Mining Future Skills

MINING QUALIFICATIONS AUTHORITY

Final Sector Skills Plan Update 2026-2027

FOREWORD

The South African mining and minerals sector (MMS) remains a cornerstone of our economy. Yet, in a rapidly evolving global landscape, ensuring a skilled and competent workforce is more critical than ever. Building on the strong foundation laid in the previous Sector Skills Plan (SSP), the Mining Qualifications Authority (MQA) is proud to present this roadmap for the future – the 2026-2027 SSP Update.

In line with the National Development Plan (NDP), 2024 -2029 Medium-Term Development Plan (MTDP) and the 2030 National Skills Development Plan (NSDP), this SSP goes beyond simply identifying skills gaps. It acknowledges the transformative power of automation, digitalisation, and other emerging technologies, ensuring our workforce possesses the necessary skills to thrive in a technology-driven future. This is in accordance with Strategic Priority 1 (Inclusive growth & job creation) and Strategic Priority 2 (Reduce poverty and tackle the high cost of living) of the MTDP. Furthermore, in line with these priorities, the SSP embraces the imperative for a just transition to a low-carbon and climate-resilient economy, outlining strategies to equip the workforce with the skills needed for sustainable mining practices. The evolving geopolitical landscape, with its growing demand for critical minerals, is also considered. The SSP anticipates these shifts, ensuring our workforce is prepared to capitalise on new markets while maintaining global competitiveness.

The development of this SSP reflects extensive collaboration with key role players. This includes government departments, state-owned entities, research institutions, professional bodies, and others who play a crucial role in the sector's success. Through these role players, the MQA remains dedicated to achieving several key goals.

Firstly, we remain steadfast in our commitment to a "zero harm" sector. This SSP outlines initiatives to foster a culture of safety and equip workers with the necessary skills to minimise risks and ensure a healthy and productive workforce. Secondly, the MQA is committed to building a diverse and inclusive mining sector. This SSP focuses on expanding access to skills development opportunities, particularly for historically disadvantaged groups. Finally, the SSP recognises the need for a skilled workforce that can drive innovation and optimise mining operations. It proposes strategies to bridge the gap between theoretical knowledge and practical application, fostering a culture of continuous improvement.

More than just a blueprint, this SSP serves as a roadmap for the future of skills development in the South African mining and minerals sector. By implementing the strategies outlined within, we can ensure a future where a skilled and empowered workforce propels the MMS towards a sustainable and prosperous future. Together, we can build a mining industry that is not only economically strong but also environmentally responsible and socially just.

……

Dr Thabo Mashongoane

MQA Interim Accounting Officer

Date:……./…./2025

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS

Acronym	Description	Acronym	Description
AET	Adult Education and Training	AMMSA	Association of Mine Managers of South Africa
AMSA	Artisanal and Small-Scale Mining	AgriSETA	Agriculture Sector Education Training Authority
APP	Annual Performance Plan	APR	Annual Performance Report
ARPL	Artisan Recognition of Prior Learning	ATI	Artisan Training Institute
ATR	Annual Training Report	CAGR	Compound Annual Growth Rate
CET	Community Education and Training	CETA	Construction Education and Training Authority
CHIETA	Chemical Industries Education and Training Authority	CIP	Continuous Improvement Plan
CLAS	Cement, Lime, Aggregates and Sand	COVID-19	Corona Virus Disease 2019
CSIR	Council for Scientific and Industrial Research	DBE	Department of Basic Education
DEDT	Department of Economic Development and Trade	DHET	Department of Higher Education and Training
DMPR	Department of Mineral and Petroleum Resources	DTI	Department of Trade and Industry
EAC	Education and Advisory Committee	EIA	Environmental Impact Assessment
EMIS	Education Management Information System	ERRP	Economic Reconstruction and Recovery Plan
ETDPSETA	Education, Training and Development Practices Sector Education and Training Authority	ESG	Environmental, Social, and Governance
FGDs	Focus Group Discussions	FLC	Foundation Learning Skill
GCC	Government Certificate of Competency	GDP	Gross Domestic Product
GSC	Governance and Strategy Committee	HDSA	Historically Disadvantaged South African
HEMIS	Higher Education Management Information System	HET	Higher Education and Training
HRD	Human Resource Development	HTFV	Hard-to-fill Vacancies
ICT	Information and Communication Technology	IDC	Industrial Development Corporation
JET	Just Energy Transition	JETF	Just Energy Transition Framework
KPIs	Key Performance Indicators	M&E	Monitoring and Evaluation
MEMSA	Mining Equipment Manufacturers of South Africa	MerSETA	Manufacturing, Engineering and Related Services Sector Education and Training Authority
MHSA	Mine Health and Safety Act	MHSC	Mine Health and Safety Council
MMS	Mining and Minerals Sector	MoU	Memorandum of Understanding
MTDP	Medium-Term Development Plan	n	Sample size
N	Population size	NDP	National Development Plan
NCV	National Certificate Vocational	NGO	Non-governmental Organisation
NEET	Not in Employment, Education or Training	NQF	National Qualifications Framework
NLRD	National Learners' Record Database	NYDA	National Youth Development Agency
NSF	National Skills Fund	OHS	Occupational Health and Safety
OFO	Organising Framework for Occupations	PIVOTAL	Professional, Vocational, Technical and Academic

Acronym	Description	Acronym	Description
			Learning
OQSF	Occupational Qualification Sub-Framework	PMF	Partnership Management Framework
PGMs	Platinum Group Metals	QCTO	Quality Council for Trades and Occupations
PYEI	Presidential Youth Employment Initiative	R&D	Research and Development
QLFS	Quarterly Labour Force Survey	RPL	Recognition of Prior Learning
RDI	Research, Development and Innovation	SAIMM	Southern African Institute of Mining and Metallurgy
SAF	Sustainable Aviation Fuels	SDA	Skills Development Act
SASME	South African Small and Medium Enterprises	SETMIS	Sector Education and Training Management Information System
SETA	Sector Education and Training Authority	SIC	Standard Industrial Classification
SHE&Q	Safety, Health, Environment and Quality	SMME	Small, Medium and Micro-sized Enterprises
SIHIP	Seta Integrated High Impact Programmes	SOPA	State of the Province Address
SONA	State of the Nation Address	SIP	Strategic Implementation Plan
SP	Strategic Plan	SSP	Sector Skills Plan
SSM	Small Scale Mining	STEM	Science, Technology, Engineering, Mathematics
Stats SA	Statistics South Africa	TVET	Technical and Vocational Education and Training
TETA	Transport Education and Training Authority	UNISA	University of South Africa
UIF	Unemployment Insurance Fund	WIL	Work Integrated Learning
VAT	Value-Added Tax		

