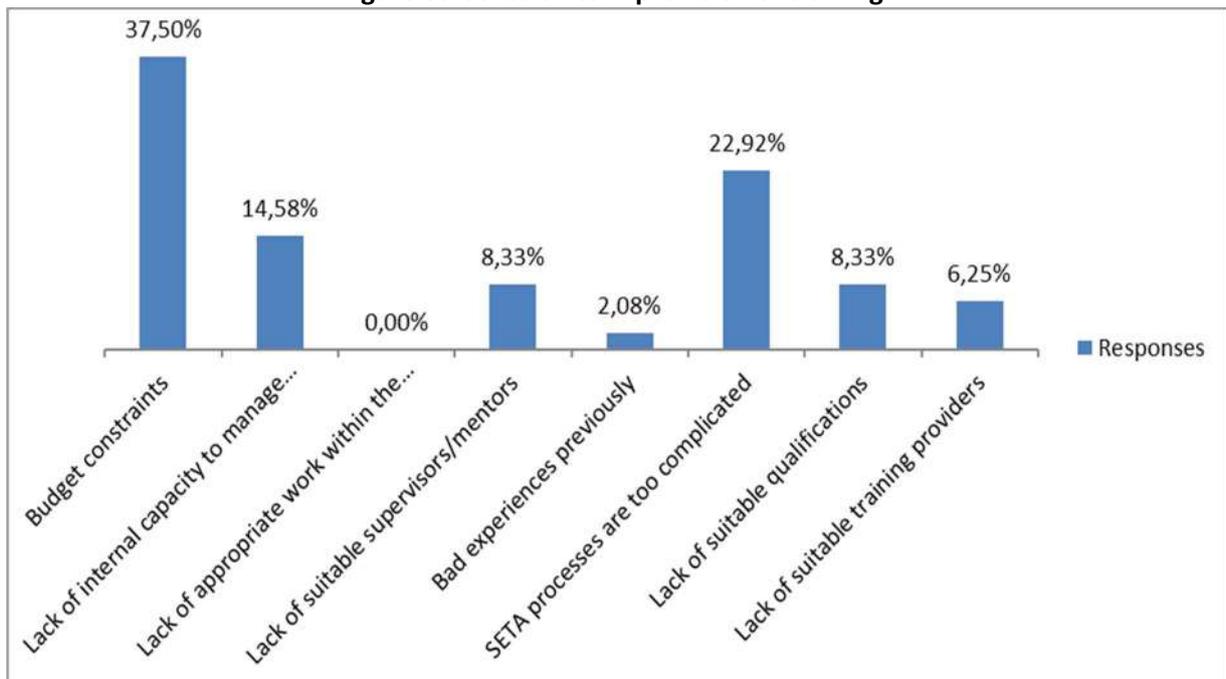
Challenges of skills development

For smaller companies, training is a costly exercise particularly formal training. Employees must be taken off the production line for training and for a smaller concern, this means a loss of productivity and output. Larger companies face the same challenge, however a larger company with more staff

and revenue can absorb the impact of the loss in productivity. As a result of this, smaller companies prefer to train on the job. Furthermore, several smaller company’s state that employees who receive formal training leave for an increase in wages which is often low. For them this is a loss on their part in that they have invested time and money in the employee and thereafter the employee does not return the investment by remaining with the company. One employer stated: “If you can work for R5 an hour more, will you go or stay? There are guys who leave for R5 or so more...It could mean R1500 more per month...we are investing four to five years into people. It costs money to train, plus trade testing. It could cost up to R22 000 for a boiler maker. Then while you’re there, for six weeks, I still pay your salary.” **Error! Reference source not found.** shows the challenges faced by employers in the portion of training.

Employers also mentioned that poor basic education in South Africa has far reaching implications for skills development. They stated that they could only employ those who had maths and science in matric. One employer stated: “these guys are hardworking labourers, some of them are qualified already. You get nowadays with grade 12, but all the wrong subjects, like Life Orientation, Geography, History and no Maths or Science. It makes it difficult in recruitment because if they apply here for a job, and he says he wants to be a welder, I’ve got a problem with your grade 12”. Those who did meet the entry requirements, training was at a lower level because workers did not have the requisite math and science level to be trained at a higher level.

