Connecting the dots in the mer sector

Research highlights and insights (2017-2020)

merSETA

MANUFACTURING, ENGINEERING
AND RELATED SERVICES SETA

LEADERS IN CLOSING THE SKILLS GAP

Vision

Leaders in closing the skills gap

Mission

To increase access to high quality and relevant skills development and training opportunities in order to reduce inequalities and unemployment and to promote employability and participation in the economy.

Table of Content

List of acronyms

4IR	Fourth Industrial Revolution
ATR	Annual Training Report
BEE	Black Economic Empowerment
BI	Black Industrialist
CCMA	Commission for Conciliation Mediation and Arbitration
DBE	Department of Basic Education
DHET	Department of Higher Education Training
DoL	Department of Labour
DTI	Department of Trade Industry and Competition
ERRP	Economic Reconstruction and Recovery Plan
GDP	Gross Domestic Products
HEQSF	Higher Education Qualification Sub- Framework
HTFV	Hard To Fill Vacancies
HRDSA	Human Resources Development South Africa
ICT	Information and Communications Technology
IPAP	Industrial Policy Action Plan
LMIP	Labour Market Intelligent Partnership
MTSF	Medium Term Strategic Framework
NAMB	National Artisan Moderation Body
NDP	National Development Plan
NEDLAC	National Economic and Labour Council
NGO	Non-Governmental Organisation
NIH	Nehawu Investment Holdings
NOCC	National Occupational Curriculum Content
NSDP	National Skills Development Plan
NSDS	National Skills Development Strategy
NSF	National Skills Fund
OEM	Original Equipment Manufacturer
OFO	Organising Framework for Occupations
PPE	Personal Protection Equipment
PSET CLOUD	Post School Education and Training Collaboration and Learning Opportunities and Utilisation of Data
QCTO	Quality Control for Trader and Occupations
RAP	Retrenchment Assistance Programme
RPL	Recognition of Prior Learning
SAAM	South African Automotive Master plan
SAQA	South African Qualifications Authority
SEDA	Small Enterprise Development Agency
SEED	Strengthening Entrepreneurship and Enterprise Development
SEIFSA	Steel and Engineering Industries Federation of South Africa
SETA	Sector Education and Training Authority
SEZ	Special Economic Zone
SIPS	Strategic Integrated Projects
SMME	Small Medium and Micro Enterprise
STEM	Science Technology Engineering and Math
SSP	Sector Skills Plan
TLS	Training Layoff Scheme
TVET	Technical Vocational Education and Training
UIF	Unemployment Insurance Fund
WBL	Workplace Based Learning
WFH	Work From Home
WIL	Work Integrated Learning
WSP	Work Skills Plans

Foreword from the merSETA CEO

This research booklet comes out at a unique time, a time where significant disruption brought on by the COVID-19 pandemic is evident in the manufacturing, engineering and related services (mer) sectors. This disruption is also evident in the Post School Education and Training sector where a number of unique challenges require thought and attention to find solutions. The South African economy is looking for robust innovation and change to keep up with the new normal. This is an exciting time that requires the merSETA to think "outside the box" as we work towards finding solutions. For this to be possible, research at the merSETA needs to play a critical role in guiding skills development interventions and policy direction.

Looking back over the last 4 years, there has been a number of significant changes in the economy and PSET system, with increasing focus on evidence-based decision making and reliance on data.

Research completed by the merSETA between 2017 and 2020 tends to cluster around the following thematic areas:
- Future Focus
- Transformation in the mer sector
- Social Economy
- Evaluation of merSETA initiatives and programmes
- PSET Insights

Looking ahead, merSETA will focus on aligning with national interventions to reduce the impact of the COVID-19 pandemic, while also focusing on emerging themes deemed important for the sector. In order to successfully do this, the merSETA is aligning with the Economic Reconstruction and Recovery Plan (ERRP) in the following ways:
- Assist the prevention of further job losses: through the exploration of partnerships with other SETAs, particularly in the goods cluster

Mr Wayne Adams: The merSETA CEO

to identify cross cutting skills priorities
- Ensure a deep understanding of the challenges faced by sectors: conducting research to understand challenges confronting the sector.
- Align to the skills and innovation strategy: through innovation from a number of merSETA projects and programmes, while strongly focusing on a renewed approach.
- Paying attention to youth, women and vulnerable groups: the merSETA has put in place targets and will continuously review to ensure these are aligned to the national policy.
- Insure inclusivity and promote fair access to training opportunities: addressing inequalities by ensuring the participation of people from marginalised communities and supporting structural transformation.

The merSETA, under the guidance of the Strategy and Research Executive Ms. Sebolelo Nomvete and her experienced team of researchers along various partnerships, has generated significant knowledge in the skills development space. It is our sincere hope that our various stakeholders including policy makers, industry and academia will continue to tap into this rich pool of knowledge.

Positioning research in the merSETA

Introduction

Research has become an important practice within the merSETA. The role of research has cascaded into almost all units of operation within the organisation from a monitoring, impact assessment, partnership, strategic intent and indeed the skills planning perspective. It is evident that through the Strategy and Research Division the importance of informed decision making has taken on a stronger role in defining how we do what we do at the merSETA. The strategic underpinning of the SETA is informed by credible information and knowledge. This wealth of information and knowledge is garnered through projects' development, skills planning, monitoring, evaluation and partnerships – all informed by rigorous knowledge practices and quality management systems.

The merSETA has growing reputation in the academic space, and the very notion of research has become entrenched in the organisation. Over the years the projects and partnerships we have undertaken have informed the trajectory of the research, and in a number of cases has led to the implementation of relevant and impactful projects and programmes within the skills development arena. The first research booklet was published by merSETA in 2013. It demonstrated the need to highlight research undertakings which had relevance to the skills development eco-system, with a particular focus on the technical, vocational education, and training (TVET) sector. A further research booklet was published in 2016, which focused on a number of evaluation and tracer studies, as well as summaries of number of chamber focused research projects. Building on this, this current research booklet gives a high-level summary of some of the significant findings from our research projects between 2017 and 2020.

Since 2013, the merSETA has invested efforts in increasing its internal research capacity, strengthening partnerships, and putting more emphasis on impact, quality, competence assessment, monitoring, and tracking. The organisation has realised the importance of data and data management, as well as producing knowledge and harnessing skills to analyse and critique data and information. The role of data and the need for data-driven decision making has been placed at the forefront of merSETA's agenda internally and outwardly in the larger PSET environment. Currently, data in the education and training sector at large has great potential to further strengthen strategic decisions but requires integration - to this end the PSET Collaboration and Learning Opportunities and Utilisation of Data (CLOUD) project has the potential to make a significant impact in the integration of data amongst all PSET institutions.

This research booklet has 3 main objectives: Firstly, it seeks to highlight the research projects completed between 2017 and 2020. Secondly, to give an indication of the anticipated role research will play in the mer sector, particularly in regards to future trends and the 4th Industrial Revolution (4IR). Lastly, it aims to demonstrate the merSETA's efforts to use research to close the skills gap.

Situation Analysis

At this point in time, the merSETA finds itself operating in the midst of a pandemic. The mer sector is still grappling with the accelerated onset of technological change and new business operations driven by the pandemic. Disruptions, however, also create opportunities for innovation. The so called new normal has given many an opportunity to re-assess what is possible. It is exciting on the one hand, in that the Post School Education and Training sector has had to respond through the accommodation of new practices and norms. The sector is seeing real development in terms of implementation of the White Paper and the National Skills Development Strategy (NSDS), as well as positive enhancements in our understanding of the needs of a dynamic labour market. On the other hand, the sector's current context in terms of the economic climate demonstrates the significant impact of the global halt in manufacturing due to the pandemic and the challenges facing the manufacturing sector. The number of employees in the sector has decreased, along with vacancies in the sector, and some of

our stakeholders have indicated the potential of further retrenchments and head-count freezes to be implemented in the coming financial year.

These trends do not bode well for our sector, and will further contribute to national levels of joblessness and economic uncertainty. This poses challenges for SETAs in terms of securing workplaces to meet their mandate under the current NSD Framework. This is compounded by the fact that our sector has continually seen a decline in traditional manufacturing production in favour of automation. These trends indicate that small and medium businesses, as well as informal sectors, will become key components for employment opportunities – as well as skills development opportunities going forward.

Currently, the merSETA is mandated under the Skills Development Act no. 97 of 1998, to train and develop the current workforce, and to make provision for the training of new entrants into the workplace. The merSETA does this under the guidance of the NSDS; which is informed and guided by other overarching government programmes that support the National Development Plan. These include the following:
• the Human Resources Development Strategy for South Africa (HRDSA II);
• the National Development Plan;
• the New Growth Path;
• the Medium Term Strategic Framework (MTSF);
• the National Skills Accord;
• the Industrial Policy Action Plan (IPAP);
• the Department of Trade and Industry's Special Economic Zones (SEZ) policy;
• the Economic Reconstruction and Recovery Plan; and
• Various sector master plans.

Under the NSDS, the merSETA operates as an intermediary between business, labour, the South African Government and PSET Institutions. The White Paper on Post School Education and Training, along with the later NSDS have made prescriptions on the role of SETAs, and the role of research within SETAs, to support skills development. According to the White paper, SETAs form part of the post schooling system that supports the education and training process, along with other bodies such as the National Skills Fund (NSF), the South African Qualifications Authority (SAQA) and Quality Councils.

According to the White Paper, the challenges facing the Post School Education and Training (PSET) system include the following:
• Mismatch between the supply and demand side;
• High rates of youth who are not in education, training or employment;
• Lack of diversity and transformation within the system with respect to demographics, curricula and culture;
• Challenges posed by social issues such as poverty, unemployment and inequality; and
• Weak data collection and analysis.

The aim of the PSET system is to create a collective, synergised and coordinated education and training system that is highly articulated and mutually beneficial for its diverse stakeholders. It also aims to substantially increase headcount in terms of enrolments and graduations at education institutions, and to increase the quality of outputs entering the market place. Under the PSET system proposed by the White Paper, SETAs have two main functions. The first is to focus on developing the skills of the employed population, and to develop a pipeline of skills into the workplace. Secondly, SETAs will need to focus on quantitative and qualitative data collection in accordance with the requirements of the proposed centralised skills planning unit within the DHET. Further to this, SETAs need to engage stakeholders to test emerging scenarios from within the central planning mechanism. SETA data would thus compliment national data systems such as Statistics South Africa (StatsSA), the Labour Market Intelligence Partnership (LMIP), and other government departments.

It is thus imperative that the merSETA aligns its research, to feed into the PSET system as proposed. In this light the research should focus on the following:
• Continuing and enhancing knowledge of the manufacturing, engineering, and related services sectors;
• Focusing efforts on the provision of accurate, representative data for the required sectors;
• Ensuring adequate research capacity or management of the research process;
• Brokering partnerships with key educational institutions and employers to facilitate training that is required by the sectors (currently and in the future);
• Advocating for workplace learning that is mutually beneficial to the learner and the employer; and

- Continued monitoring and understanding of the labour market, in terms of labour absorption, and opportunities for entrepreneurial efforts and training.

Overall, through the White Paper, the DHET and all PSET institutions need to work together, with the aim of transforming the post school system in line with the principles of social justice and equality. There is also an emphasis on providing quality training to produce quality labour market participants in areas that are needed by industry.

Research agenda

A fundamental principle governing all research undertaken by the merSETA is that it should link to operational requirements, the broader skills development landscape, the Technical & Vocational Education and Training (TVET) community, and feed into sector skills planning. The merSETA sectors and sub-sectors (classified collectively in the SETA as Chambers) have become a focus area for targeted research interventions considered by stakeholders to be particularly significant. Chamber level engagement with stakeholders is therefore central to the research strategy. In addition, engagement with regional stakeholders features as a significant part of the research strategy.

Furthermore, there is an ever-increasing effort to incorporate the notion of impact as part of the overall approach, along with greater interrogation of available data and information. Overall, the research strategy is executed through organisation-wide efforts; however, the Strategy and Research Division within the merSETA is at the forefront of research collaborations, partnerships and projects, as depicted in Figure 1 (below).

The team is comprised of multi-disciplinary competencies, and is organised into two inter-related functional units, which include: the Strategic Planning Unit, and the Applied Research and Innovations Projects Unit (which incorporates the Chambers Unit). Through these units, the merSETA has continued to participate and contribute to the overarching objective of establishing a "Credible Institutional Mechanism for Skills Planning", through informed decision-making, sound research methodologies, and reliable information and data. In addition, the SETA

participates in national initiatives such as the Post-School Education and Training Research Forum, planning for Strategic Integrated Projects (SIPS), and the Labour Market Intelligence Partnership's (LMIP) workshops and policy round-tables. The merSETA uses these platforms to engage on skills development issues at the policy-, strategic- and national level.

Overview of research within the strategy and research division of the merSETA

One of the key functions of the Strategy and Research Division within the merSETA is research. The outcomes and findings of the research undertaken at the merSETA plays a vital function for the alignment of merSETA's strategy and projects with national and sector priorities. The Strategy and Research Division consists of: the Strategic Planning Unit and the Applied Research and Innovation Projects Unit (incorporating the Chamber Unit). The Strategic Planning Unit houses a number of sub-units namely: Labour Market and Sector Skills Planning Unit, Knowledge Management Unit, Monitoring and Evaluation Unit and Quality Management Systems Unit. The units within the Strategy and Research Division have a considerable role to play in conducting research as well as the communication of the findings with the relevant stakeholders. Below is a summary of the units and functions that are involved with research as well as a brief outline of the types of research projects undertaken.

Labour market & sector skills planning unit

The overarching objective of the Labour Market & Sector Skills Planning Unit is to establish a Credible Institutional Mechanism for Skills Planning through informed decision-making, sound research methodologies, and reliable quantitative and qualitative data. The Labour Market and Sector Skills Planning Unit work in partnership with the Chamber Unit, in an attempt to gain credible data from industry, which are used to inform the merSETA's national Sectors Skills Plan.

Knowledge management unit

The Knowledge Management Unit is situated within the Strategic Planning Unit. This function is responsible for the efficient and systematic management of knowledge generation, organisation, storage, sharing and use to add value to the core business of the merSETA. A
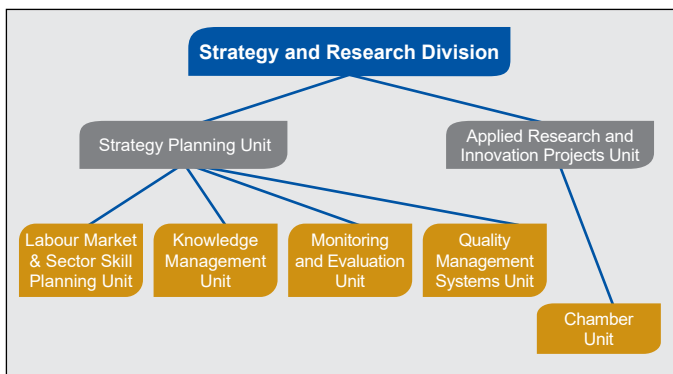
Figure 1: Strategy and Research Division

key component of this function is the facilitating of storage and distribution of research within the merSETA. The Knowledge Management Unit is also responsible for conceptualising and managing a number of strategic research projects.

Monitoring and evaluation unit

The Monitoring and Evaluation Unit is located within the Strategic Planning. Some of the key responsibilities assigned to this unit include: collecting quantitative and qualitative performance information from various divisions within merSETA, evaluation of key merSETA programmes, as well as the co-ordination of performance information required for audit purposes. The Monitoring and Evaluation Unit co-ordinates a number of evaluation research projects, to ensure continuous learning and improvement of key strategic programmes.

The applied research and innovations projects unit

The Applied Research and Innovations Projects Unit manages partnerships between merSETA and key organisations. Partnerships play a pivotal role in strengthening skills development interventions by creating and strengthening synergies among players in the skills development eco-system. The merSETA has a range of partnership agreements with TVET colleges, local and international universities, and universities of technology, as well as national and provincial governments. A key objective is to support employability and contribute to the professional development of TVET educators. Several of the partnership agreements also aim to strengthen the South African TVET College system through the introduction of teaching and learning methodologies to prepare the learners more effectively for the workplace. The Applied Research and Innovations Projects Unit facilitates this process, and monitors progress from start to end.

Chamber unit

The Chamber Unit works alongside the Applied Research and Innovation Projects Unit. This unit serves as a liaison structure between the organisation and its six Chamber Committees (Metals, Automotive Manufacturing, Automotive Components Manufacturing, Motor Retail, New Tyre Manufacturing and Plastics). The Chamber Unit is further responsible for providing ongoing secretarial and administrative support for Chamber Committees to fulfil delegated functions prescribed by the Accounting Authority. Along with these functions the Chamber Unit is also responsible for co-ordinating the research and innovation projects within the Chambers, which accounts for a considerable proportion of the research conducted in the merSETA. The merSETA annually avails funds to all Chambers to complete research they deem vital to their sector.

merSETA's partnerships

The merSETA has put in place various strategies aimed at supporting the establishment of new partnerships. These are informed by government's Economic Reconstruction and Recovery Plan (ERRP) and its related skills strategies and Sector Master Plans (Plastics, Steel and Automotive sectors). These have informed the strategic focus on the development of the social economy, green economy and circular economy; the development of Black Industrialists; and other national and sector priorities such as transformation, youth development and inclusive economic growth.