EXECUTIVE SUMMARY

The MQA, responsible for administering skills development in South Africa's mining and minerals sector (MMS), developed the 2026-2027 Sector Skills Plan (SSP) Update aligned with the national framework set by the Department of Higher Education & Training. This SSP acts as a roadmap, identifying the skills needed and outlining specific actions to build a highly skilled MMS workforce. It provides a comprehensive analysis of the sector's profile (key role players, employer profile and labour market analysis), change drivers, occupational shortages and skills gaps, SETA partnerships, and M&E. The plan culminates in proposing skills priority actions. These actions outline an approach to address skills demand in the MMS.

Economic Performance

The economic performance analysis revealed the fluctuating nature of the MMS, with commodity prices and production volumes impacting job security. A significant challenge is the large number of unemployed people, particularly those not currently in education, employment, or training (NEET). This untapped potential represents a missed opportunity for both the workforce and the sector itself, affecting the skills pipeline. While the MMS has created jobs and employs a substantial, retrenchments highlight the need for continuous skills development to ensure job security.

Employer and Employee Profile

The SSP paints a detailed picture of the MMS workforce. Gauteng, houses many head offices, leading to a skewed geographical distribution of employers indicating that they are based in the province. Interestingly, the majority of registered mines are small companies, highlighting the need for skills development programs tailored to their specific needs.

PGM mining employs the majority of the MMS workforce. The age distribution indicates that the workforce is maturing, with the largest age group being 36-44 years old. This indicates a significant portion of the workforce approaching or in mid-career stages, with potential skill gaps emerging as they approach retirement. While women are increasingly represented (20.2%), achieving gender and racial diversity, as well as integrating people with disabilities, remains a challenge.

Key Skills Change

The MMS is undergoing significant transformations. Technological advancements such as automation and data analytics necessitate a workforce equipped to operate and maintain these new technologies. The growing importance of Artisanal and Small-Scale Mining (ASM) and mineral beneficiation requires targeted skills development programs for specific subsectors.

The energy landscape is another key driver of change. The limited and unreliable energy supply, coupled with the increasing demand for renewable energy sources, presents both challenges and opportunities. Expertise in renewable energy technologies for mine operations and maintenance of renewable energy infrastructure will be crucial. Additionally, attracting young people back to rural mining communities through skills development programmes and entrepreneurship initiatives can address the issue of youth migration and the high number of unemployed youth (NEETs).

Sectoral Skills Demand and Supply

The SSP analyses hard-to-fill vacancies, highlighting roles such as Mine Manager, Mechanical Engineer, and Mining Engineer – consistently reported as hard-to-fill over the past five years. Lack of relevant experience, poor remuneration, and inadequate qualifications contribute to these vacancies. The rise of automation necessitates expertise in electromechanical engineering and data analysis. This is reflected in the bursary support provided by employers. The environmental focus within the sector calls for skills in environmental

compliance and sustainability.

SETA Partnerships

The MQA prioritises collaboration to address skills needs. Strategic partnerships exist with government departments, state-owned entities, educational institutions, research entities, and industry associations. Collaborations with universities, TVET colleges, and CETs ensure a strong foundation in core technical skills. Partnerships with research institutions can lead to the development of programmes addressing emerging skills necessary for the sector's growth and sustenance.

In addition to existing partnerships, the MQA seeks to expand collaborations with institutions such as the Council for Geoscience and the IDC to unlock expertise in geospatial intelligence and business development support for small-scale mining. International partnerships can also further enrich the skills development strategy by introducing best practices and new skill areas relevant to the future of the sector.

Monitoring and Evaluation

The SETA's sector skills planning reflections revealed a significant increase in learner participation in MQA programmes since 2018/19, demonstrating a rising demand for skills within the MMS. Programmes such as Learnerships, Workplace Experience, and Mine Community Training have shown consistent growth.

The MQA utilises a multi-pronged approach for monitoring and evaluation (M&E) which includes on-site visits, desktop verification, tracer studies, and annual reports. Opportunities for improvement in M&E include standardising data collection methods and expanding the use of tracer studies. This will allow for better trend analysis, long-term impact assessment, and data-driven decision making for future skills development strategies.

Strategic Skills Priority Actions

Building on the findings presented in this Sector Skills Plan, the subsequent skill areas will be prioritised for the current planning cycle:

- ✓ Strengthen the strategic partnership with the DMPR to enhance collaboration on the compliance of the submission of WSP-ATRs, integrate IDPs and Social Labour Plans into the DDM, implement skills development programmes, launch targeted programmes to improve Certificates of Competency (COC) pass rates, and drive transformation in the sector
- ✓ Priority Action 2: Leverage and enhance existing partnerships to deliver skills development through the implementation of SIHIPs, directly contributing to MTDP priorities of employment growth (Outcome 2), responsive skills systems (Outcome 5), and improved public sector governance (Outcome 7)
- ✓ Priority Action 3: Leverage the Special Projects framework to reconfigure the support of SMMEs including the ASM to go beyond the surface level skills development initiatives to include facilitating access to funding from development finance institutions such as DBSA and IDT, infrastructure support and meaningful mentoring
- ✓ Priority Action 4: Continue supporting interventions to improve mine health and safety through targeted skills development and increasing the number of safety officers in the MMS. This includes forging partnerships with mines such as Sibanye to share insights on how to address occupational health and safety (OHS)
- ✓ Priority Action 5: Heighten collaboration with mine training centres and service providers to gain an informed understanding of their skills needs and develop fit-for-purpose solutions that align precisely with emerging technological requirements in the MMS
- ✓ Priority Action 6: Implement skills development support for ex-mine workers as well targeted interventions for the NEET population, ensuring their participation in mainstream economic activities and addressing both skills and employability needs
- ✓ Priority Action 7: Conduct a study aimed at evaluating the MQA's programme performance against three

key criteria: objective attainment (effectiveness), resource optimisation (efficiency), and impact generation (efficacy), ensuring evidence-based continuous improvement