Figure 60 Constraints in provision of training



Source: Employer Survey, 2018

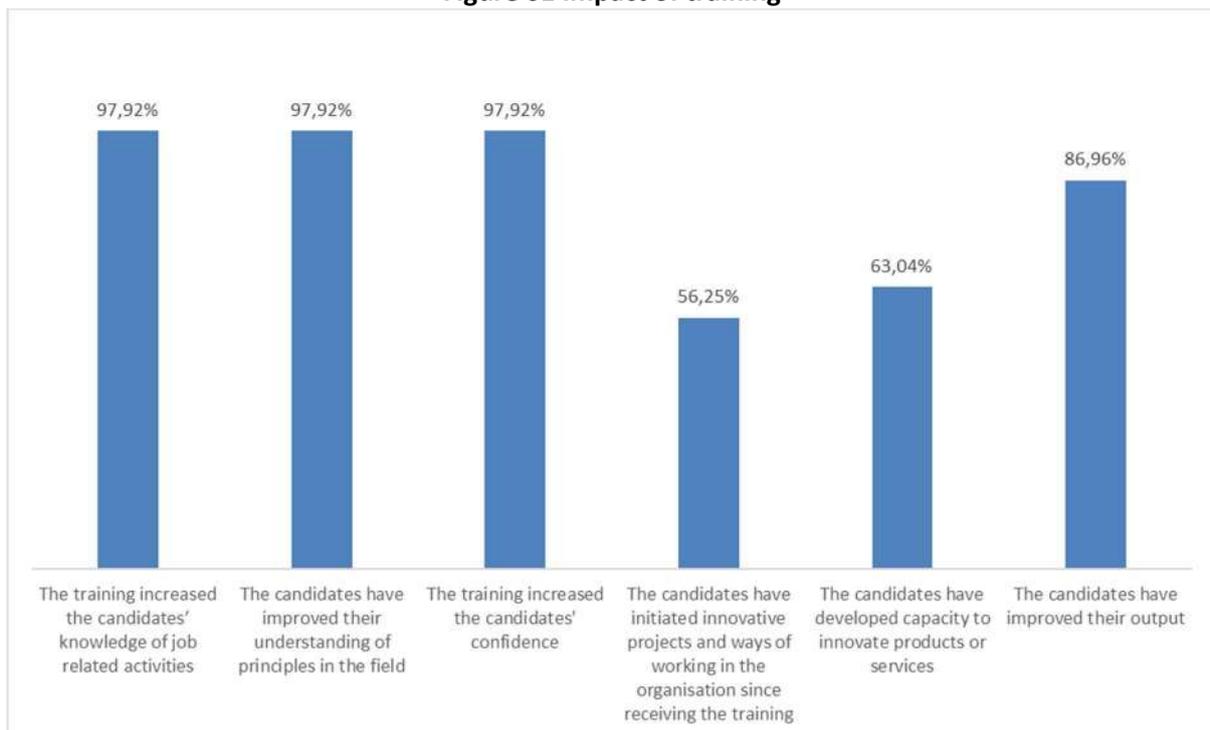
Successes in skills development

Despite the challenges of providing training, there have been some successes. Employers felt that training has an important impact on not only the employee’s performance at work but also in their personal life. The training they receive improves their work performance and the overall staff morale

and this has a two-fold effect. Through workers improving their productivity, employers also increase their profits.

Error! Reference source not found. below shows how training has improved the performance of the employees. Employers were given statements and asked to respond yes or no. In general, training has improved output, confidence in their work, their understanding of principles of the field and knowledge of job related activities. Interestingly, employers felt that training has not improved innovation. This is important because innovation is a key driver for employment growth as well as advance manufacturing.

Figure 61 Impact of training



Source: Survey data, 2018

Below is an example of a training initiative.

Jobshop Project-Empowering the community

Jobshop project is an initiative by the European Union, IDC and Vukani Ubuntu. The initiative, started in 2014, selects unemployed learners from around Mpumalanga and provides training at no cost to the learners. 60 people are taken in and trained in HVAC, electrical and welding from NQF 2-4. Currently these are the only qualifications offered, however there is a high demand for boiler making and fitter and turner. Job shop Project aims to offer these in the near future.

Learners are given a stipend during the training period. The training facility also accommodates disabled learners and 50% of learners are females. Learners are placed in companies around Witbank for work experience and the absorption rate is high.

Funding is a challenge for the project however, the impact on the community is important. The stipend the learners receive not only support the learners, but also support their families.

In sum, the employers interviewed and surveyed stated that they were training. Despite the tough economic conditions, there were still training employees. There was consensus around the fact that training needs to be improved in the various chambers. The major challenge identified was budgetary constraints and many felt that SETA processes were too complex, and this had an impact of training. Employers felt that training had a positive impact on productivity however it did not spark much innovation.

i. Conclusion

This study sought to test three themes which were found in both national policy industrial policy as well as Mpumalanga provincial policy: encourage localisation and beneficiation, reassure SMME's into enterprise ventures and push forward with advanced manufacturing.

Mpumalanga provincial strategy identified localisation and beneficiation as avenues for job creation, however given the current state of the economy and imports from countries that have achieved economies of scale, this has not taken place at a high scale. Injections from the Manufacturing Investment Programme (MCEP) and Manufacturing Investment Programme (MIP) have not done enough to improve localisation and beneficiation in the province.

This study has also found that given the current state of the economy, SMME's are in fact not employing enough to be considered drivers of employment in the merSectors. Metals is struggling in terms of growth and employment growth in the sector is negligible.

Technology and advanced manufacturing have not affected MerSector in Mpumalanga. Employers did identify that there is technology available and that internationally there is a drive towards technology, however not much technology is in South Africa because of the cost involved.

Appendix 3: North West Province: Skills Demand and Supply

This chapter provides details on the demand and supply of skills in the North West province. It analyses the provincial industrial policy and provides an overview of the merSector in North West, which includes the number of employers and employees in the sector, as well as a statistical breakdown of the economic performance of the merSETA chambers. The final sections deal with skills demand and supply as reported in an employer survey and through face-to-face interviews with employers in the metal, plastics and motor sectors and interviews with TVET colleges and other training providers. Data from statistics South Africa and other statistical sources relating to the MerSector was also analysed to explore the sector. The table below provides the number of employers that took part in the study through interviews and the survey.