To date, the merSETA has entered into many partnership agreements to support its mandate within its key strategic priority areas, these include and are not limited to partnerships with:

• National and Provincial government departments;
• Higher Eductiion Institutions including both public universities and universities of technology;
• Research partnerships with public and private research institutions; and
• TVET College partnerships

Result of partnerships that have yielded tangible returns in the skills development arena. These include efforts to support teaching and learning at TVET Colleges; brokering relationships between the education sector and the private sector; improving
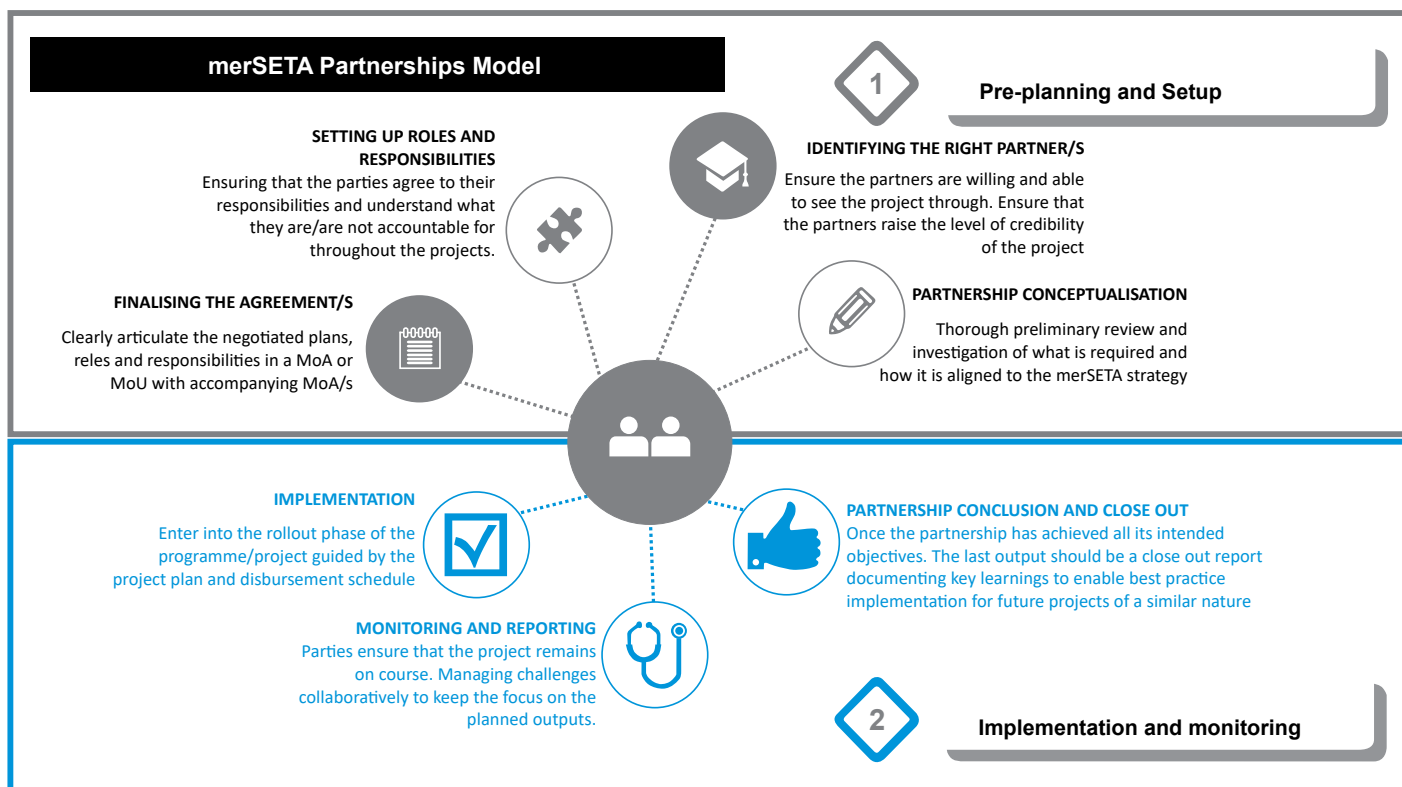
Figure 2: merSETA Partnership Model

the quality of teaching and learning; and increasing learner success rates.

To improve the success of merSETA's partnerships, a partnership model (Figure 2, below) was developed that demonstrates the best practice findings, which have been incorporated into a basic model for partnerships. It comprises two parts with the majority of the effort assigned to the pre-planning and setting up phase. Once all the groundwork has been laid in terms of planning, the implementation and monitoring phase ensures that the partnership adheres to the agreed roles, objectives, accountabilities and outputs until the partnership is concluded.

Principles guiding all merSETA's research and thematic focus

A fundamental principle governing all research undertaken by the merSETA is that it should link to operational requirements, the broader skills development landscape, the Vocational Education and Training (VET) community, and feed into the Sector Skills Plan. The mer sectors and sub-sectors (classified collectively in the SETA as Chambers) have become particularly significant as a focus area for targeted research interventions considered by stakeholders to be important. Chamber level engagement with stakeholders is therefore central to the research strategy. In addition, greater

engagement with regional stakeholders will also feature as a significant part of the research strategy going forward. Furthermore, there will be increased efforts to incorporate the notion of impact as part of the overall approach, along with greater interrogation of available data and information. The value proposition of research assignments is that they should strive to provide quality research outputs in support of merSETA vision; aspiring to be "leaders in closing the skills gap".

The merSETA research themes are scoped for functionality and intrinsic value: functionality for a particular purpose within the merSETA mandate, and intrinsic value for relevance in terms of the national skills development imperatives. As the merSETA has evolved, it has become evident that in order to do justice to the Research and Development initiatives on sills development, a futuristic approach needs to be taken. Therefore, all upcoming research topics should be "future orientated" and address one or more of the following strategic challenges:

- Economic recovery and re-industrialisation (in response to the Economic Reconstruction and Recovery Plan)
- Transformation in the mer sector
- Future skills, practices and technologies
- Green economy
- Social economy

Transformation

Skills development and employment of people living with disabilities

Purpose

The purpose of this evaluation research was to collect and collate data and information to provide valuable insights towards the improvement of merSETA's skills development facilitation. The study evaluated the status of skills development for formal employment of people with disability.

This research was a response to increased focus on transformation in the labour market in the South African legislation, emanating from the National Skills Development Strategy, the Employment Equity Act and the Broad-Based Black Economic Empowerment Act.

The overall aim of the evaluation was to examine the impact of merSETA's Disability Project on learners, employers and training providers, and to make recommendations in terms of skills delivery, curriculum and learning conditions within companies.

Research methodology

The methodology used consisted of both qualitative and quantitative approaches. The quantitative data was collected from reports provided by the merSETA reflecting data in terms of the numbers of beneficiaries and activities implemented. This quantitative data was triangulated with the qualitative data collected from participating training providers and employers.

The participating organisations involved in the evaluation were located in six provinces including, Western Cape, Northern Cape, Eastern Cape, Free State, Kwa-Zulu Natal and Gauteng. The participating organisations were broadly classified as non-governmental organisations (NGOs)

(disability-specific and mainstream), skills/special schools, and merSETA corporate partners. For interviews, semi-structured interviews were primarily conducted face-to-face with participants.

Focus groups were also utilised mainly to engage with persons with disabilities that participated in the merSETA skills and learnership programmes.

Key findings from participating organisations

A number of challenges were experienced by the organisations participating in this research. These have been categorised under the following: challenges and experiences relating to the individual learners with disabilities, challenges the companies had to overcome and challenges companies experienced when dealing with the merSETA and their systems and processes.

Below is a list of challenges companies experienced with the learners with disabilities:

- Some of the learners were reluctant to be open about their disability, even though confidentiality was promised.
- Emotional and social support in the learnership structure was needed, due to the challenges these learners dealt with.
- Some of the challenges experienced were with the learners' level of numeracy and literacy, and in some cases, the general lack soft skills of the learners (time management and communication). It was suggested that learnerships for persons with disabilities need to include extra topics such as computer literacy, financial planning and workplace soft skills.
- Transport in general is a considerable challenge,

both for the day students coming to campus from home (depending on their disability, some required specialised transport).

- It was difficult to get some learners into the learnerships with disability programme as some potential candidates from rural areas did not have the required documentation (school reports and identity documentation).
- Many persons with disabilities were also on chronic medication, requiring proper management of their funding, social workers may be required to assist.
- One of the positive outcomes of this programmes was that the learners experienced an increase in self-esteem through the completion of this programme, which impacted on the positivity of their attitude and sense of accomplishment.

Some of the experiences shared and challenges with the organisations that were training the learners included:

- Some organisations did not have experience with accommodating people with disabilities, they had to 'learn by doing'. Mental disabilities were found to be especially challenging (for example, bi-polar), as they did not have any experience with these.
- Initially, there was resistance from Line Managers working with the disabled learners as they did not see the possibility of incorporating these learners in the workplace. This resistance had to be dealt with in a constructive manner.
- Socio-economic circumstances had a considerable effect on the learner's performance and ability to complete their work, as some of them had problems at home which would affect them in the workplace, this also attributed to high absenteeism.
- Testing the learners was sometimes problematic, one organisation gave their disabled learners the option to do either written or oral tests.
- The dropout rate amongst the learners with disabilities were higher than normal. One organisation countered this with an initial intake of learners that was more than stated in the MoA with the merSETA.

- It was difficult for some organisations to find learners with disabilities, who fulfil the required criteria.
- Communication challenges were experienced, one organisation separated their learners with hearing disabilities to give them training in sign language.

The following findings are related to the merSETA and their systems and processes:

- The merSETA was unable to clearly define what a disability was, the guidelines were not clear, leaving room for interpretation.
- Funding from the merSETA did not cover all the costs of the learnerships, as extra emotional and social support from external service providers was required.
- The relationship between the institute's coordinator and the merSETA Provincial Client Relations Officer was found to be very good.
- It was found that the general SETA funding processes were a challenge, as delays were experienced in receiving funding, and the application windows were a challenge as they left gaps between funding allocations.
- The merSETA's guidelines on disability learnerships were found to be missing.

Recommendations

The research conducted shows room for a number of improvements and a strong recommendation has been made to review the Disability Project at an internal strategic level by reviewing the project strategy and approaches.

The merSETA needs to focus on building relationships with partners which go beyond grant disbursement, management and monitoring, and therefore beyond how the current grant system is structured.

Considering the context in which the Disability Project is situated, and the challenges and barriers faced by persons with disabilities, the merSETA needs to apply a more holistic project strategy in order to make a sustainable impact on the workforce of persons with disabilities.

Black Industrialist project

Background and purpose

Since 1994, the South African Government has prioritised financial and non-financial support for the business sector through various policy instruments and implementation frameworks. This signals government's commitment to inclusive economic transformation and development.

In 2015, South Africa launched the Black Industrialist Policy, in line with National Development Plan (NDP) to accelerate transformation in the manufacturing sector and drive economic growth and development. The government has formulated policies and incentive schemes to revitalise and grow South Africa's manufacturing sector (DTI, 2018).

Between 2016 and 2021, some R32 billion has been invested through funding initiatives within the DTIC in nearly 800 black industrialist businesses. This funding has supported the creation of new and dynamic enterprises in a number of critical value chains across all nine provinces, crowding in additional investment from the private sector as well as creating and saving nearly 120 000 jobs (DTIC, 2021).

However, in South Africa, the overall contribution of the manufacturing sector to economic growth and employment continues to weaken (Williams, Cunningham & De Beer, 2014; Bhorat & Rooney, 2017). In view of this broader context, the purpose of this research was to:

"To support structural transformation in the manufacturing, engineering and related services sector by understanding the skills development needs of Black industrialists such that Black industrialists become globally competitive in the context of the 4th industrial revolution".

To achieve this, the research had to generate evidence with respect to the skills challenges of Black Industrialists within the merSETA sub-sectors (chambers): metal, automotive manufacturing, motor retail, automotive component manufacturing, tyre manufacturing and plastics. This would be done through the realisation of the following three objectives:

- To understand the skills related challenges faced by Black Industrialists and their impact in competing in the local and global manufacturing sector.
- Influence skills development and industrial/economic policy through credible research informed by a multi-stakeholder consultative process.
- Inform the development of relevant training interventions for supporting the development of locally responsive and globally competitive Black industrialists.

Research methods

The report contains the findings of the three primary data collection interventions in the form of a survey, interviews and focus groups. The findings were analysed and interpreted, and further triangulation of the findings with literature and policy reviews was conducted.

Summary of findings

Skills related challenges faced by Black Industrialists

- Shifts in modes of training from current to expected modes over the next 5 years indicate that Black Industrialists will increasingly prefer more blended forms of training. Therefore, a need to ensure that both the infrastructure and training content is ready to meet this need.
- There is a need for improved data on informal businesses in the mer sector. SETA data only really accommodates the formal sector, further creative data collection could be done to improve the data collected on the informal sector.
- The merSETA should priorities discretionary grant funding for those that submit WSPs and

find ways of assisting those that currently fall outside the reach of the mechanisms at the disposal of the SETA for funding support.

Influence skills development and industrial/ economic
- The merSETA needs to offer more support to the automotive aftermarket sector: The merSETA and other bodies need to find mechanisms to support black businesses get access to government businesses such as servicing vehicles of government departments.
- The merSETA to do more road shows that are informative about concerns BIs might have such expanding their local clientele, accessing advanced technology, and ensuring that their staff is certified. Thus would ensure sustained and effective transformation.

Development of relevant training
- Fast track artisanship by introducing and accelerating Recognition of Prior Learning (RPL).
- Support the concept of the workshop in a box. Black Industrialists can benefit from new and updated support such as machinery and related skills to support their capacity to absorb and apply aspects of the new knowledge and innovation available but also navigate the uncertainties of COVID-19 and 4IR.

Recommendations
Key policy issues and recommendations to the broader skills ecosystem

Firstly, due to the increased need for skilled workers in the sector, there is a perceived need to **revitalise the tool making industry**. Due to the niche nature of the metals and engineering field sector, developing key policy to revitalise training, skilling and certification in the sector is critical.

Secondly, is the need for **alignment between SETA skills training policy and BEE related policies.** Respondents expressed concern of the limited synergies between what SETA's requirements are and what BEE policies are in relation to training.

A possible third policy recommendation from the automotive industry relates to the **need for more accreditation and training centres and technical schools** around the country.

Possible future programmes and projects (medium to long term)
- Programme for training technical specialised skills
- Programme relating to gender within the sector, to increase the participation of female Black Industrialists

Quick wins of initiatives the merSETA can implement in the short term
From the analysis of the findings, respondent indicated a number of potential quick wins the merSETA can implement in the short term to enhance firm's productivity, efficiency and sustainability. The most significant quick wins identified include:
- Flexible funding skills training application and approval process
- The need for more non-accredited courses for specialized skills training
- Create more training and testing centres especially in rural or township areas

Better liaison between the merSETA and businesses was also identified as one potential area which could enhance the skills development efforts within the sector.

Future Focus

Understanding green skills within the mer sector

Introduction

This summary intends to provide an overview of a research project entitled "Understanding green skills within the mer sector". This research project was designed to foster merSETA's understanding of its sub-sectors regarding the green economy and its related skills progress and requirements.

The merSETA Sector Skills Plan (SSP) highlights the 'circular economy' and the 'green economy' as key factors impacting future skills requirements, which led to the inception of this project in partnership with Stellenbosch University.

The project follows on the "Baseline survey of sustainable green-related activities, trends and innovations in the merSETA levy-paying companies" report, which was concluded in 2013; providing a baseline for understanding green skills.

Further, there has been an exponential growth and innovations in the field of green economy and sustainability. The following three research objectives were envisioned:

i. Better understand how merSETA stakeholders interpret concepts related to the green economy and how this has changed since 2013.
ii. Establish a baseline of the skills requirements needed by stakeholders currently and in the near future.
iii. Explore mechanisms through which merSETA can better monitor the demands of the green economy to be more responsive to the needs of its stakeholders.

Research methodology

The project employed a mixed methodology that combined qualitative and quantitative methods including stakeholder engagement workshops, online surveys, systematic literature review and document analysis. Furthermore, the literature search strategy involved a systematic literature review, to ascertain current green economy definitions, skills, initiatives, and activities relevant to the mer sector.

Further to this, the stakeholder engagement workshops developed a shared understanding of the concepts of green economy, green economy activities, and green economy skills.

Two facilitated workshops were conducted (Johannesburg and in Cape Town), comprising of 37 and 17 participants, respectively

Findings

The overall key findings from this research, shifts from a narrow to a more-broad understanding of the green economy, green economy skills and green economy training.

With regard to green skills stakeholders indicated a series of skills requirements were needed to transition into a green economy:

• Awareness raising to understand what the green economy is and what drives it.
• New technical skills for instance, green engineers, renewable energy and carbon management. Green education is not clearly incorporated in Engineering or Management fields.
• The need for knowledge around new green technologies; the development of relational skills; green legislation and compliance requirements; as well as best practices and the improvement of soft skills and communication both within and between the mer sector organisations and their various stakeholders.

In terms of green skills education and training in the manufacturing industry not all green activities are matched with skills requirements over the same timeframe. This stems from the need for various

phases or levels of skills training to progress over time as well as from the ability to implement some basic green activities in the shorter term. In the long-term more sophisticated forms of green activities may need to be developed.

Green skills education and training extends beyond just engineering students and plant operators to include wider audiences, such as top and mid-level managers across organisational departments, in order to foster a culture of sustainability. Furthermore, there is a need for developing new and/or expanding on current training offerings to be greener.

In terms of the resource requirements to develop new green skills training offerings for the mer sector, it was indicated that the merSETA could assist in the development of new green skills training through course development, improving engagement and accreditation, actively building networks and in creating and managing demand for green skills.

Recommendations
Skills development
There is a recognised need for integrating a variety of skills categories and competencies in order to develop a culture of sustainability. Developing a mind-set focused on the inclusion of sustainable practices at all levels within an organisation.

This can be achieved through promoting the development of new technical competencies, processes, and products that are more aligned with the green or circular economy; leading to new green thinking, collaboration and performance.

Capacity building and development
Capacity building refers to the development of new competencies and therefore precedes capacity development, which is the process of building on existing skills and knowledge.

This distinction recognises that merSETA stakeholders require a differentiated approach in terms of green skills development. Fundamentally,

it would also require more direct interaction between merSETA, employer organisations and industry partners to develop company specific responsiveness.

Topic development
Topic development may be informed by the progression of green activities overtime. A recommended approach would be to start with the topics of waste management, including recycling and upcycling, carbon management and energy efficiency, as these topics are already well defined within the Waste and Energy SETA, as well as at private training institutions.

This would allow merSETA to link in with existing training offerings, thereby saving both time and course development costs.

Sector development
It is recommended that merSETA develop a Green Skills unit internally in order to focus on the development of green skills and other related initiatives, for example as related to capacitating women and youth. Having such a dedicated unit would assist in
I.   Instilling the ideals for a green economy throughout the merSETA
II. Streamlining activities and projects
III. Avoiding duplication of efforts and fragmented approaches

Industry development
In terms of industry development, there is need for a more differentiated approach; one that recognises the uniqueness of each chamber as well as the context of each geographical region.