- ✓ Develop a formal Research Recommendations Implementation Framework to synthesize research recommendations into an actionable plan, with a monitoring system to track implementation and maximize the impact of research on sector planning

Overall, this Sector Skills Plan provides a comprehensive analysis of the MMS landscape. By understanding the challenges and opportunities, skills gaps, and the changing needs of the sector, the MQA can develop targeted interventions and partnerships to ensure a skilled

RESEARCH PROCESS AND METHODS

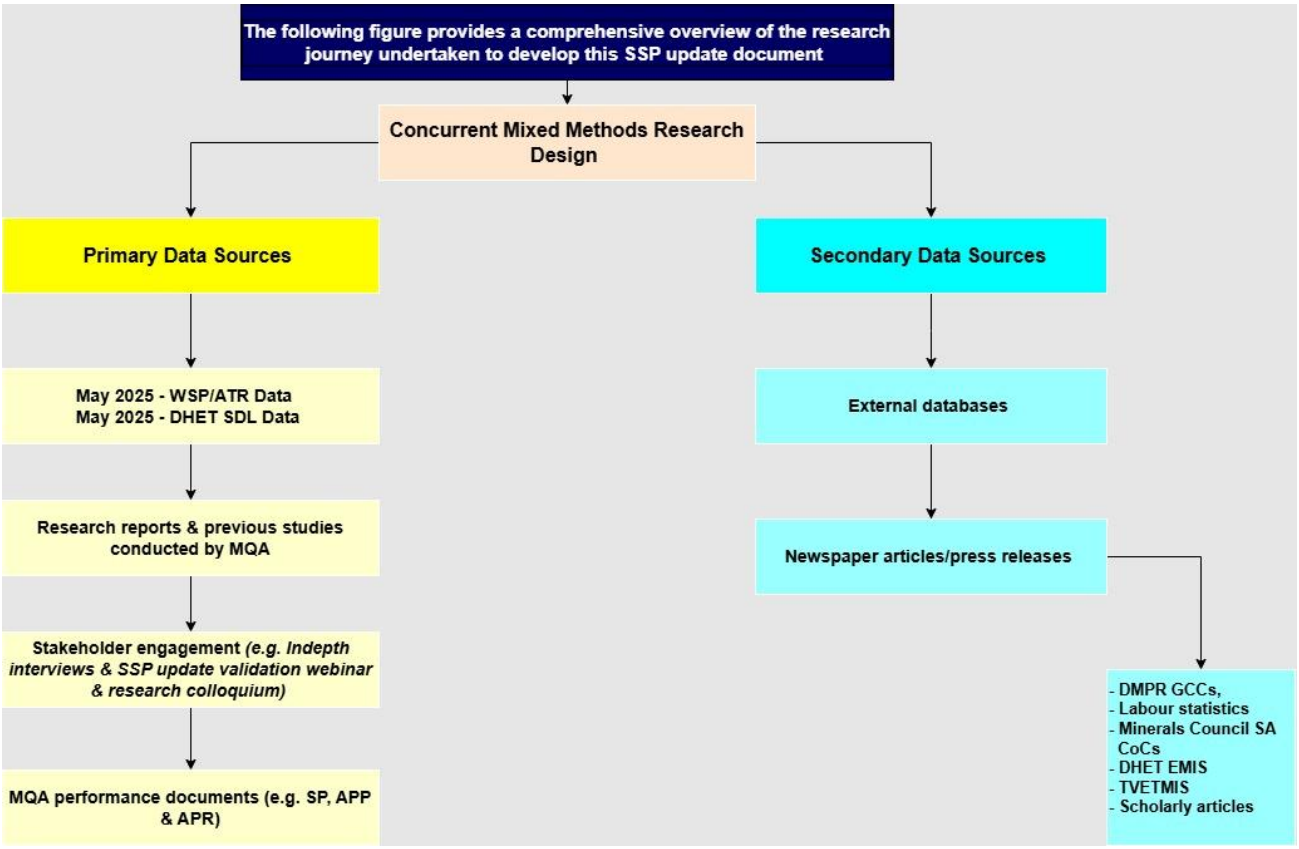
Sector Education and Training Authorities (SETAs) play a pivotal role in ensuring a skilled workforce aligned with national priorities. They achieve this by facilitating the development and delivery of sector-specific skills interventions, directly contributing to the outcomes of the 2024 -2029 Medium-Term Development Plan and ongoing sectoral transformations. Aligned with the five-year planning cycle, each SETA develops a Sector Skills Plan (SSP) to guide skills development within their sectors. This plan is subsequently reviewed and updated annually to ensure its ongoing effectiveness.

This report details the Mining Qualifications Authority's (MQA) 2026-2027 Sector Skills Plan (SSP) Update which outlines the skills development landscape specific to the MMS. While the Plan is forward-looking, it is essential to reflect upon the successes, challenges, and lessons learned during the 2025-2026 planning period to inform and refine future strategies. A reflection of the past year is important to enable the identification and amplification of effective skills development initiatives, addressing areas where objectives were not fully met, and anticipating future needs by analysing shifts in workforce demands, technological advancements, and economic trends. This proactive and reflective approach will ensure that the 2026-2027 SSP update is responsive to the immediate requirements of the sector while also anticipating the challenges and opportunities that lie ahead.

In light of the above, this SSP takes into account the MMS's scope of coverage, key role players, employer profile, and labour market composition. The SSP further identifies critical skills issues, occupational shortages, and existing skills gaps. Importantly, the Plan details existing and planned partnerships, the SETA's monitoring and evaluation function, and finally, presents the strategic skills priority actions to address the evolving skills development needs of the MMS.

This section delves into the research process and methodologies that informed the development of this specific SSP, adhering to the Updated 2025 DHET SSP framework.

Research Process and Method



Source: MQA, 2025

The figure above illustrates the research process and methods employed to develop this SSP. The approach utilised a concurrent mixed methods design, leveraging existing knowledge (secondary data) alongside the collection of primary data. Secondar datasets from institutions such as the Department of Mineral and Petroleum Resources (DMPR), Department of Higher Education and Training (DHET), Minerals Council South Africa, Statistics South Africa (Stats SA), alongside e-publications, relevant newspaper articles, and press releases were used to respond to various chapters of the Plan.