Table: Number of respondents to survey and face-to-face interviews

Instruments	Motor	New-Tyre	Metals	Plastics	Training Providers	Prov Govt
Employer electronical survey	13	2	18	3		
Face-to-face employer interviews	5	0	1	1	3	1

a. Provincial Industrial Policy

The North West province has a mandate of achieving economic development, growth and accelerated employment. To achieve this, the province aims to focus on SMMEs, co-operatives and provincial exporters in the many townships, villages and small dorpias (North West Development Corporation, 2016).

More attention will be given to SMMEs through the creation and strengthening of enterprise support services. This will be done by providing mentoring, skills and incubation services for new and growing enterprises, the establishment of support units at local municipality for SMMEs and increasing the visibility of provincial government through outreach to provide information to the rural area. The province also plans to interact with ordinary community members in order to understand the challenges faced by SMMEs in villages, townships and small dorpias and to make it easier for them to access government tenders. Lastly, the province wants to establish SMME forums at district and local level to co-ordinate SMMEs activities.

To ensure that the strategy is executed effectively, the NWDC's approach will focus on Smart Specialization. "Smart specialisation is about placing greater emphasis on innovation and having an innovation-driven development strategy in place that focuses on each area's strength and competitive advantage. It aims at identifying factors of competitiveness and concentrating resources on key priorities. It also aims to harness area diversity by avoiding uniformity and duplication in investment goals. It combines goal-setting with a dynamic and entrepreneurial discovery process involving key stakeholders from government, business, academia and other knowledge-creating institutions" (North West Development Corporation, 2016:2)

Following this strategy helps to identify factors of competitiveness. It also helps with the allocation of resources according to the key priorities and to avoid the duplication of the investment goals.

Although this strategy has put a lot of emphasis on providing support and development for SMMEs in the province, this strategy hasn't been fully met. Based on both the face-to-face interviews and the employer survey, most SMMEs in the province are still struggling. According to them, they either get little or no financial or non-financial support from the province.

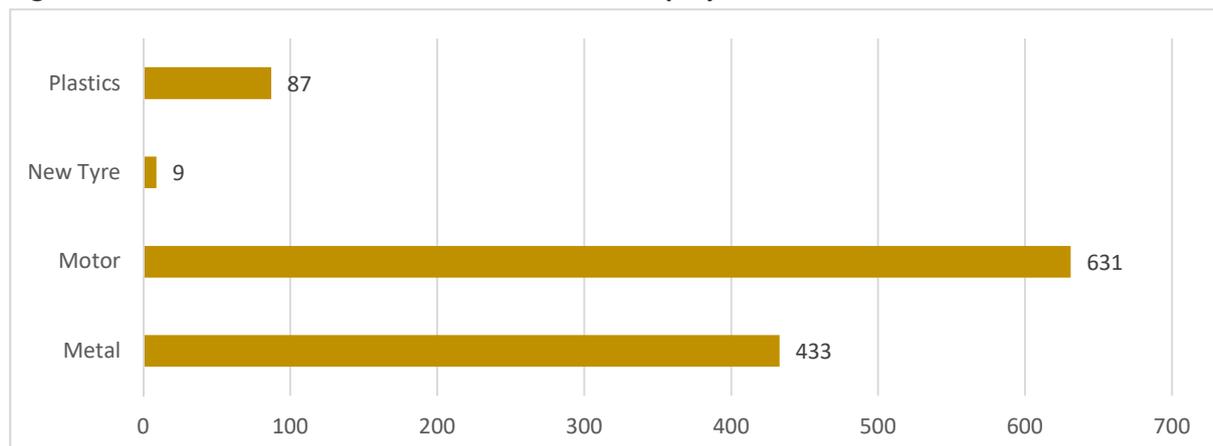
Manufacturing is low on the list of priorities of the NW Development Corporation. It comes after agriculture and agro-processing; Culture; Tourism and Mining and Mineral Beneficiation. Nevertheless, in part its aim is to use agro-processing to help link rural and urban economies. One idea is to encourage the North West's automotive industry to source leather-hides from the livestock industry for car seats locally. It is this sort of value-added tie-up that economic planners are looking at, as they aim to get more value out of the agricultural sector.

b. Overview of the MerSector in the North West Province

Employers in the MerSector

Data presented in Figure 1 shows the number of employers in the merSETA chambers. According to the South African Revenue Service (SARS) database of employers in the merSector, there are currently 1206 employers in the North West province under this sector. These are made up of 631 employers in the motor chamber, 433 in metals, 87 in plastics and 9 in new-tyre. It is clear from the information presented in the figure that the motor chamber is the biggest chamber in the North West province, while New-Tyre is the smallest chamber.