In essence, there is need for more in-depth research to understand how the mer sector and industry partners may transition to a green economy.

Monitoring and evaluation
It was recommended that merSETA develop and track a set of indicators to monitor the success and efficacy of its efforts to transition the sector to a green economy.

Skilled artisans for a global competitive metal industry in South Africa

Background and Purpose

The merSETA commissioned Steel and Engineering Industries Federation of South Africa (SEIFSA) to conduct research into the state of training in the metal industry over a three-year period (2014, 2015 & 2016) horizon. The purpose of this study was to conduct a needs analysis of artisanal trades with specific reference to the following occupations:

- Boilermaker
- Welder
- Millwright
- Fitter and Turner
- Toolmaker
- Patternmaker
- Industrial Electrician

The objective of the study was to determine what reforms should be implemented to ensure that these artisans are relevant, productive and contribute significantly to improving the competitiveness of local firms in the metal industry.

Research methodology

Face-to-face interviews and focused group discussions were conducted with company representatives and industry experts at their work sites. The interviews were semi-structured allowing for the researcher and participant/s to delve deeper into issues raised, while identifying key issues and themes. Site visits were also conducted enabling the researchers to view the training areas and meet instructors and learners.

Key Findings

Findings 1: Misdirected policy purpose

The apprenticeship system has been revitalized and this is largely a result of the failure of the learnership scheme to deliver strong technical skills into manufacturing plants. The current apprenticeship system appears to be driven by increasing the quantity of apprentices, which seems to have impacted on their quality. Government's expected roll-out of mega infrastructure projects has also necessitated a sharper focus on apprenticeship training and this has increased several apprentices in the system.

Despite government's good intentions, little attention is paid to continuous training and development of existing artisans (post-artisan) in the system. It is the latter group that is critical to driving productivity, improving efficiencies, cutting waste and ensuring the competitiveness of companies in the metal industry. With technology advancements and process innovations, there is a considerable need for policymakers to focus on the training and re-training of artisans already in the system. The importance of this area for training appears to be under-rated.

Another concerning problem identified, was the very slow turnaround times to register unit standards and qualifications. There is a strong view that bureaucratic inertia together with convoluted and time-consuming processes has effectively hampered the work of key bodies such as the merSETA, National Artisan Moderation Body (NAMB), and Quality Control for Trader and Occupations (QCTO). There is also a view that NAMB and QCTO lack sufficient resources and are poor at communicating effectively to clients.

Findings 2: Career pathways and professionalisation of trades

Career pathways systems enable artisans to move from their points of entry through education and training programmes to occupational advancement. Unlike professions such as engineering, newly qualified artisans do not have structured career pathways for the rest of their career. Artisans usually remain in their employment positions for the reminder of their tenure, if they are promoted,

it tends to be to mainly at the level of first line manager. Formal qualification pathways for artisans to progress up the organisational structure into engineering and management positions are lacking.

Professionalisation of trades involves establishing acceptable qualifications and a regulatory professional (trade) body to oversee the conduct of members of the profession (trade) and allowing for some degree of demarcation of the qualified from unqualified. Professionalising trades also possess power, prestige, higher income, high social status and privileges.

Findings 3: Mathematics, science and language acquisition in schools

The major problem identified by companies and training providers interviewed with apprenticeship and technical skills training is the poor state of schooling in South Africa.

There is a widespread concern over poor numeracy and literacy competencies of prospective apprentices. Additionally, the performance of learners in mathematics and science in South Africa is concerning and the government has not been able to effectively improve the science and mathematics standards in schools.

Findings 4: Career guidance and counselling

There is a lack of career guidance at secondary school level, this often leads to poor career choices by students entering the post-school education and training system. Training providers indicated that applicants to trade courses in many instances are unsuitable, lack any technical knowledge, and often have no idea of the trade they applied to be enrolled in. It appears that career counselling is not formalised or taken seriously in secondary schools. Where schools have guidance counsellors, their knowledge and understanding of the labour market, economy, industries, impacts of technology, and careers in the modern world is lacking.

Finding 5: Length of apprenticeship

The length of time it takes to complete an apprenticeship in South Africa has been reduced to 2 years or less. Previously apprenticeships took between 3 to 4 years for completion. Currently, there is an effective reduction of training time by between 2 to 2.5 years. This shortening of apprenticeships was given impetus by the merSETA's Accelerated Artisan Training Programme and was supported by the government to boost artisan numbers in the labour market. But this has come with some consequences.

It was established in the research that shortening of apprenticeships effectively means that the quality of the newly qualified artisan is often compromised. They have not been subjected to a sufficient amount of experiential learning and practical application of a variety of tasks.

Other problems indicated was that journeymen are not keen to coach and mentor new artisans as they tend to see this a potential threat to their job, resulting in a fear of being replaced.

Finding 6: TVET college delivery

There is a myriad of problems highlighted by interviewees in the metal industry with respect to public TVET Colleges. Some of the problems have emerged in the study include poor infrastructure in TVET colleges, lack of well-qualified and experienced instructors at colleges, lack of articulation between TVET and higher education.

There is no performance management system at colleges, most programmes lack a work-based training component, training in the trades is institutionally driven rather than industry-driven. It was also highlighted that there seemed to be a leadership deficiency within the college system.

Conclusion and recommendations

Many of the impediments faced by the metal industry fall outside its direct sphere of influence in areas such as: government policy, training standards, administration of the education and training system, implementation failures, performance of public institutions in the education space, and so on. A game changer is needed on the part of government.

These recommendations are wide-ranging and will stretch the resources and capacity of the merSETA. Therefore, a key priority is to assess the extent to which the merSETA will be able to implement the recommendations or align with the relevant authorities to make a positive difference.

Key recommendation drawn from the study

RETHINK POLICY PURPOSE	The purpose of the national skills development policy should fundamentally be to develop high quality, versatile and capable artisans with a craftsmanship mentality, who have mastered their respective knowledge domains and are empowered to function in a modern industrial environment, as opposed to the current policy of "chasing artisan graduate targets".
CREATE CAREER PATHWAYS	There should be a significant effort made by the social partners to create career pathways and "professionalise" the trades. This is to ensure that trades become a first-choice career option for the youth. By "professionalising" the trades, the integrity of artisans will be assured, along with better career prospects. An awareness for youth in secondary schools should be raised especially by merSETA should through its mobile services across the country.
STRENGTHEN STEM IN SCHOOLS	Strengthening Science, Technology, Engineering, and Math (STEM) skills at a school level is the foundation of a world-class artisanal workforce of any nation. It is the basis of enabling an artisan to work proficiently in the workplace. The public schooling system should be one of the priorities in government department and measures should be enacted to improve the performance of educators, department officials and public schools overall. Teacher in-service programme for mathematics and science should carried out in all institutions to ensure effective teaching system.
CAREER GUIDANCE AND COUNSELLING	The entire system of career guidance and counselling in the national education and training system should be "reconditioned" to ensure that it is responsive to the needs of learners at all levels in the system. It should become a mandatory component of the curriculum. The department of Basic Education (DBE) and the Department of Higher Education and Training (DHET) should run a national multi – media campaign, including television, to promote trades and other occupations in high demand. Furthermore, teachers and school managers should undergo training workshops to enhance career guidance and counselling.
APPRENTICESHIP DURATION	The duration of apprenticeship should revert to 3 to 4 years to allow the apprentice to accrue sufficient relevant workplace experience. Passing a trade does not make an individual an artisan.
TVET DELIVERY	Public TVET Colleges are the backbone of the post-school system and the engine to drive the manufacturing industry. The highest priority is to strengthen TVET Colleges in this country and turn them into credible institutions of first choice.

Readiness of the local metal industry for Industry 4.0 (4IR)

Background and purpose

The purpose of this study is to assess whether the domestic metal industry firms and workers are prepared for the technological disruption that defines Industry 4.0.

Concerns revolve around legacy machinery and equipment; understanding how to exploit production data; absence of a national industry strategy; high energy costs and unreliable electricity supply; skills shortages and the parlous financial situation of some steel producers and metal firms.

Methodology

The 4th industrial revolution (4IR or Industry 4.0) is a complex topic and is in an exploratory stage. To investigate the topic and its implementation in the local metal industry, a mixed methods research approach was chosen, combining both quantitative and qualitive methods.

Summary of findings

Respondents were asked to state whether their firms were applying the following 4.0 technologies:

The finding from a survey of 25 experts in the metal industry revealed the following:

- All 25 of the participants indicated that their firms are currently using cyber security, the internet of things and system integration, albeit in varying degrees.
- Six experts indicated that firms were using additive manufacturing (3D Printing), while 13 experts indicated their company was using predictive maintenance and only 6 experts indicated their company was using simulations. Globally these trends are growing in popularity due to increase in available software and decline in the cost of these technologies as they become more popular.
- Two experts indicated that their firms were using autonomous robots. However, the investment in this application differs in terms of the sophistication of the manufacturing operations.
- None of the applicants mentioned whether augmented reality applications were being used.

These findings indicate that some applications are currently used in the metal industry, such as the internet

System integration	Cybersecurity	Predictive maintenance	Autonomous robots
The process of linking together various IT systems, services or software to enable all of them to work functionally together. Cybersecurity	The practice of protecting systems, networks, and programs from digital attacks.	A technique that uses condition monitoring tools to track the performance of equipment to detect defects and fix them before the result in failure.	Like humans, they have the ability to make their own decisions and then perform an action accordingly.
Additive Manufacturing	Augmented Reality	Simulation Also called Virtual Reality (VR).	Internet of things
3D printing as it is known, builds up components from scratch, using only the material needed and minimising waste.	A technology that superimposes a computer-generated image on a user's view of the real world.	The use of computer technology to create a simulated environment.	A network of machines and devices that have built-in connectivity, electronics, software or sensors that allow them to share data and improve efficiency.

of things, system integration and cyber security, are being used. These already used technologies can be considered as low-hanging fruits and considered necessary in any type or size of business. However, the industry has yet to make investments in the more complex technologies and applications.

Based on the limited findings of this research, the readiness of companies in the metal industry for Industry 4.0 is questionable, as there are some signs of the adoption of necessary technology, but this is quite limited. Some of the reasons for the lack of adoption of Industry 4.0 technologies that were identified in this research include, but are not limited to, poor economy (limited growth), lack of capital, labour disputes, unreliable and costly electricity supply, lack of business confidence and policy uncertainty in the local economy, as well as more business-friendly countries that are attracting greater investments.

Conclusion and recommendations

Based on the findings of this research, the metal industry shows adoption of some of the technologies needed to drive Industry 4.0. This, however, does not come without a number of limitations experienced by companies in the metal industry, as expressed by the experts interviewed.

In an attempt to address these limitations, the following recommendations should be considered:

- *Develop a national metal industry strategy to drive Industry 4.0*
  - Develop a national metal industry strategy to drive Industry 4.0 implementation, increase the adoption of new technologies, develop human capital, incentivise plant upgrades and improve the competitiveness of companies active in the metal industry.
  - Formulate a digital roadmap and a strategic vision for a fully integrated multi-stakeholder policy.
  - Increase state investment in research, innovation and development in advanced manufacturing technologies.

- *Apply Industry 4.0 technologies in firms*
  - Empower firms with the tools to assess their current digital maturity, determine what should be done, and devise a plan to get there.
  - Assist firms to apply Industry 4.0 technologies gradually and adopt solutions that are not necessarily expensive.
  - Establish dialogue platforms, knowledge and experience sharing to help firms, especially SMMEs, move into the digital economy.

- *Devise and implement a metal industry-led skills development plan*
  - A skills development plan should be developed by the industry for the industry.
  - The industry should negotiate with the merSETA to ensure training and funding allocations for industry are demand led.
  - The industry skills development plan should emphasise the changing nature of jobs, continuous learning, technical competencies, digital literacy, interpersonal skills and multiskilling.
  - Programmes should be offered for human-machine interaction. Workers should be empowered to work with intuitive interfaces and supported by innovative assistance systems.
  - Tools such as blended learning, mobile learning, micro-learning and learning-on-demand should be developed.

- *State incentives for plant upgrades and digitalisation*
  - The state should develop a comprehensive incentivise programme to encourage plant upgrades and digitalisation through subsidies, tax write-offs, tax holidays, tax exemptions, tax reductions, accelerated depreciation, investment allowances, low-interest loans, land and infrastructure incentives and regulatory relaxation.
  - The amount of support provided should be based on the size of the firm, with SMMEs qualifying for more generous incentives.
  - Incentives should be offered to generate positive externalities by bringing new technology to the industry.
  - Other incentives include classes and training, development centres, small business incubators, centres of excellence, research oriented industrial parks, applied research grants, technology transfer program

Motor industry skills of the future: relevance of occupations and skills for the South African motor industry

Introduction and objectives

This research focused on two units of the South African value chain; first, Tier 1 automotive component manufacturers which include automotive electronics; foundry/forge; glass; harnesses; heat transfer; JIT assembly; metal fabrication; metal form/press; plastic moulding; precision machining and trim. The second units is Automotive aftermarket service and support (AAS&S) sectors which include Dealer networks (retail, maintenance and repairs); Service provider networks; and Support providers (the importing of vehicles, branding and marketing; driver assistance programmes, etc).

The research sought to understand the reorganization changes at workplaces and to determine what skills development is available and required by people in order to adapt and remain relevant to the changes within the Motor Industry.

The primary research question is supported by several secondary research questions:

- How will South Africa respond to the challenges presented by disruptive technological changes in global automotive value chains?
- What future skills development will be needed and available for people to adapt and remain relevant to these changes?
- What skills are required to achieve the vision of SA's automotive manufacturing policy framework, the South African Automotive Master Plan (SAAM)?

The objective of report is to understand what impact the motor industry megatrends will have on skills and occupations in the workplace. In so doing, the report seeks to determine:

- How the market and consumer trends have changed motor vehicles
- How changes in vehicle specifications have affected the maintenance and repair of vehicles
- How the changes in vehicle specifications have affected the manufacturing components for vehicles
- How operational changes in the manufacturing, maintenance and repair of motor vehicles have affected occupations
- What skills and competencies are required to fulfil occupational roles
- What can be done to develop, reskill and upskill people to become relevant
- What can be done to develop the skills that do not exist
- What implications workplace reorganisation and skills reform will have on skills and labour authorities

Research methodology

The research methodology approach combined desktop research, qualitative primary research and quantitative primary research. The desktop research was drawn from various resources, including firm-level data from MB Analysts benchmarking databases, insights from the South African Automotive Master Plan project, a policy framework which combines consultative views of the industry, labour and government stakeholders.

Past research relating to automotive sector and associated skills development needs of the industry were also consulted. The findings from desktop research were supplemented by qualitative consultative processes through workshops and

interviews in Johannesburg, Pretoria, Port Elizabeth and Durban. The quantitative primary research process included the preparation of electronic questionnaires, which were guided by desktop research and focus group output. Three versions of the questionnaire were developed to be target Tier 1 automotive manufacturers and Aftermarket Services and Support.

Key Finding and Recommendations

Research findings reveal that significant investments in skills development will be needed across various job categories, particularly in the areas of new materials design, electronics and mechatronics (to respond to the rapidly emerging trend of EEVs and light-weighting).

Process technology will be deeply affected by the rise of machine learning and artificial intelligence, and the trend towards automation is likely to accelerate. Given SA producers' reliance on a large, low-skilled workforce comprised primarily of production workers / operators, this job category will become increasingly vulnerable to disruption, and even displacement.

South Africa's already low contribution in terms of production volumes, value addition, and levels of domestic content in locally assembled vehicles is clearly a vulnerability; particularly as value addition becomes progressively concentrated in the hands of the international OEMs and the related automotive branding, sales, and aftermarket service providers.

The stringent nature of modern regulatory requirements will have a significant effect on automotive production in South Africa. Regulators in developed markets, and by extension, OEMs, are likely to continue pushing ever more onerous compliance obligations onto global suppliers, and SA's skills training programmes should seek to align local producers with these requirements.

Similarly, the growing demand for high-level ICT and quantitative reasoning skills will require local skills authorities to invest in relevant training programmes to fill the skills gaps that are currently evident in this area. On the policy level, the MerSETA should consider ways of coordinating its various initiatives between the Automotive Industry Chambers (i.e. the Automotive Chamber, Motor Chamber and New Tyre Chamber). In conjunction, the Department of Labour and other relevant labour authorities will also need to consider ways of regulating the automotive industry in a more harmonised fashion.

It is evident that skills must be used as a component of job grading, but the accountability; complexity and description of work as well as the administrative processes must also be considered. Moreover, skills authorities should find ways of keeping skills development initiatives relevant to new technological trends, while ensuring that these initiatives align South African producers and automotive services providers with international standards.

As highlighted throughout the report, skills and labour authorities will need to collaborate and conduct regular research into the dynamic skills requirements of the automotive industry to understand how skills and occupations are changing, and to respond accordingly.

Conclusion

Research findings reveal that significant investments in skills development will be needed across various job categories, particularly in the areas of new materials design, electronics and mechatronics (to respond to the rapidly emerging trend of EEVs and light-weighting). Process technology will be deeply affected by the rise of machine learning and artificial intelligence, and the trend towards automation is likely to accelerate.

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Potential employment implications of the Fourth Industrial Revolution

Background

It is important to understand the potential risks associated with automation in the South African manufacturing context. From a South African policy standpoint, the manufacturing sector is seen as an engine of growth and source of accelerated employment creation.

However, this sector has undergone premature deindustrialisation – evident in declining manufacturing employment shares – since the 1980s (Bhorat, Lilenstein, Oosthhuizen & Thornton, 2020).

While the impacts of automation are felt across the entire labour market, they are particularly acute in the manufacturing sector. Workers involved in routine tasks are most vulnerable to being displaced by technology (World Bank, 2019).

This is evident from the statistics that show approximately two in every three robots are employed in the automotive, electronics, metal and machinery industries (World Bank, 2019).

This is certainly worth noting given that these industries strongly overlap with those in the manufacturing, engineering and related services (mer) sector.