Primary data further enriched the research by incorporating Workplace Skills Plans-Annual Training Reports (WSP-ATR), DHET's Skills Development Levy (SDL) file, the MQA's Annual Performance Reports (APR), Strategic Planning reports, and valuable insights gleaned from past studies conducted by the MQA.

To gain a comprehensive understanding of the sector's economic landscape, future prospects, and the factors influencing its development, a survey, alongside in-depth interviews with 18 stakeholders were conducted from February to April 2025. The stakeholders included, among others, academics and representatives of the mining employers. The MQA also conducted a validation session during its Annual Research Colloquium on 1 July 2025 to broaden perspectives and insights of the SSP. Additionally, SSP update validation seminars were held with internal staff and management, as well as with stakeholders from the MMS. Research partners also contributed meaningfully by offering important insights and information. These sessions assisted MQA to verify the 2025 hard-to-fill vacancies, skills gaps, and provided insights on the skills priority actions in the sector. For a complete record of MQA studies incorporated within this SSP, please refer to the table below.

Project name	Research purpose	Research design	Target population & sample Size			Data collection instruments	Data sources	Study timeframe	Chapter application
1. A study to assess the factors influencing WSP-ATR submissions in the MMS in South Africa	To evaluate the trends in WSP-ATR submissions, factors influencing their submissions and propose ways for increasing submissions rates	Mixed methods research design	Target population	Sample size		▪ WSP & ATR source data template ▪ Questionnaire ▪ Interview schedule guide	WSP-ATR data	September 2024-March 2025	**Chapter 1 & 3**
				Quantitative	n=273				
				Qualitative	n=13				
2. Exploring the state and nature of green hydrogen technologies (GHT) and implications for skills development in the MMS in South Africa	To investigate the current state and nature of green hydrogen technologies in the MMS, identify the challenges and opportunities associated with their implementation, and examine the implications for skills	Mixed methods research design	Target population	Sample size		▪ Survey: Questionnaire ▪ Interview schedule guide	Archival data source, Literature review Notes from forums and other relevant events	September 2024-March 2025	**Chapter 1, 2, 3 & 4**
				Quantitative	46				

Project name	Research purpose	Research design	Target population & sample Size			Data collection instruments	Data sources	Study timeframe	Chapter application
	development			Qualitative	47				
3. The current state of artisan supply in the South African MMS	To identify existing skills and training gaps while proposing solutions for improving skills development and enhancing skills within the MMS.	Mixed methods research design	Target population	Sample size		▪ Survey: Questionnaire ▪ Interview schedule guide	Literature reviews	September 2024-March 2025	**Chapter 3, 4 & 6**
			Artisans: 45000 Employers: 2352	Quantitative	Artisans: 297 Employers: 177				
				Qualitative	16				
4. Exploring beneficiation skills that can be prioritised in the MMS	To determine the critical skills that the MMS should prioritise for the successful implementation of mineral beneficiation in South Africa	Desktop research	Target population	Sample size		N/A	Peer reviewed papers, reports, online material, as well as grey literature	September 2024-March 2025	**Chapter 3 &4**
			N/A	N/A					

Project name	Research purpose	Research design	Target population & sample Size			Data collection instruments	Data sources	Study timeframe	Chapter application
5. MQA four-year WSP-ATR submissions trends analysis report (2021-2024)	To analyse the WSP-ATR data submitted by sector employers for the financial years 2021-2024 to establish trends in terms of skills gaps, occupations in demand and hard-to-fill vacancies.	Quantitative	Target population	Sample size		WSP/ATR Templates	WSP/ATR data	September 2024 - April 2025	**Chapter 2 & 3**
			N/A	N/A					
6. Impact assessment and evaluation of the effectiveness and relevance of Presidential Youth Employment Initiative (PYEI) for the past 3 years (2021-2024)	To provide MQA with a comprehensive report on the issues that affect and contribute towards the advancement of the unemployed youth in South Africa. Also, highlighting the issues that might prohibit the prospects of the	Mixed methods research design	Target population	Sample size		▪ Survey: Questionnaire ▪ Interview schedule guide	Database of learners, Funding policy and any other relevant policies	December 2024 – March 2025	**Chapter 1**
			1348	Quantitative	n=250				

Project name	Research purpose	Research design	Target population & sample Size			Data collection instruments	Data sources	Study timeframe	Chapter application
	employment of youth.			Qualitative	n=24				
7. MQA National Certificate (Vocational)(NCV) NQF level 4 Graduates Research Study	To assess and evaluate the impact made on the beneficiaries by tracing and tracking the whereabouts of the NCV Level 4 Graduate beneficiaries	Mixed methods research design	Target population	Sample size		Questionnaire and interview schedule guide	Database of learners, Funding policy and any other relevant policies	December 2024 – March 2025	**Chapter 1, 2 & 3**
				Quantitative	n=831				
				Qualitative	n=21				
8. Impact assessment and evaluation of the effectiveness and relevance of CET AET program for the past three years (2021/22, 2022/23 and 2023/24)	To evaluate the impact, effectiveness, challenges, and identify areas for improvement in CET AET program based on lessons during its execution between 2021 and 2024	Mixed methods research design	Target population	Sample size		▪ Survey: Questionnaire ▪ interview schedule guide	Database of learners, Funding policy and any other relevant policies	December 2024 – March 2025	**Chapter 1, 2 & 3**
				Quantitative	n=270				
				Qualitative	n=26				

Project name	Research purpose	Research design	Target population & sample Size			Data collection instruments	Data sources	Study timeframe	Chapter application
9. Examining the skills levels and knowledge of the existing OHS representative in the MMS	To evaluate the current skill levels and knowledge deficiencies of OHS representatives in the MMS and identify essential areas for enhancement in training and development programmes.	Mixed methods research design	Target population	Sample size		▪ Survey: Questionnaire ▪ interview schedule guide	Database of OHS representatives in the MMS	September 2024-March 2025	**Chapter 2 & 3**
				Quantitative	n=102				
				Qualitative	n=14				
10. Challenges and opportunities for small-scale mining in the South African economy	Examined the challenges and opportunities present within South Africa's artisanal and small-scale mining (ASM) sector, underscoring its significance as a	Mixed methods research design	Target population	Sample size		▪ Survey: Questionnaire ▪ interview schedule guide	Database of small-scale mining companies	September 2024-March 2025	**Chapter 3 &6**
				Quantitative	n=102				