Figure 1: A breakdown of the number of employers in the merSector - North West

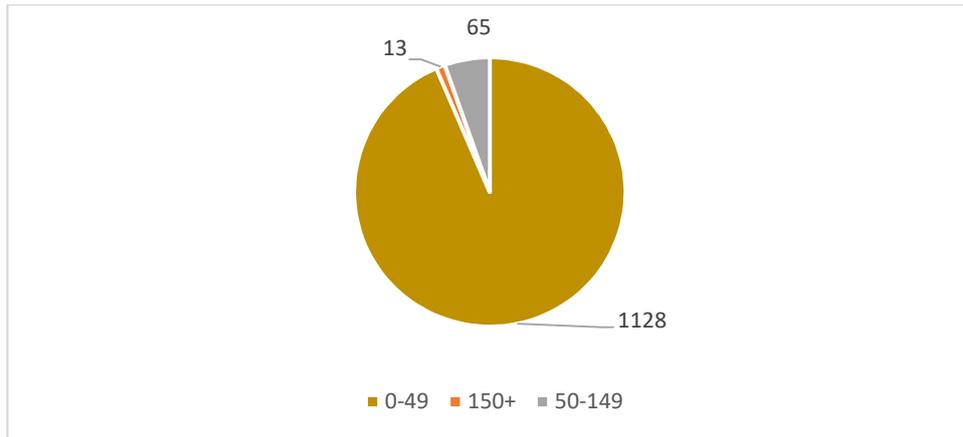


Source: merSETA Employer Database

Size of employers

As discussed above there are 1206 employers in the merSector. The majority employers are classified as small, employing less than 50 employees.

Figure 2: A breakdown of the size of businesses - North West

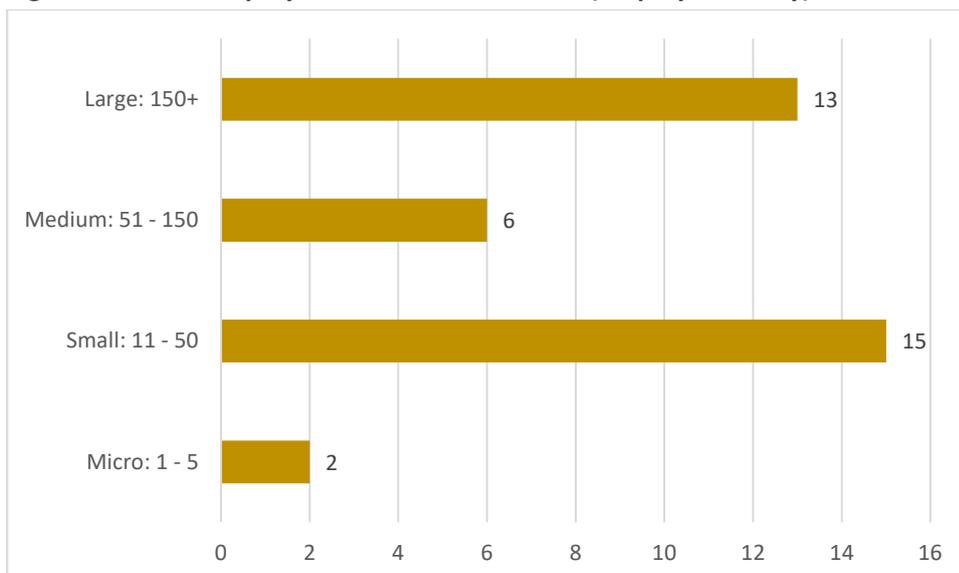


Source: merSETA Employer Database

Figure 2 gives a statistical breakdown of the size of businesses in the MerSector. As shown in the figure, numerically, small companies comprise of 1128, out of 1206 total number of all businesses. 65 employers had 50-149 employees, while 13 employers had more than 150 employees. The results from the employer survey also proves that this sector is dominated by small businesses. This is a challenge for the sector because it limits opportunities for learnerships, internships, employment and training as these small employers stated in the interviews that they cannot afford to train as well as hire qualified employees due to lack of finances.

The results of the employer electronic survey as seen in figure 3 show a larger ratio of big employers than reflected in the merSETA employer database. There is probably an overestimation of large employers in the employer survey because larger companies are more likely to have HR capacity to respond to survey questionnaires than smaller companies.