In context of these developments and changes in manufacturing, the merSETA commissioned this research under the guidance of the Development Policy Research Unit (UCT), with the intention of examining the potential risk of automation – driven by the advance of 4IR technologies.

This research focused on determining the potential impact of automation on labour market outcomes in the mer sector at the occupational level.

Methodology

This research objective was achieved using three methods. Firstly, to determine the concept of occupational relatedness based on occupations' task content. Second, additional measures of task content were used to identify which mer sector occupations are at high risk of automation.

Third, labour market survey data was used to analyse the characteristics of mer sector workers who are employed in these high risk of automation occupations. In order to complete this two datasets were used for analysis: firstly, the Occupational Information Network (O*NET) database, and secondly, the Post-Apartheid Labour Market Series (PALMS) database.

Findings

Based on the findings it is clear that the sustained decline in the price of computer capital in recent decades is driving a new wave of automation. Specifically in the manufacturing sector, the impact of automation is evident in employment and wage polarisation with the 'hollowing out of the middle', which is characterised by a predominance of manufacturing sector occupations.

Empirical literature points to both declining employment shares and stagnant wage growth in the middle of the skill distribution, where many routine task intensive manufacturing occupations reside.

Specifically in the mer sector, the largest absolute decline in employment occurred in the Metal chamber, which accounted for approximately half of all jobs lost. Relatively speaking (in percentage terms), the Auto components chamber has

experienced the greatest loss of employment between 2010 and 2018, with job losses of approximately 33.82% – 2.3 times higher than the Plastics chamber with the second highest relative job loss.

Coupled with the decreasing level of overall employment in the mer sector, the absolute number of employees at risk of automation decreased between 2010 and 2018. Although there is a general trend of at-risk employment decreasing for the mer sector, this is not the case for the Metal chamber, where levels of at-risk employment increased by approximately 3 300 employees (or 2.17% of 2010 employment levels).

The New Tyre and Plastics chambers show disproportionately more risk of automation than other chambers when considering the top 10 at-risk occupations. Interestingly, although the Metals chamber employs workers in the highest absolute number of top 10 at-risk occupations, it seems to be disproportionately less at risk of automation, accounting for only 20.72% of total at-risk employment amongst the top 10 occupations compared to an approximate 66% share of total mer sector manufacturing employment.

Based on the data collected it is not immediately clear what the impact of automation on employment in the mer sector is likely to be. The top 10 most at-risk occupations make up less than their proportional share of total mer sector employment, meaning that the employment displacement effects of automation may be more modest than expected.

Regarding the racial make-up of the mer sector workforce, a number of patterns emerge. First, the average proportion of African individuals employed in mer sector occupations, particularly in non-routine and intermediate occupations, has increased.

Given the negative correlation between increased risk of automation and increased skill level, as described above, this result may suggest an up-skilling of African workers in the mer sector. However amongst non-routine occupations, there is

still a relative overemployment of White individuals. The share of African workers in routine tasks is consistently and significantly higher than the share employed in non-routine tasks, while the opposite is true for White workers.

This speaks to African individuals facing a significantly greater risk of automation compared to White individuals, who are relatively sheltered from automation.

The statistical evidence suggests there is no particular correlation between average age of employees in a given occupation and risk of automation.

There is some evidence that occupations that are more female-dominated than the average occupation in the mer sector are in general less likely to be at risk of automation than occupations that are more male-dominated.

Occupations characterised by workers with lower levels of education are more at risk of automation than occupations characterised by workers with higher levels of education.

This result is consistent with the findings above which indicated that the average level of education amongst those employed in routine occupations was significantly lower than among those employed in non-routine occupations.

Evidence collected suggests that policy aiming to protect employees from automation may only have to ensure that workers have a completed secondary education rather than a tertiary education.

Given South Africa's relatively fragile schooling system, and low levels of educational attainment, this provides hope that the mer sector may be able to continue providing employment opportunities to less-educated workers in the future.

Simply by completing a secondary education, an individual is immediately more aligned with the tasks and requirements for a non-routine occupation than

a routine one and less likely to be in an occupation at risk of automation.

Union membership, on the other hand seems to increase the likelihood that an individual will be employed in an at-risk occupation: specifically, employees who belong to a trade union are approximately 5.4% points more likely to be employed in an occupation at risk of automation than their non-unionised counterparts.

Furthermore, risk of automation increases as firm size increases. As employees find themselves employed in larger firms, their likelihood of finding themselves employed in an occupation at risk of automation increases.

Conclusion

Employment in the manufacturing mer sector has shrunk by approximately 1.5% per annum, leading to a total decline in employment of approximately 80 500 individuals. As a result, the relatively constant share of high-risk employees translates to a shrinking absolute number of employees at high risk of automation over the past decade. Indeed, over the period 2010 to 2018, the absolute number of high-risk employees has shrunk by approximately 24 000 employees.

Simultaneously, the number of employees employed in non-routine occupations has grown by approximately 10 700 over the period. Occupations at high risk of automation are not randomly distributed across the mer sector occupational space. A clear dichotomy is evident, with occupations located in the production orientated cluster being decidedly more at risk to automation than occupations in the non-production orientated cluster.

Further, a number of high risk occupations falling within the production orientated cluster represent substantial shares of the mer sector labour force – for example, machine tool operators, welders and flamecutters, and hand packers, and other manufacturing labourers, together, account for approximately 29.5% of total mer sector employment.

Three implications emerge:

Firstly, automation is likely to jeopardise low- to medium-skill employment in the production cluster occupations, and correspondingly result in an increase in relative demand for semi- and high-skilled non-production cluster occupations.

Second, the non-random distribution of high risk occupations across the two clusters of the occupation space, suggest that the skill transition to shift workers from high to low risk occupations is long. Third, the relatively high employment share associated with high risk occupations in the production cluster, indicates that the displacement effects resulting in technological unemployment are likely to be substantial.

It is worth noting that while 4IR technologies may driving automation, they also have the potential to create new job opportunities, new tasks and thus new occupations. This is evident in the mer sector.

Evaluations

merSETA WBL tracer study integrated report

Background

Urban-Econ was commissioned by the merSETA to conduct empirical research into the impact of merSETA and sector-funded workplace-based learning (WBL) programmes.

Work-Based Learning (WBL) connects learners directly to the world of work, increases their job prospects through exposure to relevant work skills, while cultivating social inclusion among people who generally have limited access to the labour market. Some of the factors that disconnect learners from the world of work include poor education and training, lack of career guidance and lack of knowledge and information on how to enter the labour market. When implemented correctly, WBL has a number of beneficial outcomes.

The overall purpose of this study was to understand the outcomes of WBL programmes through the tracking and tracing former beneficiaries (participants) who took part in the merSETA-funded WBL programmes, consisting of the internship, apprenticeship and learnership for the 2017/2018 calendar year. The key objectives of this study were to:

- Determine the destinations of participants who have successfully completed learnership, apprenticeship and internship programmes
- Understand the factors associated with employment and unemployment
- Understand the intricacies of the articulation of qualifications in occupations
- Determine the nature of employment of participants who received employment
- Assess whether participants embark on further studies after the initial intervention

Research methods

A mixed method approach was adopted and questionnaires were administered through Survey Monkey via a call-centre on Urban-Econ's premises. All four categories of informants (learnership, apprenticeship and internship beneficiaries and employers) were contacted and their responses were recorded and interpreted. Employers to be interviewed were also discussed, in accordance with the DHET requirements, a total of 20 employers were targeted for telephonic interviews.

In this regard, purposeful sampling was undertaken to ensure representability of employers in terms of size, programmes hosted, number of beneficiaries hosted and chamber.

Sampling of the respondents was done as prescribed in the sampling protocol for the centralised SETA WBL study by DHET. Accordingly, a sample size of approximately 773 participants across all three learning programmes was drawn from the population, using a 95% confidence interval with a 5% margin of error. The probability sampling method was followed, allowing for some degree of confidence to make inferences about the larger population.

Findings

The WBL programmes provide increased chances of accessing employment and career advancement opportunities. According to the findings there was a 36% increase in employment for beneficiaries post intervention from both learnersihps and apprenticeships, while the biggest increase in employment came from internships with a 54% increase.

Overall the learnerships, apprenticeships and internships programmes had a positive impact on the skills development of beneficiaries–the majority of those who found employment post-WBL programme were within a short space of time after the programme ended (76% of those in apprenticeships were employed immediately).

Subjectively, some respondents were less positive about the impact the programme had on their skills development in securing employment and realising their career expectations.

Overall, the programme appears to have improved the skills and knowledge of beneficiaries in the sector, with 87% of the respondents indicating that they learned more about the industry through their programme. Most respondents stated that they also found personal value and development through the programme.

WBL programmes seem to have a positive impact on the organisations through the beneficiaries as host employers as 44% of the beneficiaries felt they brought new knowledge and innovation to the company. Challenges experienced by the hosts included additional strain on budgets, time constraint in mentoring and grooming as well as few mentors to oversee beneficiaries. Mentorship and guidance are key aspects of WBL programmes and crucial for its success. Respondents who did have mentors indicated that the mentors were adequately available during WBL programmes for support, guidance and leadership purposes.

Recommendations

On-going monitoring and evaluations:
- The merSETA needs to constantly follow-up with beneficiaries throughout the programme and allow them an outlet through which they can raise concerns.
- The merSETA should conduct regular monitoring to ensure that employers are able to maintain records and reports on beneficiaries' performance and workplace experience throughout the duration of the programmes.

Programme impact:
- Further research should be undertaken to identify the root causes of poor employment outcomes in the industry for WBL programmes. Specific focus areas should be on existing and anticipated labour constraints, the industry and economic status and future outlook, as well as improvements into the programme and other

strategies.
- To end the decrease in the intake of beneficiaries for WBL programmes, the merSETA should review the possibility of introducing incentives for employers to ensure that beneficiary uptake is maintained and/or increased.
- More needs to be done to ensure that the workplace readiness assessment guarantees that women are accommodated and treated equally at the host organisations.
- The verification of training providers prior to the start of each programme is vital to ensure that the training providers are up to standard. There is a need to ensure that strict quality assurances for programmes provided to beneficiaries are applied.
- The merSETA should continuously review the curriculum, ensuring that learning programmes have evolved to include soft/transversal skills development as a fundamental component of the training provided. The National Occupational Curriculum Content (NOCC) approach can guide SETAs on how to integrate technical training and soft skills development as well as integrated workplace exposure into a packaged unit for the complete benefit of both the individual and the mer sector.

Programme administration:
- The merSETA should review its administration processes and improve where found lacking. This should be done in an effort to combat delays in payments, delays in providing guidance, support and feedback (to both beneficiaries and host employers).
- The merSETA should investigate and adopt a more integrated communication and coordination approach of programme efforts between the training provider, the host employer and the merSETA to ensure consistency in programme conduct.
- The findings revealed that only 55% of the host employers indicated that they were satisfied with their interaction with the merSETA regarding WBL programmes, this implies the need for merSETA to improve their interaction with the host employers to increase satisfaction.

Evaluation of the merSETA Retrenchment Assistance Programme (RAP)

Background and Objective

The South African economy is under immense strain in the wake of misappropriation of state funds and the COVID-19 pandemic, resulting in many companies, especially in the manufacturing sector facing threat of closure or downsizing.

As a result many workers face the threat of losing their jobs with little hope of finding formal employment once they are retrenched. This is intensified by the impact of the new technological era imposed by the Fourth Industrial Revolution (4IR), impacting on the labour force, which requires them to upskill and reskill to ensure competency.

At its inception in 2009, Retrenchment Assistance Programme's (RAP) main objective was to retain workers who have been, or are in the process of being retrenched as a result of the downturn of the industry or workplace closure, due to the global financial crisis.

Currently in 2020/21 South Africa is in a similar economic position, impacted by COVID-19 and national efforts to curb the spread of the virus. Training offered by the RAP was intended to help retrenched workers improve their skills or develop new skills so that they could re-enter the labour market as soon as possible or start their own small businesses.

The merSETA appointed Redflank to conduct an evaluation of the RAP since inception in 2009. A review of this programme was well timed, with a number of retrenchments on the rise in South Africa as a result of the COVID-19 pandemic. Possible future interventions could benefit from the findings of this research.

Methodology

This approach comprised of desk-based research and field research, covering both quantitative and qualitative methodologies (mixed methods). The desk-based research involved the collation and review of relevant documentation as well as inclusion of publicly available data sources for additional information.

Field research included distributing electronic surveys, and conducting interviews. Stakeholders consulted included co-operatives, the merSETA staff, trade unions, training providers, RAP companies and beneficiaries.

A combination of random and purposive sampling was used which resulted in 216 electronic survey responses and 43 interviews, totalling 259 consultations out of the 180 planned consultations.

Key Findings

Overall the programme was not adequately able to positively contribute to reduced unemployment amongst RAP beneficiaries, with only 21% of interviewed persons attesting to the Programme's positive impact in reducing unemployment in the broader society.

However, the merSETA has been commended by companies participating in RAP for having no problems and being a really well thought out intervention.

Some of the notable strengths of the RAP included:
- **Identifying candidates:** candidates were easily identified and registered, the number of people participating in the project was highlighted a strength.

- **Arranging training of beneficiaries:** from the feedback 94% of surveyed beneficiaries indicated that the merSETA had arranged training for them. However, beneficiaries indicated that they did not receive their certificates from training providers after completion of their training.

- **Registration of RAP beneficiaries on the merSETA system:** all the surveyed beneficiaries indicated that they were registered as "learners" on the merSETA's system.

- **Allocation of funding to RAP beneficiaries for training:** the majority of the surveyed beneficiaries (87%) confirmed they had been allocated and provided funding to complete their training programme.

- **Creation of self-employment in the informal sector:** 29% of surveyed beneficiaries indicated that they are currently self-employed in an informal business as a result of the training.

Some of the areas of the RAP that were less effective and considered as weaknesses to the programme included:

- **Inability to create co-operatives:** 2% of surveyed beneficiaries indicated that they formed a co-operative as a result of the programme. All of the interviewed beneficiaries which formed co-operatives indicated that these co-operatives were not sustained, due to a lack of necessary funding.

- **Inability to reduce unemployment amongst beneficiaries:** 48% of the interviewed programme beneficiaries struggled to secure employment after receiving training, only 15% of them secured employment as a result of their training from the programme.

- **Inability to reduce unemployment amongst the general population:** The dominating perception amongst stakeholders was that the programme contributed minimally to the reduction of unemployment amongst the general public.

Recommendations and lessons learnt

Based on the successes and short-comings of RAP, a number of recommendations and lessons learnt can be interpreted. Any future programmes that attempt to reskill and upskill retrenched workers should consider these, prior to their design and commencement:

- **Little awareness of the programme and its benefits amongst employers and employees:** greater emphasis should be placed on the marketing and communication of such programmes. Improved communication on the program regarding the intended outcomes, timelines and potential benefits is essential.

- **Involvement of other key stakeholders:** a number of important stakeholders were not formally involved in RAP, creating some inefficiencies. Important stakeholders such as the Commission for Conciliation Mediation and Arbitration (CCMA) and the Department of Labour should have been closely involved in the programme.

- **Receipt of training certificates:** better monitoring of programme milestones is required to ensure that at each stage, all deliverables are fulfilled. This is particularly important for the provision of certificates to beneficiaries.

- **The co-operatives that were established were not sustainable:** the programme was limited within its ability to provide certain business funding to co-operatives, future interventions should aim to assist co-operatives with funding applications and securing of other sources of funding.

- **Many beneficiaries believed that the training did not provide useful skills for future employment:** a skills development needs analysis should be conducted by the service provider as part of the pre-training assessment for beneficiaries.

Programme desirability, impact or relevance: mechanical engineering, civil engineering & electrical engineering

Purpose

The aim of this study was to gather the views of civil, electrical and mechanical engineering employer representatives as to: the extent to which their organisation need graduates with the HEQSF-aligned engineering qualifications that are on offer; whether there are any other engineering qualification(s) which Walter Sisulu University (WSU) should consider offering; how industry rates the competency of graduates from WSU; what are the five most important criteria for the recruitment of newly qualified engineering graduates; whether there are competency areas (needed in employment) that should be expanded on, or more comprehensively covered in the curriculum. In addition, the study also aimed to gather the views from prospective civil, electrical and mechanical engineering students as to: whether they are interested in enrolling for the new HEQSF-aligned qualifications that WSU plans to offer; when they are likely to enrol for these qualifications; their preferred mode of study; their preferred campus; whether there are any other engineering qualifications that they would like to see WSU offer.

Research methods

A descriptive and evaluative questionnaire was developed utilising Survey Monkey software as the data collection instrument. The population sample for the employer study was derived through a process of stratified sampling to ensure employer representation from persons with the relevant experience, professional profile and who has, or may in the future interact with civil engineering students and graduates from WSU. The population sample for the student demand study were predominantly drawn from WSU engineering alumni who had graduated with a Diploma or BTech qualification from any of the WSU campuses in the last 6 years (2010 to 2017).

Summary of findings

Employer study

Employers expressed the strongest need for graduates with qualifications at the BEng Tech level. A lower demand value was yielded from the Advanced Diploma even though it is equivalent to the BEng Tech degree, this may have been attributed to employers not being familiar with it. Demand for graduates with post grad qualifications, i.e. with Honours and Masters degrees, was significantly higher among civil engineering employers, in comparison with their counterparts in the electrical and mechanical sectors.