Project name	Research purpose	Research design	Target population & sample Size			Data collection instruments	Data sources	Study timeframe	Chapter application
	vital driver of rural development and employment.			Qualitative	n=14				
11. A study to identify and analyse the specific MMS-related skills development needs in the North-West province	Identify and map the key skills needs and shortages related to the MMS sector within the North-West province	Mixed methods research design	Target population	Sample size		▪ Survey: Questionnaire ▪ Focus group discussion guide	Employer and Training provider databases, relevant internet, books, e-publications and journals	September 2024-March 2025	**Chapter 3**
				Quantitative	n=320				
				Qualitative	n= 9				
12. The quest towards attaining JET:	To evaluate the implementation of ESG	Mixed methods	Target population	Sample size		▪ Survey: Questionnaire ▪ Focus group	Employer and Training provider		**Chapter 2 & 3**

Project name	Research purpose	Research design	Target population & sample Size			Data collection instruments	Data sources	Study timeframe	Chapter application
Assessing the Implementation of ESG-Related skills to determine the requirements for skilling and Upskilling of the MMS Workforce	frameworks and to identify the necessary requirements for both skill development and enhancement of the workforce within the MMS in pursuit of achieving a just energy transition.	research design		Quantitative	n= 102	discussion guide	databases, relevant internet, books, e-publications and journals	September 2024-March 2025	
				Qualitative	n= 14				

The SSP encompasses dedicated chapters and responds to all nine subsectors of the MMS. The MQA's leadership, including the Management Team and Executives played a pivotal role throughout the entire process of the development of this SSP. Their input, guidance, and rigorous oversight ensured the development of a robust and comprehensive SSP. The following section presents Chapter 1, which delves into the sector's profile. It outlines the sector's scope of coverage, key role players, employer profile and labour market analysis.

CHAPTER 1: SECTOR PROFILE

1.1. Introduction

This chapter provides an overview of the MMS, detailing its scope, key stakeholders, and economic performance, as well as an analysis of employer profiles and the labour market. The analysis utilises a variety of rich data sources, including official statistics from Stats SA, datasets from the May 2025 WSP/ATR, and insights from the Minerals Council South Africa's Facts and Figures report. Additionally, primary data from the May 2025 DHET's SDL file is incorporated. The analysis is further enhanced by insights gained from the SSP update validation seminars and the MQA Research Colloquium. Finally, previous MQA studies and scholarly articles also inform the discussion.

1.2. Scope of Coverage

The MMS is segmented into nine subsectors, each with its own Standard Industrial Classification Code (SIC). The SIC is a system used to classify industries by a numerical code. It was developed to facilitate the organisation and analysis of economic data related to different sectors of the economy. Each industry is assigned a unique numerical code, allowing for straightforward categorisation and comparison across various datasets. Table 1.1 below provides a detailed breakdown of the associated SIC codes for reference.

Table 1. 1: MMS Scope of Coverage

Subsector	SIC code
Coal Mining	21000, 22100
Gold Mining	23000, 23001, 23002, 23003
Platinum Group Metals (PGMs)	24240
Diamond Mining	25200, 25201, 25202
Other Mining (includes the mining of iron ore, chrome, manganese, copper, phosphates, and salt)	24000, 24100, 24200, 25000, 25102, 25103,25201,25202, 25320, 25391
Cement, Lime, Aggregates and Sand (CLAS)	34240, 25101
Services Incidental to Mining	29000, 92004, 87000, 29000, 85291
Diamond Processing	39212, 39219
Jewellery Manufacturing	39210, 39211, 37601

Source: Government Gazette, no: 33756 11 (2012)

The scope of coverage includes the MMS value chain, as represented in Figure 1.1. The value chain is depicted starting from the exploration of primary mineral deposits, progressing through the extraction, processing and value addition processes, and incorporating the supportive activities at each stage. Understanding the scope of coverage, including all nine subsectors of the MMS, is important for skills planning because it ensures a comprehensive and inclusive approach that reflects the full diversity and complexity of the industry. Each subsector, such as coal mining and PGMs has unique operational requirements, necessitating different processes and technologies, regulatory environments, and occupational profiles. By considering all nine subsectors, skills planning can accurately identify sector-specific needs, avoid underrepresentation of smaller or emerging minerals, and ensure balanced investment in training across the sector. This broad scope also supports more effective policy implementation, promotes transformation and equitable development, and helps to future-proof the workforce by anticipating skills needed for innovation, sustainability, and evolving global market demands across all areas of the MMS.