Figure 3: Size of employers in the formal sector (employer survey) -North West



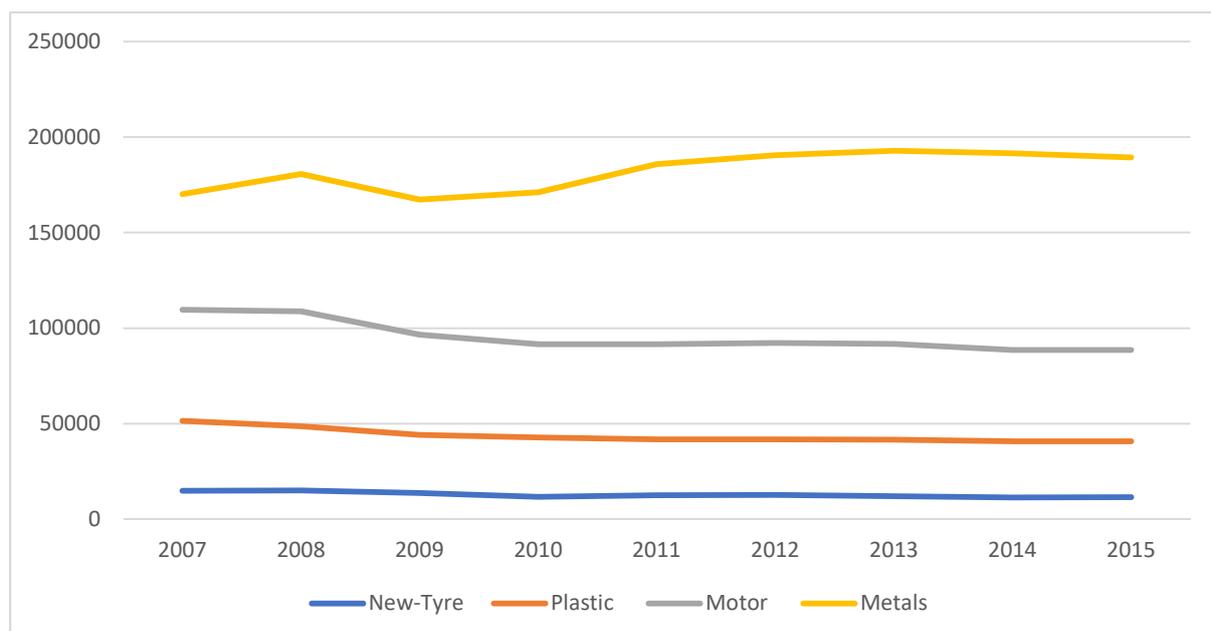
Source: merSETA Employer survey

Changes in employment

The North West Province currently has a population of 3,9 million (Statistics South Africa 2018 & Poverty Trends Report 2017). Out of this population, 39,0% of the working age (15-64 years) were employed in the first quarter of 2018, while 41,8% of the same age were unemployed in the same period (Quarterly Labour Force Survey, Q1: 2018).

Figure 4 indicates that as the biggest MerSector employer in the North West, metals, had employed approximately 189 269 people in 2015. This chamber experienced a decline of 2305 employees between 2014 and 2015. The motor sector also experienced a decline during this period. While, the two smallest chambers in the sector (plastics and new-tyre) were the only sectors that had an increase in the number of employees in this period. On the whole, total employment in the sector reflected a decline, dropping from 353 194 of total employment in 2008 to 330 469 of total employment in 2015. Sector stakeholders indicated that job losses were as a result of their businesses not being able to increase both their output and revenue.

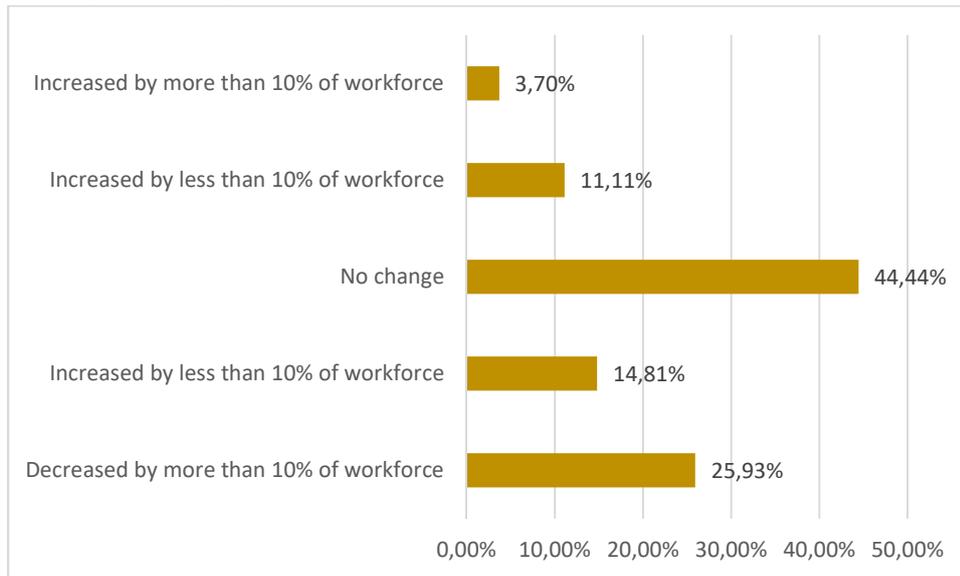
Figure 4: Changes in employment



Source: Quantec

In the employer survey, employers were asked whether their company had increased or decreased the number of full-time employees in the past. The results show that of the 36 respondents, 44% have not been shedding any jobs or hiring any new people. So, their employment rates have been constant over the years. Just above a quarter (26%) of the employers had decreased their workers by more than 10% of the workforce in the past. An alarming factor from these results is that only 4% of the employers were able to increase their employees by more than 10% of the workforce while, 11% of the employers increased their workforce by less than 10% in the same period (Figure 5).

Figure 5: Indication of whether the company has grown or decreased the number of full-time employees in the past.