Employer representatives suggested that WSU consider offering the following programmes, in addition to the generic qualifications in the three engineering disciplines

- *At Diploma level-* Mechatronics, Industrial Engineering, Logistics, Electronic Engineering
- *At Post Graduate level-* Project Management, Engineering Management
- *At Degree level-* Urban Engineering

Employers therefore rated the collective competencies of WSU Engineering graduates as being slightly above the scale point of "neither high nor low". The competency for "individual and teamwork ability" had the highest rating for both cohorts while the competency rating for "independent learning ability" also ranked among the top three competencies for both Civil engineering and Electrical & Mechanical engineering cohorts.Employers noted that "engineering-specific/technical skills" and "academic results" are the most important criteria to be used in the recruitment of new graduates. Personal skills and communication skills also ranked high on the list of important employment considerations

The areas to be strengthened in the curriculum for the future qualifications, among others:

- Design aspects- Exposure to design software packages (Civil), better understanding of how to produce engineering drawings (all disciplines)
- Project Management
- Soft skills- time management, critical thinking, self-development skills for all disciplines
- Problem solving ability- Methodology of solving engineering problems (all disciplines)
- Ensuring content of engineering subjects are based on current practice (all disciplines)
- Integrating aspects of global workloads demands - digital analytics, informatics, business analysts etc. (all disciplines)

Student demand study

Interest among prospective students: the demand for programmes at Honours and Masters level can possibly be attributed to many respondents working in the civil engineering consulting sector, a sector that values specialisation, which can often best be obtained through completion of higher-level studies. It also became clear during the survey that prospective students are not familiar with the new type of engineering qualifications, such as the Advanced Diploma that are provided within the HEQSF. The survey reflects that there is an immediate interest to enrol all the engineering qualifications that WSU is considering. The results also show that the interest to enrol for post grad qualifications in engineering is sustained, with prospective students showing strong interest throughout the first five years, up to the year 2022 and beyond. Prospective students, across all engineering disciplines, prefer the Buffalo City campus over the one in Butterworth for furthering their studies. The reasons for this can possibly be attributed to the urban setting at Buffalo City that, as a result of a larger industry presence is home to more prospective students. Prospective engineering students, across all Engineering disciplines, expressed a preference for Part Time (block sessions) as their preferred mode of tuition. The limited interest for full time studies can possibly be attributed to many of the prospective students being in employment, which makes it difficult for them to be absent from the workplace for extended periods.

Recommendations

The suggestions made by students are broadly aligned with the needs expressed by employers, however, there is a need explore and conduct further research within the specific areas on concern that both the employers and students have raised. Most of the additional qualifications/ specialisation stream/short courses, that students have expressed an interest in can be developed as parallel qualifications, or as specialist streams, nested within the generic qualifications that WSU plans to offer in the disciplines of civil, electrical and mechanical engineering.

Conclusion

Seeking the views of employers and graduates, remains an important part of the quality assurance process and is embedded in programme accreditation criteria. Not only does it promote engagement between academic institutions and external stakeholders but it also provides evidence of the efforts made by an institution to actively assess the responsiveness and relevance of its academic programmes. Employer and students demand studies, as contained in this report, contains baseline information that is both useful and informative and serves to improve programme design and delivery.

Civil engineering students	Electrical engineering students	Mechanical engineering students
Degrees in Urban and Structural Engineering	Qualifications in Mechatronics	Qualifications in Mechatronics
Post graduate qualifications in Project Management	Qualifications in Industrial Engineering	Qualifications in Industrial Engineering
Qualifications in Land Surveying	Post graduate qualifications and/or short courses in Project Management	Qualifications in Quality Management
Specialised short courses, e.g. AutoCAD, Project Management	Specialised short courses, e.g. Control Systems	Post graduate qualification in Project Management
		Specialised short courses, e.g. Safety, Project Management, Inventor and CAD

Interest from students for additional engineering qualification(s)

The shortfall or lack of plastics technicians and plastics engineers in South Africa

Purpose

The purpose of the research was to establish the level and impact of shortages of plastics technicians and plastics engineers in South Africa and to establish what can be done to address this problem. The study also focused on the current status of industry and academic collaboration in the plastics sector.

Research Methods

In view of the research topic a mixed methods approach utilising both quantitative and qualitative methods was decided on. The first and second phase of data collection (quantitative analysis) involved the analysis of the merSETA Workplace Skills Plan and Annual Training Report data form the last 5 years (2013 to 2017). Desktop research (qualitative analysis) was also conducted into education and training offerings at NQF levels 6-10 aligned to the plastic sector. The third phase of data collection (qualitative analysis) involved semi-structured (face-to-face) interviews conducted across four categories of respondents.

Summary of Findings

There was a strong contextual finding from the study that the plastics industry in South Africa, in general, is not globally competitive. Factors and circumstances perceived to contribute to this being the case are outlined below:

(Graduate) engineers and technicians in the plastics industry

OVERALL Finding 1: Uptake of graduate engineers and polymer scientists in Industry. Graduate engineers and post-graduate polymer/materials scientists are by-and-large not perceived by industry to be essential for plant function and performance. But there is an appreciation of the analytical capabilities of engineers and an awareness of the engineer technician differentiation with respect to job functions and where they can add value.

OVERALL Finding 2: Areas of knowledge & competence shortcomings of graduates. Apart from sub sector-specific shortcomings with regard to practical knowledge and expertise (on-course practical exposure to current industry machinery), areas of knowledge and skill/competence and attribute shortfall among job entry-level graduate engineers (and polymer scientists) are high level analysis and advanced problem solving; contextual process/project management, and interpersonal and communication skills, which undermine teamwork capability. Interestingly, shortcomings with regard to disciplinary knowledge were not highlighted.

HE-level education and training provision & research support

OVERALL Finding 3: Current scope and relevance of current qualifications. With the exception of Stellenbosch University, undergraduate qualifications/ programmes are limited to a B Eng or BSc Eng degree in chemical engineering as the generic entry level programmes but they do not have any significant level of exposure to plastics materials science and processing. Specialisation in polymers/materials science and materials engineering only happens at post graduate level (studies and research projects). However, a mechanical engineering dimension (conversion process-focus) is not addressed.

OVERALL Finding 4: An 'ideal' plastics industry (conversion) engineering qualification. Industry respondents: A combination of polymer science and mechanical engineering disciplinary knowledge fields together with grounding in conversion sub sector-specific process knowledge.

HE respondents: A qualification comprising a polymer/ materials science–process (chemical) engineering disciplinary blend focused on providing students with a solid grounding in knowledge of 'plastics-specific' science and processing.

OVERALL Finding 5: Funding shortfall as critical cross-cutting theme impacting on education and training provision, uptake and research output. Increasing 'critical' shortfalls in funding for universities in recent years severely inhibit the capacity of academic departments and research institutes to deliver on all aspects of provision.

Such a drying up of funding is widely bemoaned and in particular regard to:

- Bursary funding for both undergraduate and post-graduate students has become increasingly difficult in recent years – that is, not just for covering tuition fees but also living and travel expenses
- Research funding in respect of post-graduate student enrolment and research projects (no institutional funding for research, including staff and equipment) • Funding for internships for graduates
- Industry demand/ support for short course provision has declined dramatically in recent

HE–Industry partnerships and collaboration – shortcomings

OVERALL Finding 6: In general there is a 'disconnect' between industry and HE which results in misunderstanding of their respective offerings and collaborative opportunities. Various strategies and interventions have been tried but they lack sustainability, leaving informal networking as the chief mode of engagement. The lack of collaboration is seen as having a negative impact even though both industry and HE appreciate their mutual interdependencies.

OVERALL Finding 7: A general lack of a trust-based 'working relationship' between industry and HE inhibits the collaborative commercialisation of innovative research. Industry appear, by and large, to be the

Recommendations
Stimulating the uptake of engineers in the plastics industry
OVERALL Recommendation 1: The current low uptake of qualified engineers and technicians could be mitigated through advocacy by industry bodies, with particular reference to advocacy/ awareness-raising:

- In schools concerning career opportunities in the plastics industry and corresponding education and training opportunities at relevant HE institutions.
- In industry about the potential value-add to

company performance by qualified personnel (graduates and post-graduates) in relation to key attributes and competences like principled, disciplinary knowledge, socio-economic understanding of the impact of engineering, high level analytical capability and the capacity for critical and innovative thinking.

Enhancing the scope and relevance of HE provision
OVERALL Recommendation 2: The Plastics Chamber and Plastics SA should assume strong leadership and facilitating roles to effect changes to current provision as suggested by industry and HE constituencies in pursuit of aligning the current HE qualifications and programmes to ensure the supply of dedicated plastics industry engineers, scientists and technicians. Such an undertaking should take the form of a joint venture between the relevant HE institutions and industry stakeholders, with funding, as may be required, provided by industry.

OVERALL Recommendation 3: Against the background of the disconnect that currently characterises Industry–HE relations and collaboration, by and large, and unsuccessful attempts in the past to bridge this divide in any sustainable or lasting ways; Industry Associations, the Plastics Chamber and Plastics SA should devise effective ways to promote engagement and trust relationships-building between HE and industry to collaborate around mutual areas of concern, needs and aspirations – with the ultimate goal of high-level human capital development intervention that will nurture an innovative and competitive plastics industry.

Conclusion
A shortage of technical skills is one of the key problems undermining the competitiveness of the South African plastics sector. The study was conducted in order to focus on the excessive demand of artisans in the plastics sector. A shortage of technical skills is one of the key problems undermining the competitiveness of the South African plastics sector. The malperformance of the South African plastic industry is due to the incompetence in the graduates produced, therefore, stimulating the uptake of engineers in schools and industry would pressurize the potential value-add to company performance by qualified personnel.

Evaluation of the Training Layoff Scheme

Background and purpose

This research was conducted on the Training LAYOFF Scheme (TLS), implemented in September 2009, in response to the global financial crisis. This financial crisis led to job losses in many companies. Social partners such as organised labour, business and government collectively came with a way to respond to this crisis. This scheme provided for firms with an opportunity to retain their workers, place them on a training layoff and work with SETAs to further development their skills.

The focus of TLS was to save jobs and increase worker productivity through various skills development programmes with the hope that companies would have recovered and absorbed their workers. Under the current economic conditions, this research seems relevant with staggeringly high levels of unemployment, brought about by the global pandemic (COVD-19).

The main purpose of this research was to conduct a process mapping and evaluation of the TLS as a retrenchment strategy.

Another purpose was to outline the possible impacts (positive/negative) of having one guideline for the training layoff scheme and the merSETA retrenchment assistance programme (RAP), due to their similarity in objectives.

Methodology

The research design used in this study was mixed methods, combining both quantitative and qualitative research methods research.

Findings and recommendations

Process issues

This research found that the training layoff scheme was not rooted in legislation and without legislation backing, it is difficult to justify spending of state resources e.g. levy and VIF. There is resistance from SETAs to allocate funds for this initiative due to the fact that it is not a legal requirement, nor it is captured in service level agreements between SETAs and DHET.

The Training Layoff Scheme was also not covered by regulation in the government-wide performance monitoring and evaluation framework. Based on this finding it is recommended that:

- The TLS should be incorporated into the legal and regulatory framework governing labour market policies. It should be legitimised and supported by a regulatory framework.
- There should be statues, regulations, directives process to govern and implement the scheme.
- Treasury regulation including public procurement should apply to the scheme.

Design flaws

The design in the structure and process of the scheme rendered it inefficient. There were multiple public entities that act as owners of the scheme but none of them is taking the responsibility of ownership. These include CCMA, UIF, NEDLAC, SETAs etc. The structure of the scheme encourages compartmentalisation (categorization) along the value chain.

Linkages were, at best fragile and detached from upstream and downstream activities in the value chain and this limited the functionality of the scheme.

Recommendations were made that suggests the scheme should be remodelled to increase efficiencies and improve service delivery. The CCMA should be the single owner of the scheme with resources to support it.

Outcome issues

The TLS intended outcomes were achieved as jobs were saved; workers acquired new knowledge and skills, and improved productivity. Between 2009 and

Table: Participation in the TLS (Training Layoff Scheme: Final Consolidate Report, 2018)

Number of:	*Auto	Plastics	Metal	Motor	Total
Participating companies	15	12	46	48	121
Completions	12	8	29	28	77
Training in progress	3	3	8	9	23
Companies liquidated		1	7	2	10
Training discontinued			1	1	2
Training terminated			1	6	7
Application withdrawn				2	2

In 2009 the merSETA only had 5 chambers

2018, 121 companies participated in the scheme of which 77 completed the training successfully. With 18 247 workers participated in the scheme since the inception it was recommended that the structure of the scheme should be re-engineered to ensure that it is widely accessible to potentially retrenched workers rather than the exclusive domain of eligible participating companies.

The scheme should be reconstructed and made more effective and efficient. There was a need to shift the power relationship from the training provider to the worker with the company, ensuring that worker development needs were paramount.

Cost benefit issues

Questions around the viability of the TLS, given the then current economic context were raised and it was found that it was a lengthy process to undergo, but was relatively effective in its purpose. There was very strong approval by merSETA companies for the continuation towards the TLS. Companies that participated in the scheme benefited with improved skills and productivity. Most companies retained workers on completion of their training, indicating the scheme served its purpose of protecting jobs. Companies further benefited from financial relief from the UIF to retain workers.

For TLS to be more efficient there should be comprehensive guidelines and criteria to determine what training should approved/disapproved by learners. The merSETA should outsource career guidance experts to assist learners with choosing training that could best enable them to re-integrate into the labour market.

Training programmes chosen should be demand-driven, instead of supply driven. There should be more flexibility in training offerings as well as monitoring of evaluation of learners and training providers.

PSET Insights

Training, enterprise development and incubation for retrenched workers and people with disabilities

Background

In 2019 the merSETA approved in principle a proposal from a Numsa-led consortium to fund the retraining of retrenched workers and supporting the establishment of viable enterprises to enable sustainable livelihoods. Before proceeding with the project, the merSETA requested a research study to test the feasibility of the project. This research was built on the strengths and challenges of the former Retrenched Worker Assistance Programme (RAP), in which the merSETA had supported retrenched workers to access training and form businesses and cooperatives. Mzabalazo Advisory Services started this research in 2019 and completed the research at the end of 2020. The economic climate in which this research was conceptualised was a response to the challenges and changes occurring in the mer sector.

Retrenchments were happening across the economy with the manufacturing sector being hit hard. From aviation to construction, from entertainment and leisure to hospitality, companies have indicated their intention to retrench staff because of heavy losses incurred, worsened with the impact of COVID-19. In the manufacturing sector, as well as other sectors, companies indicated intentions to embark on retrenchments. This includes large companies in the mer sector such as ArcelorMittal and Brightstone Tyres. This created a need for an urgent intervention to address the training needs of retrenched workers and help such affected people find income generating opportunities, whether in formal or informal employment or in starting an enterprise or cooperative.

Research methods

This feasibility study, was conducted to evaluate the practicality and desirability of the proposed merSETA retrenched worker project. The study was framed into four phases; desktop research, stakeholder analysis, stakeholder engagement and report writing. Each of these phases informed the next phase, in a sequential research design.

The first phase, desktop research, involved mostly analysing research reports and academic articles to understand international best practices on enterprise development including cooperatives and on reskilling of retrenched workers, people with disabilities and youth.

Research was conducted for the stakeholder analysis to examine the various institutions, government departments and entities, as well as private sector organisations, to document the mandate, services offered and/or programmes offered. Following this, a process of engaging stakeholders was initiated to develop an in-depth understanding of the role of entities currently engaged in work to enable retrenched workers, people with disabilities and youth to form businesses and be supported to viability. The final phase was to compilation of the report.

Findings

It was important to determine whether the stated intention or outcomes of the project are realistic and achievable. Extensive research was done through a literature review that demonstrated that the South African government has put in place the essential pillars of an ecosystem that could be expected to achieve significant growth of small businesses.

Some of the significant findings and recommendations from the feasibility study included:

- The Department of Employment and Labour (DEL) is keen to support projects such as this, but the mer sector is one sector amongst many where retrenchments will happen.
- The merSETA project needs to be designed in a manner that enables other sectors to participate and benefit. The Department of Higher Education and Training (DHET) stated that there is agreement on the cluster approach for SETAs (manufacturing cluster), and this should probably be the focus of the project.
- In the engagement with the National Skills Fund, it was advised that there should be more clarity on the roles and responsibilities of stakeholder's involvement in the project (important to adhere to protocol, rather than trying to engage on a sector by sector basis).
- The intention is to explore a joint or inter-departmental approach to the rescuing of businesses, retraining of retrenched workers and supporting enterprises formed by retrenched workers with incubation and other assistance. The DEL has suggested a joint meeting between the Departments of Labour, Small Business Development and Trade and Industry and Competition. The Department of Public Enterprises has also indicated an interest.
- There has to be a market for proposed goods produced, otherwise SMEs cannot hope to succeed. There is a critical need to identify employment and business opportunities in value chains. For example, re-cycling, in this value chain there is: collection; cleaning and preparation; production; marketing and sales.
- Challenges with reintegrating people with disabilities into the labour market has been articulated, and previously there has been limited success in achieving the inclusion that people with disabilities.
- For those wanting self-employment (and have been trained), it is important to have to be in a job for a certain period to gain skill to start their own business.
- Internships and other forms of workplace experience and learning are important.
- There is a need for after care; businesses need to be mentored, to ensure the investment is enhanced.
- Incubation is not a once off intervention, SEDA will have to repurpose incubators for COVID-19 to support the economic recovery strategy that the Minister is driving.
- The Nehawu Investment Holdings (NIH) is working with US unions to put together a $250 million fund for worker owned companies and NIH is keen to work with government departments and SETAs on identifying employment opportunities for retrenched workers, perhaps even rescuing some companies and relaunching them with worker shareholding.
- This is an attractive potential additional focus for the project and both DEL and DTIC have expressed an interest in identifying possible projects. DEL and DITC have expressed the view that the three key departments (DEL, DSBD and DTIC) need to meet to agree a common approach. Bilateral discussions between DEL and merSETA started as early as November 2019 and these have been useful and can continue.

Recommendations

There is strong support for a project to support retrenched workers, and needs to be expedited in the light of the expected effect of COVID-19 on retrenchments. The above findings and recommendation need to be taken into careful consideration. Collaboration across SETAs and across different funding organisations is strongly supported, and the need for trade unions to work together is acknowledged. It is also acknowledged that trade unions will have to play a pro-active role in the project through the facilitation of communication.

With regards to the type of interventions needed: there is a need to develop high skill levels in the light of 4IR, but also to accommodate people that go back to their homes in rural areas to develop skills that can serve the local economies where they live. The project should not be used by employers as a reason or motivation for making retrenchments easier. Retrenched workers should only be involved once the process of retrenchment has been concluded. Non-SA citizens should be included in the project. If a person has the correct documentation to be in the country and to access employment, they must be treated equally if they are retrenched.