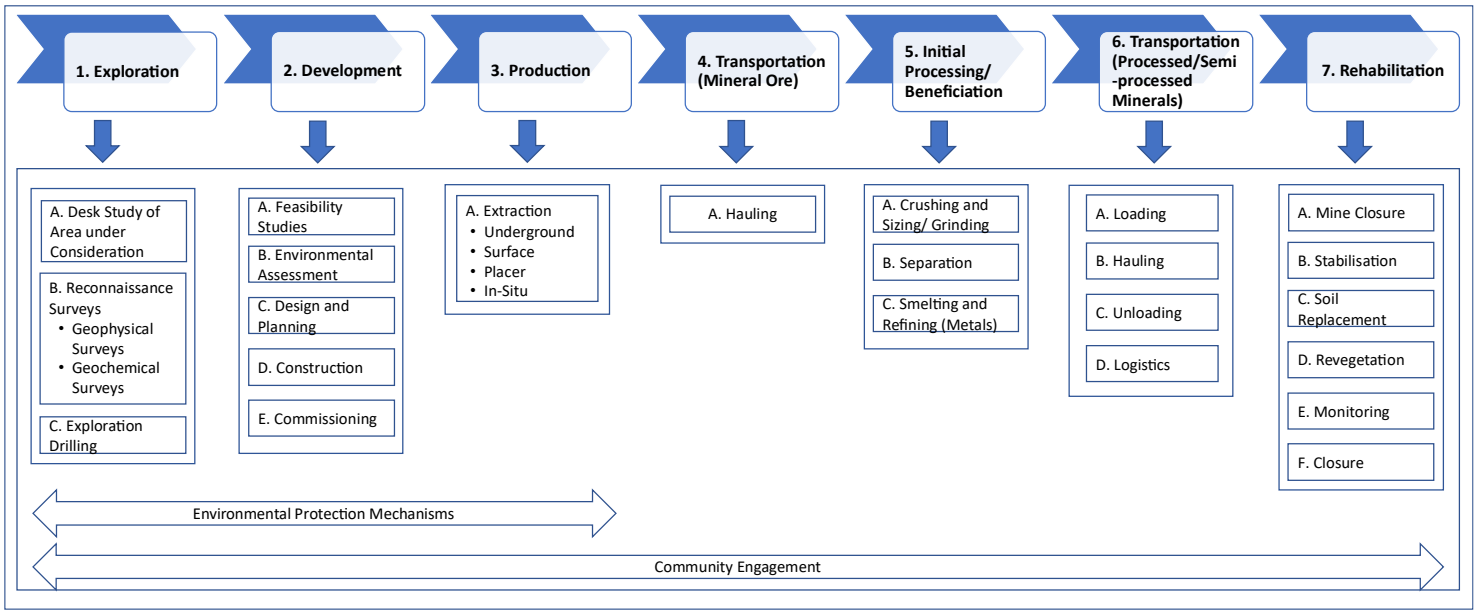


Figure 1. 1: The MMS Value Chain

Source: MQA, The Impact of 4IR Research Study (2024)

The next section presents the key role players in the MMS, delving into their role in relation to skills development and relevance to the National Skills Development Plan (NSDP) outcomes.

1.3. Key Role Players

Key role players in the MMS are institutions or entities that exert significant influence on the sector's operations, development, and regulatory framework. These stakeholders play a pivotal role in decision-making, resource allocation, policy execution, and skills development. Mapping these role players is a critical step in enhancing the skills development ecosystem, as it identifies key participants such as mining companies, government departments, state-owned entities, training providers, labour unions, and local communities. This process delineates their roles and contributions, fostering improved coordination and collaboration to align training initiatives with labour market requirements and local employment needs.

1.3.1. National Government Departments

Table 1.2. below provides an overview of the national government departments that are interconnected within the MMS, emphasising their pivotal role in promoting skills development in alignment with the objectives of the NSDP. This section examines the distinct functions of each key stakeholder within the MMS and demonstrates their contributions toward achieving the NSDP outcomes.

Table 1. 2: National Government Department Key Role Players

Department	Role in Skills Development	Relevant NSDP Outcome(s)
DMPR	* Drives policy by focusing on skills & transformation. * Supports the acquisition of mining rights and competency for operations in the MMS. * Shares data/statistics (public labour statistics, GCC reports). * Supports the MQA in encouraging companies to submit WSP & ATRs.	* DMPR's relevance to skills development lies in its role in policy formulation, regulatory oversight, and collaboration with SETAs and educational institutions to ensure a continual supply of adequately skilled personnel for the mining and petroleum sectors, aligned with the country's socio-economic transformation and development goal.

Department	Role in Skills Development	Relevant NSDP Outcome(s)
DHET	* Implements legislation & develops strategies (aligned with NSDP) for post-school education. * Supports the MQA (research, frameworks, data) for skills planning. * Develops policies for a quality and accessible post-school education system. * Encourages and supports worker-initiated training. * Supports the growth of public TVET and CET programmes.	*Improves the skills levels of the South African workforce by identifying occupations in high demand. *Increase production of occupations in high demand by developing appropriate curriculum or learning interventions. *Link education and the workplace.
DBE	* Oversees the quality of basic education provision (aligned with national policy). * Supports career development initiatives.	*Increase the level of skills in the South African workforce.

1.3.2. State-owned Entities, Research, Quality Councils and Professional Bodies

Table 1.3. provides details on state-owned entities, their role, as well as their relevance in addressing skills development in the MMS envisaged in the NSDP.

Table 1. 3: State-owned Entities, Research, Quality Councils and Professional Bodies Key Role Players

Entity	Role in Skills Development	Relevant NSDP Outcome(s)
National Skills Fund	*Funds skills development initiatives aligned with the National Skills Development Plan, mandated by the Skills Development Act, or initiatives recognised as efforts by the Minister to uphold standards of excellence in skill development.	*Increase the level of skills in the South African workforce. *Identify and increase production of occupations in high demand. *Skills development support for entrepreneurship and cooperative development. *Supports career development initiatives.
Mine Health and Safety Council (MHSC)	*Promotes a culture of health and safety through awareness, research, and training to supports initiatives that reduce injuries and fatalities in the MMS.	*Improves the level of skills concerning health and safety training. *Supports skills development programmes aimed at occupational health and safety.
Minerals Council South Africa	* Plays a proactive role in advocating for the advancement of the MM by supporting various initiatives related to communities, education, health, labour, policy and regulations, safety, and women in mining. *Facilitate the development of a highly skilled and trainable MMS workforce, ready for deployment and career advancement.	*Increase the level of skills in the South African workforce. *Identify and increase production of occupations in high demand. *Skills development support for entrepreneurship and cooperative development. *Supports career development initiatives.
Council for Geoscience	*Through its mine project, identifies and promotes skills development related to remediation or rehabilitation of mines. *Supports public colleges for higher learning and recommends relevant learning programmes.	Identify and address the production of skills in high demand by supporting and contributing towards the growth of public colleges as a key provider of higher learning and recommend learning programmes within its scope of work.
Quality Council for Trades and Occupations (QCTO)	* Oversees development, implementation, and quality assurance of occupational qualifications in TVET. *Sets quality standards and guidelines for training providers. *Oversees accreditation of training providers, assessment centres, and moderators. *Develops occupation-specific qualifications to address skills gaps.	*Improves the skill levels of the workforce by identifying high-demand occupations. *Increase production of high-demand occupations by developing curriculum. * *Link education and the workplace by developing occupational qualifications which are directed at providing