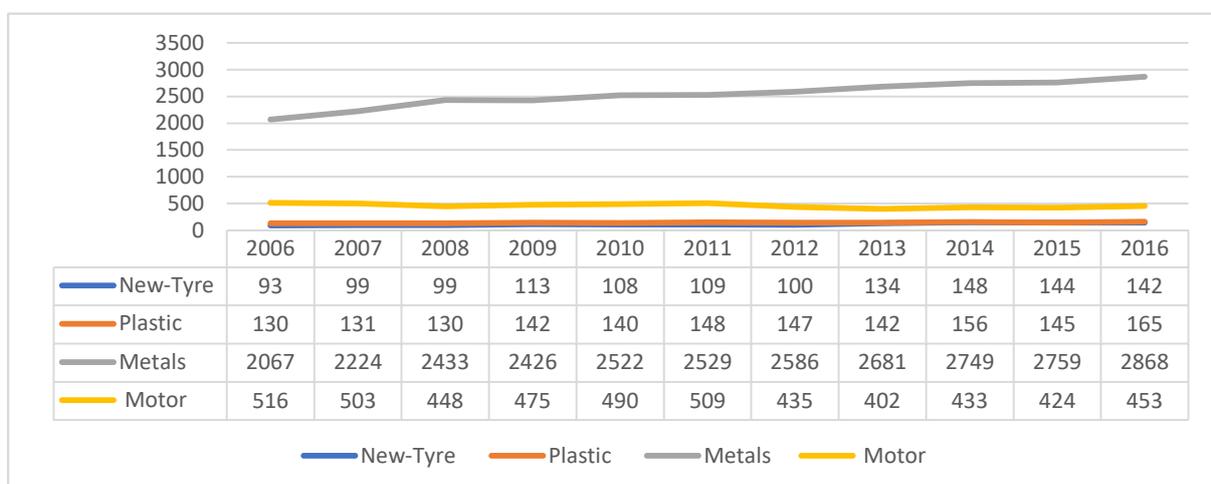
Source: merSETA Employer survey

c. A statistical breakdown of economic performance

The North West economy heavily depends on platinum mining, with limited agriculture, construction and manufacturing. According to the North West provincial review (2016), manufacturing has been struggling in the province. This has led to the mines having to depend on other companies outside North West for assistance. The report reveals that mining contributed about 30% to the provincial economy, followed by manufacturing at 5%, agriculture at 2%, and construction at 2%.

Figure 6 reveals a generally stable trend in output for merSETA chambers in the province between 2006 and 2016. The metals chamber, however, has been experiencing an increase in output since after the 2008/09 global recession.

Figure 6: A breakdown of output per chamber (2006-2016) North West

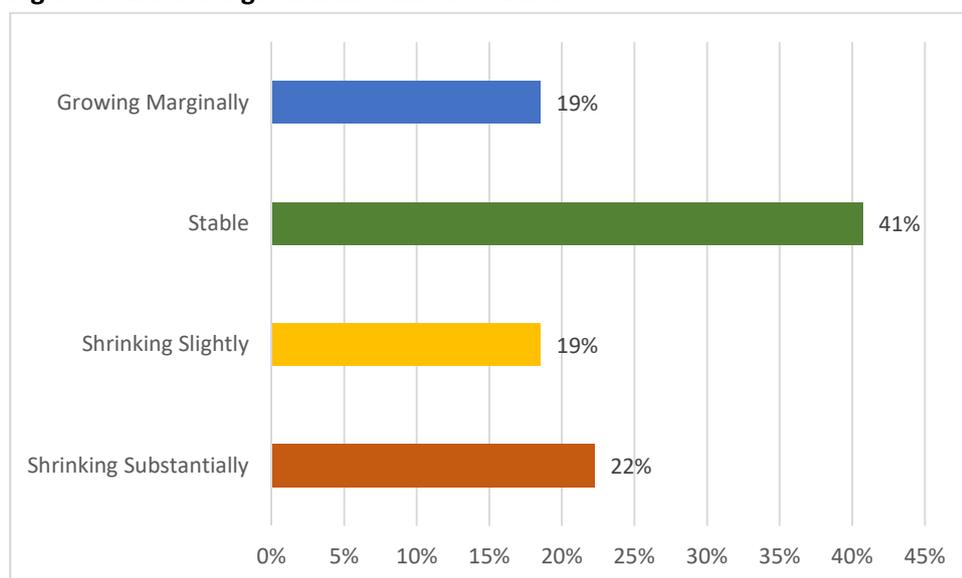


Source: Quantec

Based on the employers interviewed for the study, most of the businesses under this sector are SMMEs and their employees do not have the required skills and qualifications for the work they are expected to do. The employers also raised the fact that as SMMEs they are unable to recruit highly qualified and skilled people because of financial constraints. Therefore, they are unable to afford them.

The survey conducted with employers for the study also revealed that 41% of the 36 employers reported a stable growth in terms of their revenue. While, 19% reported that their business revenue was growing marginally, 19% reported a slightly shrinking revenue and 22% reported a shrinking revenue. It is also important to note that none of the employers saw substantial growth in their business revenue. Their revenues were either growing marginally, slightly shrinking or stable, as seen in figure 7.

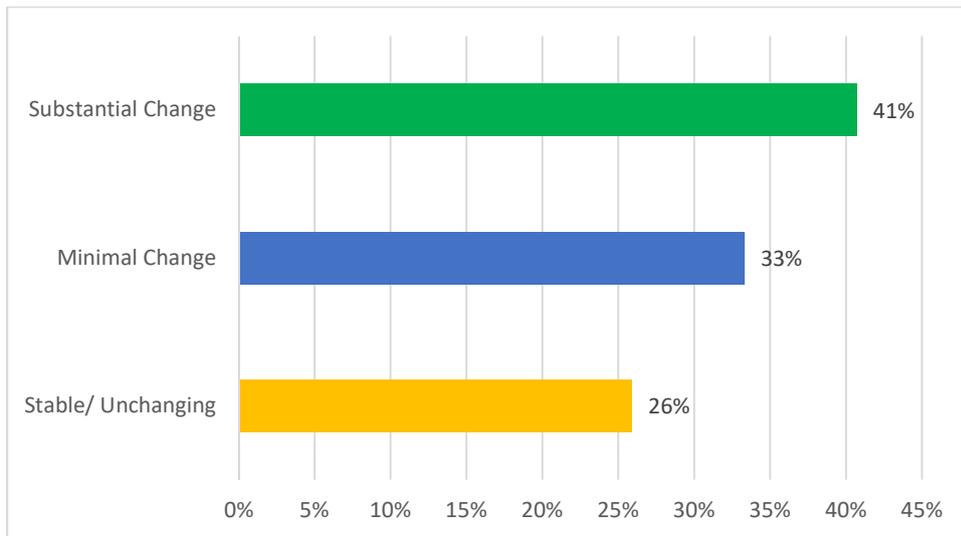
Figure 7: Business growth in terms of revenue



Source: Employer survey

The survey further shows that most employers in the sector (41%) experienced substantial change in the operation of their businesses. As compared to those who experienced minimal change (33%), and those who didn't experience any change (26%) in their business operations (see figure 8).