Occupational atlas for the merSETA

Background

The purpose of this project was to provide learners, workers, employers and skills planners with a reference guide to occupations and jobs that are in demand in the metals, plastics, auto, auto component, motor and new tyre sectors as defined in the merSETA scope of coverage.

The atlas presents the current situation in terms of demand, insight into occupations that are becoming redundant, as well as provide a future outlook on the skills that will be required to meet the needs of an evolving sector.

The objectives of the research is:
- Understand key occupational drivers in the manufacturing sector currently and what they are expected to become in the future.
- Determine core occupations in the sub-sectors mapped to value chains for manufacturing and how these are changing.
- Construct a matrix of jobs, tasks and job descriptions aligned to OFO.
- Produce an atlas of up to 30 occupations for use within the merSETA.

The research employed a mixed methods approach, consisted of instruments and data sources that paved the foundation for developing the atlas of occupations. Firstly, desktop research was utilised to analyse the international framework, policy documents and International Labour Organisation - occupational classification.

 Secondly, the stakeholder input workshops for each merSETA chamber were conducted, facilitating discussion and asking questions relating to the ecosystem of current occupations and the likelihood of change over time. In addition, Key Informant Interviews were conducted to collect expert knowledge for each sub-sector. Lastly, functional analysis was conducted using analytical framework to review 30 occupations and development of detailed structure of occupational profile and future projection of occupation change.

Structure of the atlas

The atlas is presented by core sub-sector, within which a selected number of core occupation profiles are listed as key to responding to or being impacted by the trends identified.

For each sub-sector, a descriptive summary on the definition, supply chain and major trends impacting the sector are provided.

This sets the context for a series of in-depth individual occupational profiles per sector. The table below list occupations that were profiled in the research and each occupation profile description is explained in detail in the comprehensive report.

Conclusion

This atlas of occupations will enable merSETA stakeholders to increase their understanding of occupations and occupational demands. This atlas can be a tangible tool to monitor occupations that have a decreasing demand; and will be used to plan for potential re-skilling, up-skilling and multi-skilling of workers to meet the emerging opportunities of the labour market.

The atlas creates some sort of baseline for continuous updates and improvements as new developments emerge in the mer sector.

The research also led to the development of a website showing how the occupations are mapped. For further information please visit the website: *http://18.130.52.211/*

Table 1: Atlas of Occupations

Auto	Auto components	Motor retail	Metals	Plastics	New Tyre
Automotive Engineering Technician	Electronic Repair Technician	Actuary	Heavy Equipment Mechanic	Engineering Technician	C&D Engineer
Control Engineering Technologist	Fitter And Turner	Automotive Electrician	Industrial Engineer	Extrusion Machine Operator	Curing And Moulding Engineer
Cost Accountant	Injection Moulding Machine Operator	Automotive Motor Mechanic	Manufacturing Operations Manager	Plastic Mould Setter	ESH Officer
Data Management Specialist	Maintenance Fitter	Automotive Spray Painter	Mechatronic Technician	Chemical Engineer (Plastics)	Marketing Manager
Electrical Design Engineer	Metal Plating Machine Operator	Digital Marketing Specialist	Metal Mechanist	Polymer Scientist	Quality Manager
Mechanical Design Engineer	Plant Maintenance Mechanic	Insurance Claims Investigator	Millwright	Product Assembler	Rubber Production Machine Operator
Operation Manager (Production)	Plastic Mould Setter	Loyalty Programme Manager	Toolmaker	Production Engineer	Rubber Production Technologist
Quality Systems Co-Ordinator	Senior Fitter	Motor Body Repair	Electrical Engineer	Quality Controller	Sales Coordinator
Robotics And Production Automation Engineer	Machine Tool Setter	Motorise Vehicle Salesperson	Industry Machinery Mechanic		Sales Operation Manager
Robotics And Production Automation Technician	Specialised Tooling Mechanist	Sales Manager	Mechatronics Engineer		Supply Chain Administrator
	Toolmaker	Stationary Engine Fitter	Quality Manager		Tyre Evaluation Engineer
	Turner Mechanic	Diesel Mechanic			

Source: merSETA (2020)

Benchmarking of models for training layoff and retrenchment mitigation schemes

Background and purpose

South African government introduced a Training Layoff Scheme (TLS) in 2008, after a severe economic downturn. The scheme was formed by the National Economic Development and Labour Council (NEDLAC), in partnership with the Presidency of South Africa and implemented by the Department of Labour (DoL).

According to the Commission for Conciliation, Mediation and Arbitration (2016) the purpose of the initiative is to ensure that the poor and the most vulnerable are protected from impact of the economic crisis experienced; while ensuring the economy is ready to take advantage of the next upturn, benefiting all through shared growth.

The TLS was introduced to keep a larger percentage of the workforce employed during the economic downturn; but re-skill them as an investment for the future economic recovery.

The merSETA Metal Chamber was responsible for initiating a qualitative research study exploring alternative models of training layoff and retrenchment mitigation schemes through a benchmarking study.

Supporting this aim, the main objectives of this research project were to:

- Review the effectiveness and efficiency of the Training Layoff Scheme in the metal industry
- Identify similar models of retrenchment mitigation schemes successfully applied in other countries
- Make recommendations to either improve the current Training Layoffs Scheme or replace it with a better alternative

Research methods

This project followed a qualitative research approach, where the population consisted of retrenched workers in the metal industry (CCMA, UIF, NSF, merSETA, metal industry). Interviews and focus group discussions were conducted to gather qualitative research data for analysis.

Although the participation was voluntary, the TLS accommodated only companies which were eligible for participation

Summary of findings

The TLS displayed the following strengths:

- Important mechanism within a package of approaches to address job and employment insecurity
- Workers remained employed and received a training allowance (retaining employment and enhancing their skills)
- Supported business in distress and provided an opportunity to turn the business around
- The company's interests were met because it saved on having to pay out severance packages (it is liable for the payment of social benefits) and getting workers back after the layoff period. The increased skills should have positively affected the enterprises' productivity and competitiveness
- The scheme kept the employment contracts intact, which is strategically the most innovative aspect of the scheme. If the workers were dismissed, they would have to try to re-enter employment, which may have created some complexities

On the back of some substantial strengths of the scheme, a number of constraints seemed to impact the full potential of the scheme:

- *Refinement of Scheme* – The TLS lacked scale

and critical mass to make meaningful socio-economic contribution to society. The existing scheme should be improved to increase its effectiveness and efficiency.

- *Legislative backing* – The fundamental constraint to the effective functioning of the TLS is that it is not rooted in any legislative framework, lacking regulations to guide the scheme. It was difficult to compel managing and implementing agents to support the scheme and ensure its success.

- *Lack of integration* – The TLS was not integrated into the other programmes and state organisations supporting laid-off workers in South Africa. Some of the essential state organisations not integrated into this scheme included the Unemployment Fund (UIF) and the Department of Trade and Industry (DTI).

- *Design flaws* – The scheme is beset with design flaws structurally, managerially, operationally and have been widely recognised as a major obstacle in increasing the uptake in the TLS.

- *Monitoring, evaluation and impact* – Reporting processes relating to key performance indicators and targets for the Training Layoff Scheme were not established, and there were no impact assessments to measure the effectiveness of this scheme.

- *Accessibility* – The TLS was accessible only to displaced workers in companies that were approved by the Commission for Conciliation, Mediation and Arbitration (CCMA) to participate. Given that the TLS was used by a fraction of companies in distress, it rendered this scheme as an ineffective labour market response to help potentially displaced workers.

- *Inappropriate training* – There was insufficient attention given to the appropriateness of training for displaced workers, and lack of formal guidelines informing participants what constitutes appropriate training in the TLS.

Recommendations
To address some of the issues mentioned in the findings, the following future recommendations can be made:
1. Integration into the current policy framework
2. Strengthening of the design of TLS (taking these findings into consideration)
3. Incorporating monitoring and evaluation into the TLS
4. Increasing accessibility to a larger pool of potentially retrenched workers, while implementing a more relevant and appropriate training interventions

Along with the abovementioned recommendations for improvements, legislative backing decision makers should consider a layoff scheme as a legal requirement to enable Sector Education and Training Authorities (SETAs) to allocate funds and resources.

Layoff schemes also provide an opportunity for SETAs to work together to create a unified approach to complex circumstances.

Another area for improvement is the increased need for awareness of such layoff schemes to increase participation and buy-in from the companies this scheme is designed to benefit.

Artisan skills imbalances in the metal industry

Background

South Africa is remarkably well-endowed with metals and has been a major exporter of basic metals for more than a century. Despite this, South Africa has not built up a substantial beneficiated metal industry, even with the comparative advantage of metal ore deposits.

For instance, South Africa only beneficiates 15% of its iron ore and 3% of its chrome into finished steel products, while 6% of its platinum group metals into final products, and lastly, 5% of its gold into jewellery (Lundall, Maree & Godfrey, 2008).

There are many reasons why South Africa has not grown their metal industry and increased beneficiation. These include the monopolistic pricing, high electricity costs, import parity pricing and labour costs which have put local firms at a disadvantage.

Another major reason cited for the low level of beneficiation is artisan shortages. The sector's employment intensity remains on a downward trend (IDC, 2019). Firms in the metal industry continue to cite artisan shortages in their plants as an impediment to productivity.

The purpose of this research was two-fold:
*   To assess whether there is a shortage of artisans in the metal industry.
*   To establish how useful is artisan recognition of prior learning (RPL) as a mechanism to address any potential shortage of artisans.

Research Methods

A mixed methods research design was employed to address the research questions. This design involved collecting primary and secondary information using several research methods. This approach allowed for the triangulation of findings based on the weight of research evidence, which would enable a more holistic understanding of the issues under investigation.

Summary of findings

Hard-To-Fill Vacancies (HTFV)

There appears to be an acute shortage of skilled artisans for millwright, lift mechanic, forklift mechanic, fitter and turner, fitter, electrician, earth-moving mechanic, welder, diesel fitter and boilermaker.

The highest recorded shortages were for lift mechanics, fitters, millwrights and earth-moving mechanics. Some of the reasons for this was attributed to a lack of technical competencies, lack of experience, and artisans wanting more money than what was offered.

Measures adopted by companies in the metal industry to counteract the HTFV involved:
*   Providing additional training
*   Appointing people with potential to learn
*   Partnering with training providers
*   Redesigning current work procedures
*   Using untried recruiting practices

Impact of skills gaps

Employers in the metal industry experienced amongst others a decline in productivity, higher production costs, loss of skilled employees due to the consequences of skills shortages. Employers highlighted the following as the most leading causes of skills gaps:
*   Few appropriately experienced and qualified candidates (i.e. a gap in the talent pipeline)
*   The quality of new employees entering the organisation were not up to their expectations
*   Employee skills did not match the production processes and targets

- Insufficient skilled employees in key functions of their organisations

Artisans have shown high employment growth levels in comparison to other occupational groups (professionals, managers, technicians). Overall, employment in the metal industry increased between the years 1999 to 2018. Between 2014 and 2018, 9267 more jobs were created in the metal industry translating to an effective 9% increase in artisan employment.

Recommendations
The following recommendations were concluded from this research:
- There should be a quarterly metal chamber reports on the number of apprenticeships registered in metal trades and number of trade test passes in metal trades
- A Hard-To-Fill Vacancy survey in the metal industry should be administered to companies annually
- A graduate destination survey in the metal industry should be administered to apprentices annually
- Interviews should be conducted with the metal industry expects on skills anticipation needs annually

The following recommendations emanating from the research target the merSETA:
- An institutional skills planning mechanism should be developed to monitor occupational supply and demand across all chambers
- A standardised methodology for all chambers should be applied to measure occupational supply and demand and anticipate future skills needs sub sector-wide
- Research projects should be consolidated sector-wide to ensure comparability and integration of findings from other chambers
- Development of the diagnostic capacity of staff is required to analyse skills demand and supply

Conclusion
The public policy debate has focused on creating a demand-led skills system and how best to match the demand for artisans with the supply of artisans. It is evident that the economy, supply problems and quality are drivers of artisan shortages.

Therefore, a major concern for the economy and firms is ensuring that there is an adequate supply of people with the right skills. In conclusion, in the metal industry the demand for skilled labourers exceeds the supply, thus indicative of an opportunity for skills interventions in the metal industry.

Social Economy

Lived livelihoods: education advancing entrepreneurial livelihoods study

Background

The synthesis report of the Lived livelihoods: Education Advancing Entrepreneurial Livelihoods study was undertaken as a partnership between merSETA and the Research Chair: Youth Unemployment, Employability and Empowerment at Nelson Mandela University. This project started in 2018 and was completed in 2020. The study was initiated against the backdrop of large scale and growing unemployment in South Africa, particularly youth unemployment. Of the 38.8 million South Africans who are of working age, 7.1 million are unemployed and nearly 15.4 million are not economically active either because they are discouraged from finding jobs or because they are involved in caring roles in their family (StatsSA, 2020).

A second aspect of this backdrop is the steady decline in the availability of formal sector jobs and the implication that the private sector alone is simply not able to resolve the jobs crisis. The study further investigates the real experiences of youths who operate informally in the mer sectors, to understand their daily efforts to make a living. Consequently, this research further unpacks the role of education and training for youth employment and empowerment.

Research methodology

The research was explorative in its design and comprised of a mixed methods approach. The research design utilised in this study adopted a Sequential Embedded Research Design. The aim was to capture the lived experiences and perspectives of a small cohort of young entrepreneurs who work in engineering trades and occupations in the informal (solidarity) economy. The research was undertaken in the five phases:

- **Phase 1:** Inception; (groundwork for the project) methodology design, and an in-depth literature review.
- **Phase 2:** Quantitative Community Youth Survey; implementation and analysis.
- **Phases 3:** Qualitative research; six rounds of livelihood diaries implemented as in-depth face-to-face interviews.
- **Phase 3a:** COVID-19 Youth Voices; implemented during the COVID-19 pandemic.
- **Phase 4:** Analysis and synthesis.

Findings

The lived Livelihoods Study was designed as an explorative study that aimed to develop a deeper understanding of the ways in which education and training can better expand and support youth livelihoods as they are lived in the informal study.

The socio-economic context

The biographies of participants mapped out the way(s) in which they experience poverty and how this has impacted and shaped their current reality. These poverties include economic poverty (not limited to it as it also includes not having stable families, experiences of hunger), personal and gendered violence (including rape, sexual abuse and physical abuse) and struggling on a day-to-day basis to survive financially.

Survivalists' vs Competitive Entrepreneurship

Fundamentally, the report makes a distinction between two radically different types of entrepreneurship: 'competitive entrepreneurship' and 'survivalist entrepreneurship'. Competitive entrepreneurship has as its purpose and outcome the production of profit and wealth through creating opportunities to extract surplus value from employees and through innovation. Survivalist entrepreneurship, on the other hand, is orientated towards providing a basic living wage for the individual or the family.

Typology of Survivalists Entrepreneurs

The report indicates that, all the participants are 'survivalist entrepreneurs' who are either earning just enough to meet their basic needs or are needing to have their income supplemented by family members, friends, study stipends or other top-up work. The study produced a typology (tentative as it might be) that distinguished between five different types of survivalist entrepreneurs:

- **Core identity entrepreneurs** see their trade as a core aspect of their life and as central to their identity (informally trained and aspire to work for themselves).
- **Oscillating entrepreneurs** see their entrepreneurship activity as a stepping-stone towards their long-term aspirations for either work and/or education.
- **Scurreller entrepreneurs** adopt short-term strategies to their sustainability (work which is generally precarious and very short term).
- **Community empowerment entrepreneurs** emphasise the wellbeing of their community and the contribution that they can make to develop their community.
- **Second stream entrepreneurs** see their work as an entrepreneur as an addition to a core activity in their life which might be education or work in the formal sector.

Youth Aspirations

Understanding the aspirations for education, work and life are critical for understanding the choices and actions of young people and the ways in which education and training can advance their aspirations. Furthermore, one of the challenges and concerns of the Harvard approach to entrepreneurial education is that it potentially serves to reinforce and entrench these commonly accepted logics whilst ignoring the way(s) in which access to different social, cultural and economic capitals shape(s) one's current and future possibilities.

Recommendations

Improving merSETA's communication with marginalised youth

Firstly, it has been recommended that the merSETA should develop a policy and practice that expands the capacities for inclusive participation which includes providing education and training courses that expand the capacity for democratic participation, enabling informal workers to participate in public deliberations that affect the sector. Secondly, the merSETA should contribute to a culture of transparency and openness by timeously advertising their education and training programmes that are being offered, while enhancing the clarity of the entrance requirements and due date (making it easier for youths to apply, possibly enhanced through the use of a free data website).

Key research insights that have emerged

The merSETA takes cognisance of complexity that exists in the informal sector by noting that they are not dealing with a homogeneous population. Ignoring differences in capitals, aspirations and capacity risks developing education and training solutions that simply have no traction or no meaningful impact on the wellbeing of the young people's lives. Furthermore, the challenge of education and training not understanding the different types of survivalist entrepreneurship provided in the typology developed can lead to the education intervention not aligning in mode, content or orientation to the aspirations and life realities of the particular type of survivalist entrepreneur.

Demand for access to education and training

The suggested approach for the demand of access to education and training involves increasing opportunities for occupational training available at TVET colleges, while engaging with the possibilities for blended learning. Furthermore, while considering the possibilities for blended learning and micro-credentials the merSETA can also develop an entrepreneurship programme for survivalist entrepreneurs.

Recommendations for future research

The suggested research approach constitutes of utilising existing skills as opportunities for on-the job skills, since research recognises the skills in real business acumen, creativity, dynamism and innovation. In addition, the research suggests, understanding the skills eco-system that exist in motor mechanics working in the informal sector. Also to discern the possibilities for better understanding the skills that that young people are drawing on, the ways in which these skills are shared and the implications that these have for skills development (particularly in TVETs) going forward.

Labour, Skills Demand and Supply in merSETA's formal, SMME, cooperative and informal sectors

Background

Manufacturing has been through difficult times; production has fallen since 2001 by as much as 20% and employment has dropped by a staggering 82,728 (until 2014).

The stagnation of the South African manufacturing sector is primarily because 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 is unable to move up the value chain and produce sophisticated manufactured products.

The merSETA wanted to identify strategic skills development opportunities within different enterprise segments in relation to demand and supply for labour and skills, as part of its overall research agenda.