Entity	Role in Skills Development	Relevant NSDP Outcome(s)
	*Works with industry to identify occupations in high demand.	occupationally specific skills for tackling skills gaps.
Council for Scientific and Industrial Research (CSIR)	*Applies R&D in 4IR to enhance the technological capabilities of the MMS. *Creates a demand for upskilling the MMS workforce in new technologies, potentially leading to collaboration with training providers. * Conducts targeted research that addresses national imperatives and leverages its expertise in science, engineering, and technology to support both public and private sectors.	Improves the technological base of the sector through the application of 4IR.
Mandela Mining Precinct (MMP)	*Improves training resources. Conducts research to develop improved training resources and inform training programme development. *Focuses on pre-competitive research addressing industry-wide needs, ultimately leading to a more skilled workforce. *Facilitates knowledge sharing within the industry, keeping training providers and employers updated on advancements and required skills.	* Increase the level of skills in the South African workforce. * Identify and increase production of occupations in high demand. * Skills development support for entrepreneurship and cooperative development. * Skills development support for entrepreneurship and cooperative development
Mintek	*Provides technical expertise, training, and equips employees with knowledge of emerging technologies and industry best practices. *Provides technical support, expertise, and training to enhance competitiveness and growth of artisanal and small-scale mining. *Develops and provides cost-effective mineral recovery and beneficiation technologies. * Assists the MMS to operate more effectively by developing and making available, the most appropriate and cost-effective mineral recovery and mineral beneficiation technologies.	*Improves the level of skills in the South African mining workforce. *Increase access to occupationally directed programmes. *Skills development support for entrepreneurship and cooperative development. *Identify and increase production of occupations in high demand.
MQA	*Provides funding and programmes (learnerships, internships, bursaries, artisanship, career guidance) for skills transformation. *Facilitates access to industry experience through workplace programmes. *Conducts research to identify occupations in high demand within the MMS and to also inform labour market intelligence for the MMS. *Encourages and supports worker-initiated training programmes. *Bridges skills gaps through artisanship, internships, and learnerships.	*Increase the level of skills in the South African workforce *Identify and increase production of occupations in high demand *Skills development support for entrepreneurship and cooperative development *Improve career development initiatives *Link education and the workplace
20 South African SETAs	* The 20 South Africa SETAs, including the MQA share a common mandate of administering skills development in country. However, there are complimentary assignments that can be undertaken, e.g. promoting and facilitating apprenticeship and learnership programmes specifically designed for artisan development. This mandate dovetails with the mandate of the MQA to jointly implement SIHIP (SETA Integrated high impact programmes).	*Increase the level of skills in the South African workforce *Identify and increase production of occupations in high demand *Skills development support for entrepreneurship and cooperative development *Improve career development initiatives *Link education and the workplace.
Association of Mine Managers South Africa (AMMSA)	*Facilitates discussions and knowledge sharing among industry professionals on skills development. *Connects mining companies, training providers, and government to work together on skills development initiatives.	*Improve career development initiatives *Skills development support for entrepreneurship and cooperative development

Entity	Role in Skills Development	Relevant NSDP Outcome(s)
	* Facilitating mentorship programmes linking experienced professionals with new entrants, fostering knowledge transfer and skill development.	*Increase the level of skills in the South African workforce
Mining Equipment Manufacturers of South Africa (MEMSA)	*Advocates for local technology and innovation, facilitating entry for original equipment manufacturers. * Facilitates collaboration between mining companies, research institutions, and government to identify skills gaps and develop training programmes. * Highlights changing skills needs in the MMS due to technological advancements. * Advocates for high standards in mining equipment, potentially requiring a more skilled workforce for operation and maintenance.	*Increase the level of skills in the South African workforce *Identify and increase production of occupations in high demand *Improve career development initiatives
Statistics South Africa (Stats SA)	*Publishes reports and datasets that provide insights into the labour market, including skills shortages and the demand for specific occupations within the MMS. * Informs policy decisions by government bodies related to skills development initiatives. * Allows comparisons between sectors and regions to identify critical skill shortages within the MMS.	*Improved planning and implementation of skills development initiatives
Industrial Development Corporation (IDC)	*Offers financing products tailored to the MMS, including financing ASM. * Allocate funds to support skills development programmes, targeting priority areas such as artisan skills. * Collaborate with training providers to co-fund or sponsor programmes aligned with industry needs. * Encourage small and medium-sized mining companies to invest in workforce training through their support for enterprise growth. * Contribute to skills development for HDSAs by supporting their entry and advancement in the MMS through investment in relevant training programmes. * Increase the level of skills in the South African workforce	* Improve career development initiatives. * Improve career development initiatives. * Skills development support for entrepreneurship and cooperative development
Southern African Institute of Mining and Metallurgy (SAIMM)	* Offers programmes and courses to keep mining professionals updated on advancements and best practices * Acts as a voluntary association for mining professionals, registering engineers and technicians based on their qualifications and experience. This registration process promotes professionalism and helps maintain high standards within the MMS workforce. * Plays a role in setting and promoting technical standards, ensuring training programmes align with industry needs.	* Increase the level of skills in the South African workforce. * Improve career development initiatives. *Promote professionalism and ethics within the workforce. * Improve career development initiatives.

1.3.3. Educational institutions, Skills Development Providers, Mine Communities & Organised Labour

In addition to the national government departments, state-owned entities and industry key role players, there are additional key role players who contribute to skills development in the MMS. Their role in relation to skills development and relevance to the NSDP outcomes are discussed in Table 1.4. below.

Table 1. 4: Educational Institutions, Skills Development Providers and Mine Communities Role Players

Role Player	Contribution to Skills Development	Relevant NSDP Outcome(s)
Schools (primary and secondary)	* Provides a foundation in core subjects such as literacy, numeracy, and critical thinking is crucial for future learning and grasping technical concepts relevant to the MMS. * Encourages an interest and proficiency in Science, Technology, Engineering, and Math (STEM) subjects which are particularly important for the MMS.	*Improves the level of skills in the South African workforce. * Improve access to occupationally directed programmes.