Figure 8: Experience of operational change in the business



Source: Employer survey

d. Skills Demand

It is important to state that based on the interviews conducted with employers in the sector, it is evident that there is no general agreement about what hard to fill vacancies are in this sector. Employers generally have different perspectives of what vacancies are hard to fill in their companies. The research reveals that amongst other factors, based on whether an employer is an SMME or a large company the hard to fill vacancies list differs.

Employers in all chambers tend to want more artisans and high-end skilled employees. Those in the motor chamber seem to have more qualified artisans who are mechanics and millwright. However, it looks as if in all these chambers a majority of their employees are either apprentices or general workers such as machine operators, manual workers, administrators and cleaners who are low-skilled workers.

Hard-to-fill-vacancies from the employer interviews

Based on the employer interviews, employers in the motor and metals chamber reported that they find it difficult to fill positions for sales people. They state that, most people from this sector tend to want to work only in the technical side of the business than doing sales. Other hard to fill vacancies in this chamber are artisans. A Majority of these companies are SMMEs and they are unable to afford artisans because they are expensive. “We find it difficult to recruit artisans because they are expensive. We end up having to negotiate the salary with them until both parties are satisfied”, says an employer in the motor chamber.

The metal and plastics chambers find it difficult to get welders, engineers, tool makers and robot technicians. They normally just to take their existing staff for training in order to acquire these skills.

According to an HR manager at MPACT Plastics, “the most difficult jobs to fill in our company are in the engineering side, these jobs include tool-making and robot technicians”. “We have a contingency

plan to mitigate the difficulty, in the past two years we had two employed graduate engineers and we are currently training them in processing”.

Hard to fill vacancies from the employer survey

Motor

Diesel Mechanic	44,44%	4
Tractor and Truck Mechanic	33,33%	3
Forklift & earthmoving	33,33%	3
Retail Store Managers with experience	22,22%	2
Automotive Electrician	11,11%	1

Reasons given in the survey who vacancies are hard to fill:

- Qualified and skilled people are hard to find
- No public interest / qualifications to enter trade
- Salary scales are out of line
- Qualified diesel/petrol mechanics are hard to find.
- There are no quality spray painters in our area
- BEE reasons and the fact that the business is in a rural location
- There are no quality panel beaters in our area
- Poor education, lack of experience and disciplined people

Plastics

HTFV	Responses		Reason
Plastic Welder	33,33%	1	It is not a general trade

Metals

Boilermaker	29,41%	5
Fitter and Turner	17,65%	3
Welder	11,76%	2
Refrigeration Mechanic	11,76%	2
Earthmoving Equipment Mechanic	11,76%	2

Reasons given in the survey who vacancies are hard to fill:

- It takes long to qualify, and the SETA's processes are too troublesome
- Lack of skills and experienced individuals
- Remoteness of area in which the business is located
- It takes long to qualify for a trade and the SETA`s processes are too troublesome
- Finding Competency, and experienced people are difficult to find
- There is not a lot of riggers in the market and those who are in the market want high salaries

Skills changes

As more technology is introduced in the industry, employers find that they have to constantly train their employees. The training is either through venter training, formal training or on-the- job training. One employer from the motor chamber says, skills have changed in his company. This is because, in the past, employees had to put in a lot of physical effort in the workshops. However, in the current age it is 90% technical and only 10% of physical effort required. Another employer in the motor chamber says he has introduced electrical cars in his company, so technicians that are not electrically inclined would struggle because these cars will need people with electrical skills to work on them. “If you can’t understand how electrical cars [electrics in the car] work you will struggle at our company because technology plays a critical role in everything we do. You need to know how computers work”.