To inform opportunities for skills development the merSETA needed to gain an understanding of the nature of business in the formal, SMME, Co-operative and informal enterprise segments of the manufacturing, engineering, and related services sector. This quest for understanding required the merSETA to assess skills needs and enablers of relevant skills interventions for business growth.

The merSETA also required an understanding of relevant economic, labour market and policy drivers impacting on skills labour and skills demand and supply to enable appropriate skills development interventions that would contribute to employment creation and community development.

Mzabalazo Advisory Services was appointed as the service providers to implement a regional based research project focused on large, medium, small, cooperative, and informal enterprises operating within the merSETA scope of coverage for Region 1 (Gauteng, Mpumalanga, North-West and Limpopo).

Methodology

This was study intended to incorporate all chambers, across provinces in Region 1, as well as both formal and informal businesses. This research used a mixed methods approach (quantitative and qualitative data collection) through a desktop study, surveys, focus groups and interviews.

Sampling for the interviews and focus groups were relative to the size of the province (population of province) and the population of the chambers (number of companies and representatives).

Key Findings (Region 1)

Based on secondary literature from the desktop study, stakeholder interviews, employer and training provider surveys and a survey targeting the informal sector, one 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 (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 that will enable them to respond with more flexibly to a larger range of stakeholders.

Recommendations & conclusion

Taking into consideration the nature of skills demands, which are driven both by political and economic factors, the merSETA consider a range of factors. On the economic front, the mer sector has been on a backfoot especially in those chambers that have had to compete with cheap imports (metals, plastics and new tyre).

This has resulted in a constrained demand on employment, particularly for semi-skilled workers. This resultant 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 the mer sector) 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.

Based on the diversity of organisations that participated in the research it is perhaps not surprising therefore that there are divergent views on the direction the mer sector 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. For this to be effective employers need 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
• The SETA will also need to mediate opportunities for workers retrenched
• There is also a need to build capacity in the SETA to grapple with the complexity of the challenges facing the manufacturing sector

There are several ideas arising from this study on how the merSETA could support more efficient manufacturing:
• Invest in upgrading artisans into 'master' artisans
• Concentrate on producing production specialists
• Invest in training auxiliary or specialised skills.
• The SMME sector is an important focus for government policy yet it appears that SMMEs in the mer sector have struggled to survive and many have closed shop (especially in metals).
• 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.

There were also ideas brought up by stakeholders through this study on how to expand manufacturing:
• Support localisation through developing skills in mer sector 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).
• Support SMMEs to take advantage of beneficiation (especially in the metals sector).
• Invest in high-level skills in research and innovation.

COVID-19

Impact of COVID-19 on occupations and skills in the mer sector

During the initial lockdown in South Africa in 2020, a number or changes occurred amongst companies operating in the mer sector. This section attempts to identify these changes regarding Hard to Fill Vacancies (HTVs), skills gaps and productivity. The data used for this analysis was collected from Workplace Skills Plans, Annual Training Report (WSP/ATR) along with a survey and focus groups and workshops. Table 1 below illustrates the top ten HTFVs in the overall mer sector before the COVID-19 lockdown in South Africa, which government instated on the 26th of March 2020.

The HTFV were also identified through the duration of the lockdown and occupation and skills needs, which changed as work had to be adapted to fit the demands of lockdown, which prioritised social distancing.

This forced the country to either suspend work or to adopt alternative ways of work, including working from home and using virtual and online means to communicate and convey information. The normal way of work has been disrupted, possibly forever.

Table 1: HTFVs identified through the duration of the national lockdown levels

	Pre-Lockdown	Level 5	Level 4	Level 3
1	Diesel Mechanic	Diesel Mechanic	Motorised Vehicle or Caravan Salesperson	Motorised Vehicle or Caravan Salesperson
2	Panel Beater	Metal Processing Plant Operator	Engineering Production Systems Worker	Engineering Production Systems Worker
3	Automotive Motor Mechanic	Automotive Motor Mechanic	Automotive Motor Mechanic	Automotive Motor Mechanic
4	Boiler Maker	Metal Machinist	Fitter and Turner	Mining Blaster
5	Metal Machinist	Fitter and Turner	Sales Manager	Sales Manager
6	Transportation Electrician	Panel Beater	Corporate General Manager	Steel Fixer
7	Electrical or Telecommunications Trades Assistant	Sales Manager	Diesel Mechanic	Boiler Maker
8	Business Administrator	Boiler Maker	Millwright	Corporate General Manager
9	General Clerk	Automotive Parts Salesperson	Diesel Mechanic	Welder
10	Patternmaker	Metallurgist	Metal Machinist	Automotive Parts Salesperson

Before lockdown, and during level 5, there was nearly no movement or occupation of physical spaces permitted. The vacancies the industry identified as hard to fill mostly remained the same as the demand indicated prior to the pandemic. In levels 4 and 3, when restrictions were beginning to be lifted and movement and operations in some industries were permitted, skills or occupations that would be needed to survive the rest of the lockdown and the post-COVID era were beginning to emerge and made the HTFV list. In Table 1 above we see that the priorities of which occupations needed to be filled shifted the longer the lockdown went on and also when fewer restrictions were applied.

Salespersons for motorised or caravan vehicles and engineering production systems works became important in the later lockdown levels, whereas they were not identified as HTFVs before the lockdown. Sales- and management-related occupations became a priority as production slowed down and companies had to rely on sales for business and profits.

Skills gaps

In terms of skills gaps, WSP/ATR data provided the key skills gaps identified for each chamber across the various occupation levels. These are presented in the individual chamber reports. In the first set of focus group sessions, merSETA stakeholders validated the findings that came through the WSP/ATR data and indicated that soft skills are gaining prominence in the overall sector.

The following soft skills were identified as key skills gaps in the sector.
• Management and leadership
• Ability to understand and work with financial information
• Personal discipline required as a result of working from home
• Change management skills, transformation, and diversity management
• Legal, governance and risk matters

It was also highlighted that COVID-19 brought to the fore skills that enable workers at various levels to better engage with computers and digital technologies.

Digital skills will be needed to analyse macro data for trend analyses and strategic planning; and Original Equipment Manufacturers (OEMS) require the ability to interpret and engage with research/recommendations from mother companies, typically situated in the First World. Computer skills are needed in general. Trainers will do their work in a non-contact environment going forward, which requires virtual training, blended learning, and computer and computer-based communication skills.

The reasons listed were cited for the skills gaps across all six chambers (Auto Manufacturing, Auto Components Manufacturing, Motor Retail & Aftermarket, New Tyre Manufacturing, Plastics Manufacturing and Metal & Engineering). These reasons are in line with the impact of the COVID-19 pandemic, which requires new work processes to be rapidly adopted in many industries to remain sustainable in the future.

New products and new technology are required for participation in the Fourth Industrial Revolution (4IR) while having the relevant qualifications and experience are standard requirements for skills gaps in many sectors, particularly those that are largely made up of formal sectors and requires semi-skilled to skilled labour.

Focus group participants recommended the following for the merSETA sector to "work through" COVID-19 and beyond:
1. Preparing and capacitating training providers to work in a virtual world. While this training is important at the company level, the SETA should prioritise capacitating public TVET colleges.
2. Adjust the learning environment to be aligned with the realities of a virtual world.
3. A temporary increase in grant assistance offered to companies.
4. A temporary extension of contract validity with regard to training interventions such as apprenticeships, learnerships and some skills programmes.
5. Ongoing research on 4IR impact on training interventions, curricula and the administration thereof.

In an interview with a DHET representative, it was mentioned that SETAs are encouraged to partner with relevant initiatives, such as the Strengthening Entrepreneurship and Enterprise Development (SEED), to further provide assistance for funding TVET graduates, for example. SETAs should also more actively monitor the progress of funded learners toward their entrepreneurial efforts. This is supported by the Auto Manufacturing and Motor Retail and Aftermarket chambers, which stated that more localisation efforts are needed to assist lower-skilled individuals to develop sustainable new businesses or informal activities.

The focus should move towards assistance with start-up capital and cooperative development. However, it was mentioned that DHET realises that it is important that SETAs do not dilute their targets in striving to achieve current demands; SETAs' actions should be aligned with policies. The DHET foresees that learning and training will move to skills programmes that can fill current or immediate needs; shorter programmes and fewer formal qualifications will be in demand. Companies and SETAs should support online learning towards this end to ensure that current learners can complete their learning and work-integrated learning (WIL) programmes.

Impact of covid-19 and other change drivers

This section describes the economic impact of the COVID-19 pandemic, with a specific focus on the impact on the overall manufacturing sector. Insights were drawn from secondary research, focus group discussions with industry and an Urban-Econ survey on enterprise impact.

Impact on global and South African economy

The COVID-19 pandemic has restricted earning capacity and productivity levels for many sectors, including the manufacturing and engineering and related services (mer) sector.

A focus group workshop concurred that the sector had been hit hard by the pandemic. However, the participants also indicated that the mer sector had not been in a positive situation prior to the pandemic.

Many changes and interventions implemented at the time of the focus group workshop (August 2020) were in the pipeline or were needed for the sustainability of the sector in the long run. During lockdown level 3, focus group stakeholders indicated that many companies were building up production volumes as social distancing restrictions were eased.

However, orders were described as volatile and erratic, frequently resulting in 'knee-jerk' reactions from companies. Most sub-sectors were not operating at full capacity at the time of the focus group workshops, Plastics in particular. Moreover, several dealerships have closed down or have merged in an effort to survive, and this reflects in the Motor Retail and Aftermarket sub-sector. The Automotive Components Manufacturing sector, as well the New Tyre sub-sector, were reliant on a half-capacity and short shifts. While original equipment manufacturers (OEMs) moved from a 24-hour/three-shift production to a two-shift production cycle.

The workshops also indicated that Section 198 retrenchments may be necessary for some companies. However, efforts were being made to protect jobs and employment, with 250 000 jobs lost in the mer sector between Quarter 1 and Quarter 2 in 2020. As an example, the Auto Manufacturing sub-sector placed permanent staff on a two-shift production cycle while the third shift was on a lay-off, implemented on a rotational basis. In this manner, the retrenchment of workers was avoided. This was supported by the findings of the COVID-19 survey conducted by merSETA, which showed that retrenchments were only the third-most common cited effect on employment.

There was, however, a strong urge for the merSETA to lobby ongoing support from COVID relief programmes for the sustainability of the sector in the short term. More positive observations emanating from the workshops: the Plastics industry was not as badly affected; many players were able to shift to manufacturing personal protective equipment (PPE). Other industrial activities within the plastics sub-sector that have fared well are irrigation, which is linked to agricultural production, and consumer

bottling, which has benefitted from the alcohol sale ban, because consumers switched from alcohol consumption to soft drinks consumption during hard lockdown levels.

A positive in the Motor Retail and Aftersales sector was that workshops and service centres were operating at near-full capacity. In the New Tyre Manufacturing sub-sector, sales of new tyres in the informal sector were strong, although the reasons for this was not fully understood.

Two other factors were listed as noteworthy during the workshops:
1. The steel masterplan and other masterplans (such as the plastics industry plan) is a reason for optimism and the launch of these in September 2020 was eagerly awaited. It is believed that these masterplans will create new opportunities for growth in the sector. The merSETA is strongly encouraged to engage deeply with these masterplans, to integrating its planned efforts with what the masterplans intend to achieve.
2. A second important observation was that the merSETA should consider investigating in the resilience amongst small businesses, especially those that have been in existence for more than two years. It has been noted that the extent to which small businesses have found ways to survive and their level of agility bode well and need to be understood fully so that the correct support can be offered by the merSETA.

Based on the feedback received from the focus groups, feedback ranged widely on how long it will take the sector to recover (from 18 months to 15 years), a time frame of two years presents itself as the median.

1.3.2 Impact on manufacturing
This sub-section details the results of the merSETA COVID-19 Enterprise Survey conducted in June 2020. For the accuracy of reporting the collected data, respondents from merSETA staff and those respondents who were not aligned with the merSETA SIC codes were categorised as 'n/a' and excluded from all analyses.

The Figure 1 below speaks to suspended operations by enterprises surveyed (n=535) in the mer sector at different lockdown levels.
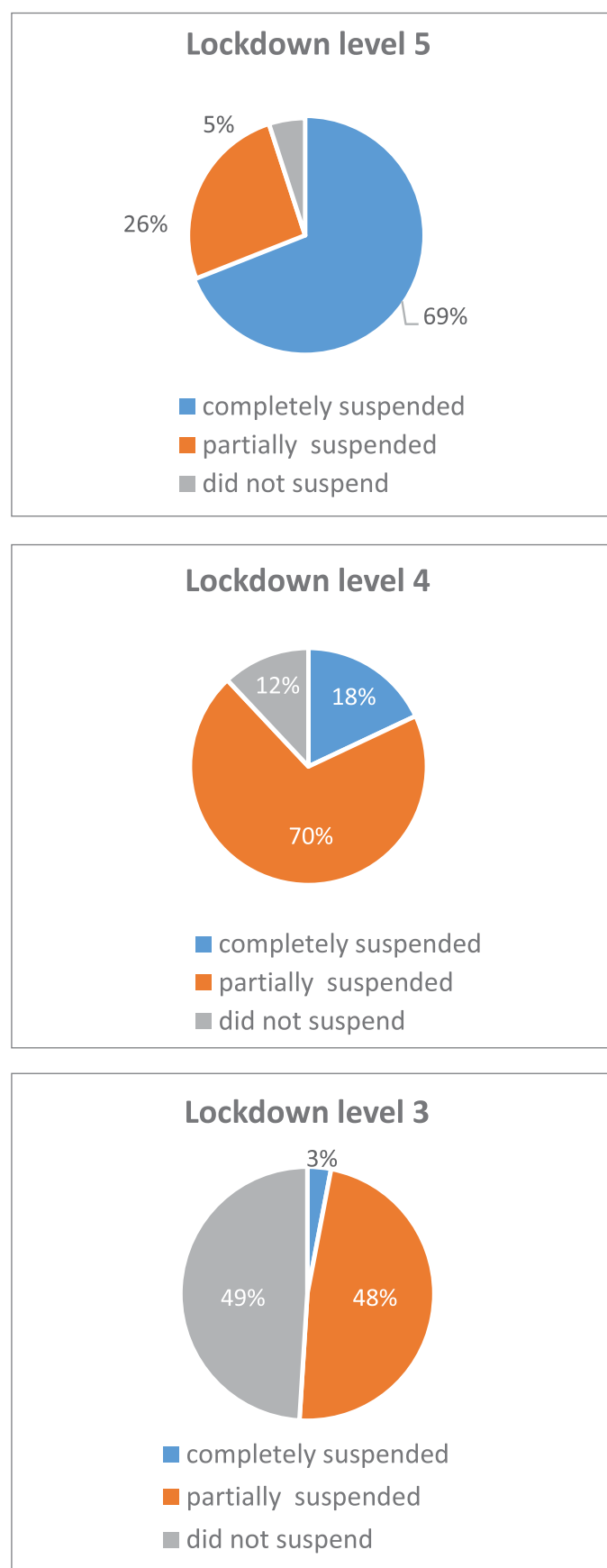
Figure 1: Suspended operations during different levels of lockdown

According to the survey, in the initial lockdown stage (level 5), nearly 70% of companies completely suspended operations. In lockdown level 4, only 18% of companies indicated completely suspending operations, and 70% indicated that they partially suspended operations.

The ease of COVID-19 safety measures helped businesses obtain some normalcy in terms of operations and production. In lockdown level 3, when most severe restrictions were lifted and industries were open for business, most companies in the mer sector were operating, with only 3% (n=15) of companies indicating that operations were still completely suspended.

When asked whether their enterprise instituted work-from-home (WFH) measures during the lockdown, respondents answered the following:
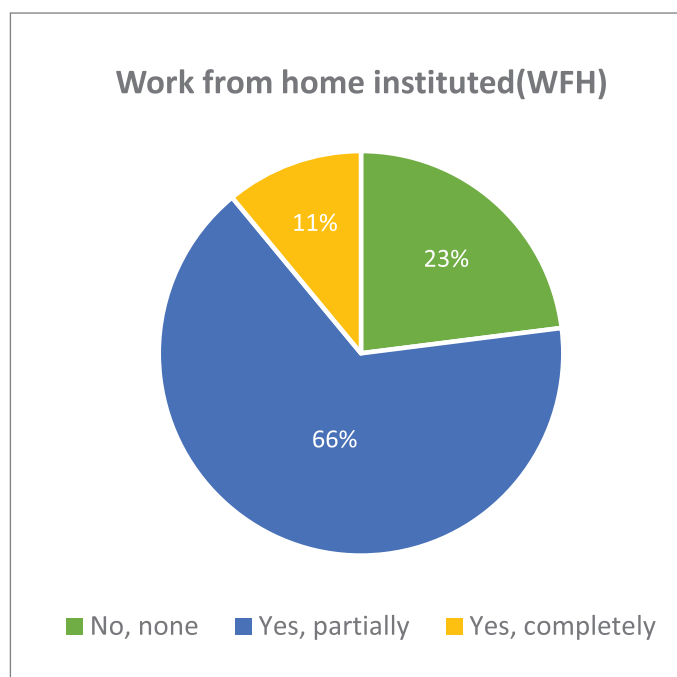
Figure 2: Work from home (WFH) instituted

The majority (66%) of companies in the survey indicated that they could partially move operations to a work-from-home policy (see Figure 2), while fewer (23%) could not work from home and only 11% could completely move to a WFH policy. Larger enterprises (more than 150 employees) were the most capable to move operations to WFH.