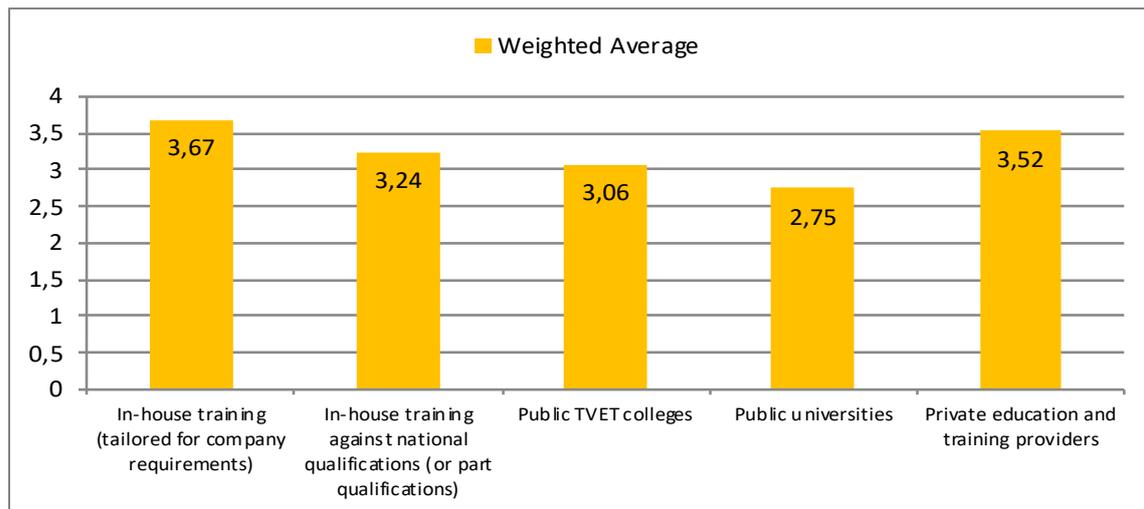
A service manager at BMW says, “our company introduced machines that detect faults in a car by simply scanning the key”. The company currently provides training to their employees for this machine. Other employers say things have become challenging with the advent of new technology. Therefore, as a result of this tremendous change, they will have to spend a lot of money in training people for these new machines. However, they project that these changes will not displace labour. “What we have done was to put measures that helped people to produce within the realm of new technology without shedding staff”.

According to an employer in the motor chamber, there are changes coming and this has already started. “For example, today we talk green economy in the motor industry, so changes will impact heavily on skills requirements and we should be ready for these anticipated changes. I think technology is already here hence our company had undertaken to initiate and train us in various courses. For instance, our technician is 55 years old, but he is still undergoing training to cope with the changing skills demands”. The employers believe that our country is heading for serious technological growth. Skills will be more refined and sophisticated, and this will require serious adjustments to the way people are trained.

e. Skills Supply

The research study has found that skills formation within the sector is mainly through in-house training (69%) and private training providers (69%). Only 19% of employer respondents rely on public universities and TVET colleges for training. Half of these employers believe they have sufficient accredited training providers close to their business operations with 62% of employers believing that the training provided is of good quality.

Figure 62: Rating of training quality by employers in North West



Source: MerSETA survey of employers, 2018

Employers have more confidence in their inhouse training as well as private training providers, having rated them both above average with average scores of 3.67 and 3.52 respectively. Public universities have been rated below average with a score of 2.75 whilst public TVET colleges is considered average with a score of 3.06. About 44% of employers do not believe they get good quality graduates from the public universities.

In interviews, employers in plastics and metals seem to prefer training their staff formally through accredited training providers. While a few in the motor chamber say it depends on the situation and the need. So, based on these factors they choose whether to train formally, informally or on-the-job. Training in this sector ranges from a variety of short-term and long-term courses. Short term courses are normally for a week while long-term courses are for over one month.

An employer from the plastics chamber says, “we have our preferred provider and training is done inhouse. We have spent our own money and have not been funded by the SETA. We have spent around R180 000 on training”.

Another employer in the metal chamber explained that they also have a training provider who comes on site to do the training. The company also pays for their own training as they don’t receive funding from merSETA. According to the employer the duration of the training ranges from 3 months, 6 months to a year, and they spend over a million on training.

Lastly, an employer in the motor chamber states that their company has a training centre where they train their employees, and that they also pay for their own training. The company does not receive funding from merSETA. This company normally train their employees for a week and this would cost around R3 500 per course.

According to the training providers employers mostly demand training for boilermakers at level 2-4 NQF, electricians, as well as fitters and turners. Small companies will demand more training than large companies because they don’t have the capacity and capital to train their own employees. Another provider said the same thing “the big companies train their own people and we train people for small

companies". As one of the TVET colleges, Orbit says, "we do a lot of practical work in the workshop, so that before they go to the workplace they already know what a workshop looks like".

Training challenges and successes

According to the employers, logistics and finances are some of the challenges they face with training. Employees normally have to travel long distances to get to the training centres and sometimes getting them there is a challenge. Financing the training is also a challenge in the sector. "Although we always want to train our employees to improve their skills, access to funding is a nightmare", says an employer from the metal chamber. Fortunately, the employers state that training doesn't disrupt production because training is normally scheduled during quiet times to minimise disruptions, so this doesn't affect production.

Despite these challenges, employers were generally pleased with the training their staff receives. The employers believe that training improves the skills of the employees as well as their pace, especially those in the workshops. "Training is a worthy cause indeed, it is excellent and of a high standard" said the employer.

f. Conclusion

Based on the findings presented in this report one of the main drivers for skills in the province is technology. Technology is taking the sector by storm. Companies are producing machines that can detect faults in cars. Nevertheless, it seems as if employers in this sector are ready and are adapting to the change. This is because employers tend to train their employees constantly as technology changes in the sector. The training providers also seem to be ready and on the lookout for new technological programmes.

Employers in this sector mostly demand employees that are technologically inclined, artisans, and people skills such as customer services and problem-solving skills. Although the big employers in the sector have their own training centres where they train employees, the small companies tend to train employees through public and private training providers.

In conclusion, it seems as if most employers that were interviewed and those that took part in the employer survey, were not being funded by MerSETA for training. These employers tend to fund their own training because of the long processes that they have to go through to apply for funding from the SETA. MerSETA must come up with processes that will be less difficult and time consuming for the employers.