Figure 3 below indicates the business risks which companies faced during the lockdown levels under review (levels 5 to 3).
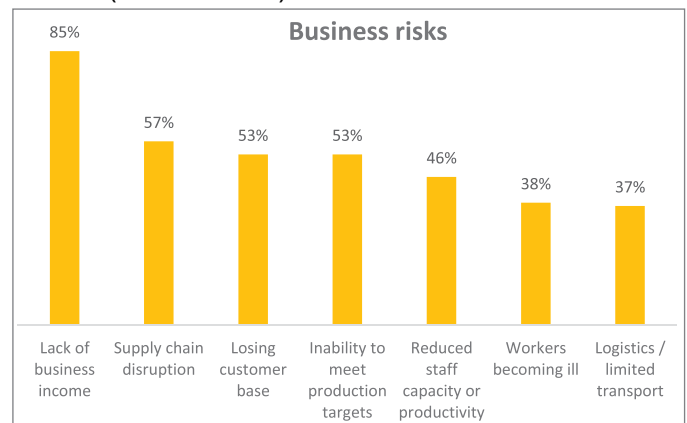
Figure 3: Business risks

The majority (66%) of companies in the survey indicated that they could partially move operations to a work-from-home policy, while fewer (23%) could not work from home and only 11% could completely move to a WFH policy. Larger enterprises (more than 150 employees) were the most capable to move operations to WFH.

According to survey responses, enterprises were, in general, most affected by a lack of income during the lockdown. Over 90% of small companies, 84% of medium companies and 76% of large companies indicated this as a high risk. Small companies were also more severely impacted by a smaller customer base, a reduction in staff/productivity, and an inability to meet production targets. Large and small companies faced supply-chain disruptions as a high risk, and mostly medium companies indicated workers becoming ill as a higher risk.

Figure4 below indicates the effect which the lockdown had on employment in the sector. These responses below are based on the number of times respondents indicated the factor/impact as impactful.
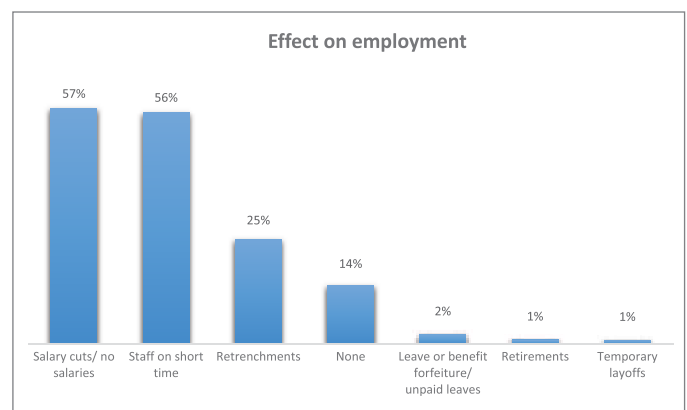
Figure 4: Effect on employment

According to the survey, companies in the sector were mostly affected by salary cuts and having to put staff on short time. Medium and small companies mostly undertook putting staff on short time and implementing salary cuts, while large companies mostly indicated undergoing retrenchments.

Mostly large companies indicated 'none' or no impact. Organisations' employment across all sizes were the least affected by the least-indicated factors/impacts, with medium-size enterprises having more temporary layoffs than the others. Overall, 50% of the companies believed that recovery in the next three months was somewhat possible. 46% of companies believe that business will likely take more than a year to recover. All the companies believed that a recovery was possible.
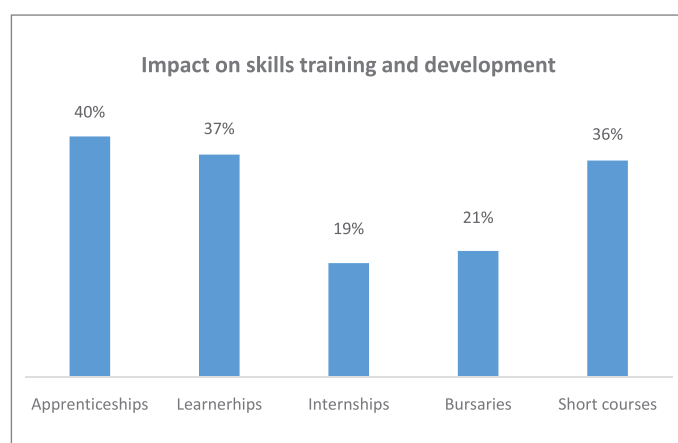
Figure 5: Impact on skills training and development

Figure 5 indicates the impact the pandemic had on skills training and development. More large and small companies indicated that they had to completely halt staff training programmes during the lockdown.

Overall, large companies mostly indicated that they would require support in all skills interventions. 66% indicated that they would require support with learnerships, 51% apprenticeships, and 46% short courses. Additionally, 54% of enterprises had taken measures to continue training staff during COVID-19; while 59% of enterprises have taken measures for new training programmes in response to COVID-19.

The types of support that companies indicated they require are listed below from most cited to

least cited. These needs include the training and support activities of training providers/educational institutions, associations, trade unions, bargaining councils, BEE/other consultants, and consulting engineers.

According to data collected from the survey, respondents mostly need support with adjusting contracts or timeframes of skills interventions to accommodate delays brought on by the pandemic. Support with funding, resources, and suspension of training, as well as online or alternative training approaches and processes, were needed, too.

Large companies mostly indicated needing support with contract extensions or timeline extensions, while medium and small companies mostly indicated a need for funding or resources.

The figure below describes the types of new training programmes which respondents envisage the sector might need. These are listed from most cited to least cited (See Figure 6).
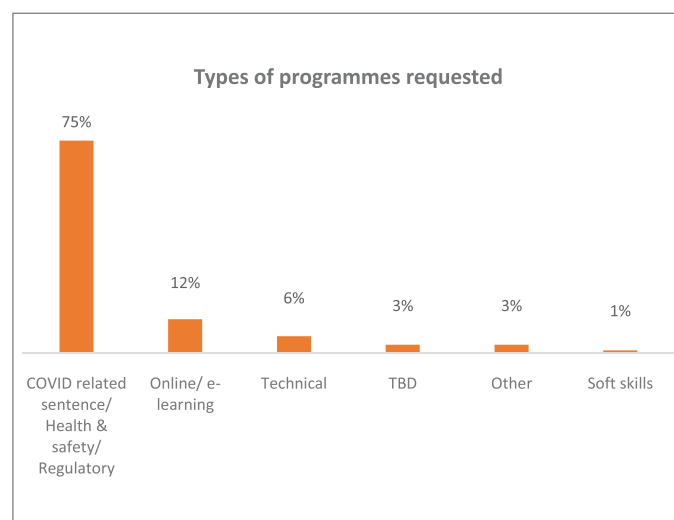

Figure 6: Types of new programmes

According to the responses, enterprises regard COVID-19-related, health and safety and regulatory training as important additions to new types of training programmes going forward.

Large and medium companies emphasised online and e-learning as important, while smaller companies listed technical training in second place of new types of training programmes needed in the sector.

Figure 7 below describes the use of distance learning tools before COVID-19 for those who made use of them. The responses were based on many how times the selection/tool was chosen.
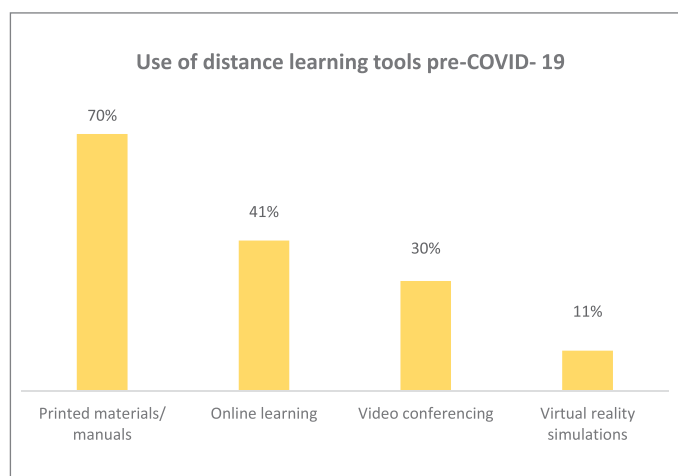
**Figure 7: Use of distance learning tools (pre-COVID-19)**

Based on the responses, Figure 8 (below) lists the main challenges which enterprises experienced in delivering training programmes during the initial lockdown levels of the pandemic. The responses listed are the main challenges cited.
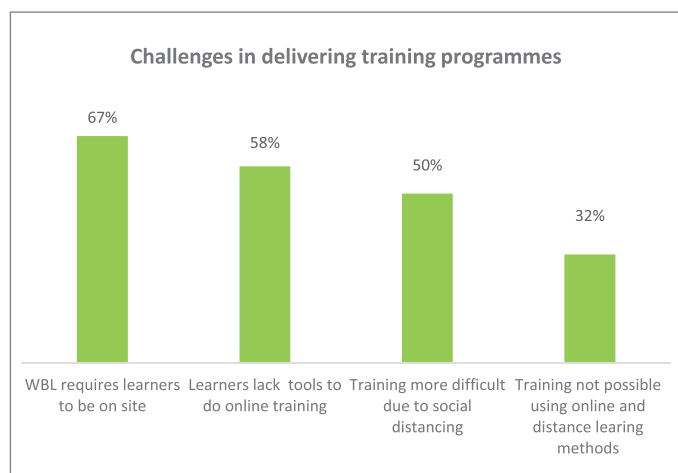
Figure 8: Challenges in delivering training programmes

Most companies found it a challenge to continue training onsite due to the requirements of social distancing and other related lockdown measures. For the mer sector, specifically, contact training and onsite work are crucial, making it a considerable challenge for companies to conduct training programs during lockdown restrictions. Another significant challenge was the lack of access to tools required for online training by learners. When asked whether they could continue to deliver training in the next six to 12 months, respondents conveyed the following.
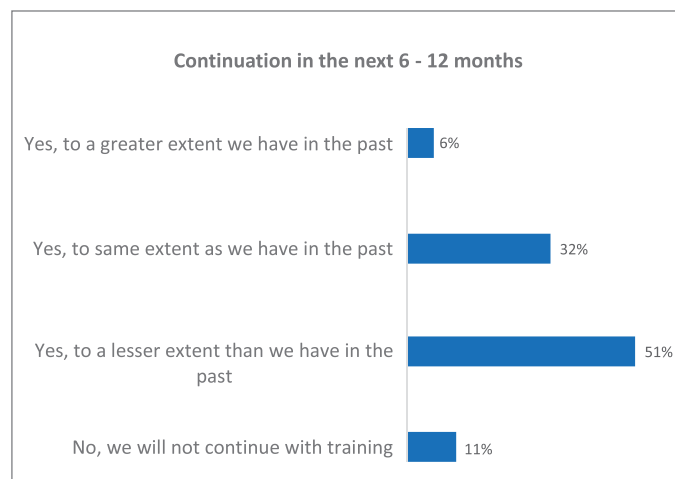
Figure 9: Contribution of training in the next 6-12 months

Most of the respondents were positive that they will be able to continue delivering training to learners in the next 6–12 months, even though training would occur at a 'lesser extent'. Mostly small companies indicated that they would not be able to deliver training in the coming months.

In terms of resources needed to continue training, 36% of respondents indicated that they needed assistance with learner stipends; 64% did not indicate this as a resource need.

Figure 10 (below) shows in more detail the resource needs indicated by respondents and the percentage of respondents who claimed they needed assistance for said resource.
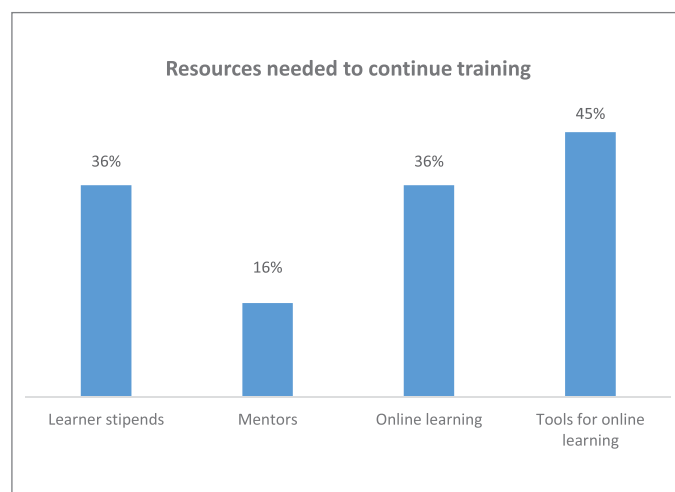
Figure 10: Resources needed to continue training

Most of the respondents indicated that they needed assistance with tools for online learning to continue training, followed by assistance with learner stipends. Overall, large companies indicated a greater need for online learning resources.

Respondents indicated the types of interventions to prioritise in the next six to 12 months; these are listed below in order of most important to least important:
•   Technical / learning programmes
•   Health and safety / compliance
•   Online / e-learning
•   Short courses / soft skills
•   Internal training
•   Digital skills
•   Reskilling

Based on the above list, the interventions respondents indicated were the most important to prioritise in the next 6–12 months. Technical and/or learning programmes received the most responses, which shows that the industry is focused on returning to normal as soon as possible. Mostly large and small companies indicated this as a priority.

There was also a strong focus on health and safety and other regulatory requirements for companies in this time; medium companies mostly indicated this as a priority. Overall, new ways of learning and topping up on skills were listed as important, too.

Drivers of Change and Other Factors

Table 2 lists the key change drivers and the factors considered to be impacted by the COVID-19 pandemic, an evolving nature of work, and other emerging trends. The drivers of change and other factors listed here supplement those captured in the merSETA SSP Update 2021/22 and were highlighted in focus group discussions with chamber stakeholders.

Drivers of change and other factors

Drivers of change and other factors MANUFACTURING, ENGINEERING AND RELATED SERVICES SECTOR	
Key change drivers	**Factors and impact**
4IR and digitisation	The consensus is that **COVID-19 accelerated the drivers that will change economies.** The industry masterplans for the sector will clearly outline the change drivers.
Remote work	
Emerging types of training provision: • Virtual training • Remote learning	The Motor Retail and Aftersales sub-sector believes that electric and LPG powered cars will have an impact on after-sales service, maintenance, and technical requirements. Automation will become prominent in the Metal and Engineering sub-sector. More computer-based technologies will be adopted in the New Tyre sub-sector. OEMs will have to find a balance in work division between the ever-increasing presence of robotics and the workforce. The COVID-19 pandemic has also introduced less travel and more **virtual work and engagements;** this norm is likely to remain and must be understood and managed by the mer sector. **Virtual training and remote learning** will also remain, and training providers (public and private) must be capacitated to work effectively in this environment. Curricula and learning material need to be adjusted accordingly to suit the virtual environment of the future. Learners must also be empowered to benefit from this with access to data, platforms and learning material/forms of simulation to supplement, and in some cases, replace WIL.

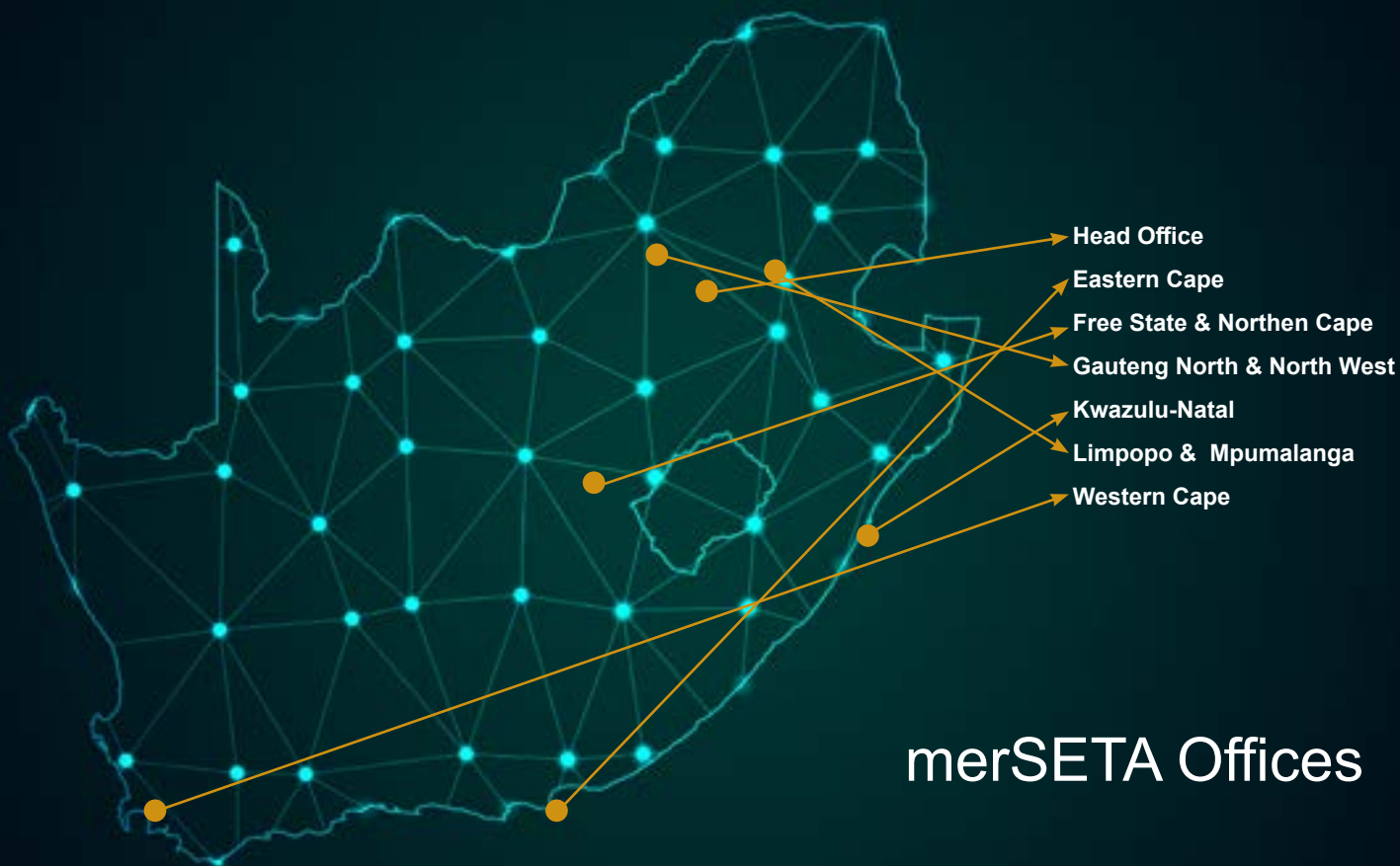**WE CARE**
It's about caring for people
we render services to

WE BELONG
It's about working together
with colleagues

WE SERVE
It's about going beyond
the call of duty

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