Role Player	Contribution to Skills Development	Relevant NSDP Outcome(s)
	* Schools also play a role in developing general transferable skills valuable in any career path, including the MMS. These skills may include communication, problem-solving, teamwork, and digital literacy.	
PSET Institutions (Universities, TVETs, and CETs)	* Universities offer qualifications in various disciplines relevant to the MMS, such as mining engineering, geology, metallurgy, and environmental science. * Universities conduct research on topics critical to the advancement of the MMS, such as new mining technologies, sustainable practices, and safety improvements. This research and development contribute to innovation within the sector and can inform the curriculum of future skills development programmes. * TVET colleges offer vocational training programmes for the MMS. These programmes provide students with the practical skills and job-ready qualifications needed for various technical occupations. *T VET colleges often collaborate with mining companies to offer practical training and workplace experience programmes. * CETs provide customised training programmes tailored to the specific needs of a particular mining company and community. * CETs offer short-term, specialized courses designed to upskill or reskill existing employees within the MMS.	* Increase quality of education and training *Increase the level of skills in the South African workforce. * Improve career development initiatives. * Attract, develop and retain scarce and critical skills. * Improve access to occupationally directed programmes.
Accredited private training providers	* Delivery of training programmes to address relevant skills gaps and equip graduates with industry-demanded skills. * Focus on specific skills and short programmes that address immediate industry needs, * Provision of training that adheres to quality standards, with qualified instructors, up-to-date curriculum, and proper assessments, resulting in graduates with a higher level of preparedness for MMS careers. * Offers potentially more cost-efficient solutions and delivery training on-site at mining companies for minimal disruption.	* Improve access to occupationally directed programmes. * Increase quality of education and training. * Increase the level of skills in the South African workforce. * Identify and increase production of occupations in high demand
Civil Society (CSOs) (NGOs, Lobby and Advocacy Groups)	* Mobilizes communities for support of the MMS, fostering stability and positive relationships. * Can advocate for increased government and industry investment in skills development programmes relevant to the MMS. * Some CSOs might directly facilitate or support learnerships and apprenticeship programmes within the MMS. * Hold mining companies accountable for ensuring the effectiveness and accessibility of training programmes.	*Links education and the workplace. *Improves the level of skills in the South African workforce. *Increase access to occupationally directed programmes. *Skills development support for entrepreneurship and cooperative development. *Identify and increase production of occupations in high demand.
Mine communities	* House a significant population that can potentially contribute to the future workforce of the MMS. * Some mine communities might collaborate with NGOs, government agencies, or mining companies to establish local skills development initiatives. These initiatives can offer basic skills training, career guidance, or mentorship programmes to equip community members with the foundational skills needed to pursue careers within the MMS. * May advocate for increased access to skills development programmes relevant to the specific needs of their local area.	* Increase the level of skills in the South African workforce. * Improved planning and implementation of skills development initiatives. * Links education and the workplace. Increase access to occupationally directed programmes.
Organised Labour (NUM, NUMSA, AMCU, Solidarity & UASA)	*Promotes the interests of employees in the MMS *Supports the MQA in encouraging companies to submit WSP & ATRs.	* Increase the level of skills in the South African workforce. * Improved planning and implementation of skills development initiatives.

1.3.4. Cross-Sectoral Fora on Just Energy Transition

The Just Energy Transition (JET) significantly impacts skills development by requiring a broad, integrated, and forward-looking approach to education and training that aligns with emerging green industries and social equity goals. Various key players in the MMS are driving discussions on the development of JET. These are discussed in Table 1.5 below.

Table 1. 5: Cross Sectoral Fora on the Just Energy Transition

Role Player	Contribution to skills Development	Relevant NSDP outcomes
Presidential Climate Commission (PCC)	*Advances skills development to support South Africa's transition to a sustainable, low-carbon economy. *Ensures that the workforce is equipped for emerging industries, particularly those central to the Just Transition, such as renewable energy, sustainable agriculture, and the circular economy	* Driving skills development aligned with South Africa's economic growth, employment creation, and social development goals. * Build an educated, skilled, and capable workforce by improving access to priority skills, raising employment through faster economic growth, and enhancing the quality of education and training
Inter-Departmental Forum on Critical Minerals Strategy	* Contributes to skills development primarily through Pillar III of South Africa's Critical Minerals and Metals Strategy, which focuses on research, development, and building a skilled workforce. * Emphasizes coordinated efforts to develop human capital capable of supporting exploration, beneficiation, and value chain activities in the critical minerals sector	* Leverage natural resources for economic growth, industrial development, job creation, and economic transformation. * Develop an educated, skilled, and capable workforce to support economic growth, employment, and social development.
Social Dialogue on Jet	* Coordinates multi-stakeholder efforts for demand-driven, inclusive skilling. * Building localized skills ecosystems focused on marginalized communities. *Prioritizing equitable access to green economy jobs for vulnerable groups. * Aligning skills training with evolving market and technological needs. * Enabling reskilling and upskilling for workers affected by the transition. * Encouraging continuous collaboration and innovation in skills formation.	* Increase the level of skills in the South African workforce.

The next section discusses the MMS' employer profile, followed by the labour market analysis.

1.4. Employer Profile

This section leverages data from the DHET skills development levy file to provide an analysis of employers in the MMS. Key insights are provided regarding the geographical distribution of employers, their subsector and company size. Figure 1.2. below illustrates the trends pertaining to the number of registered levy-paying companies operating within the MMS over the past five years (2021-2025).

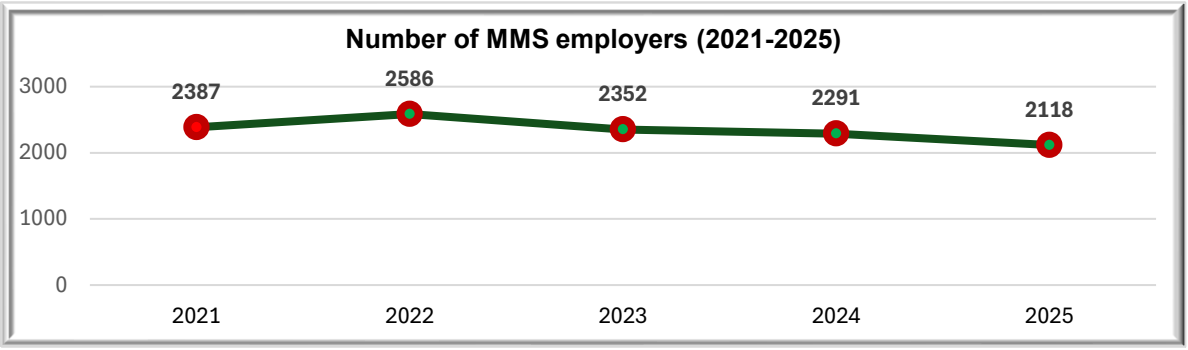


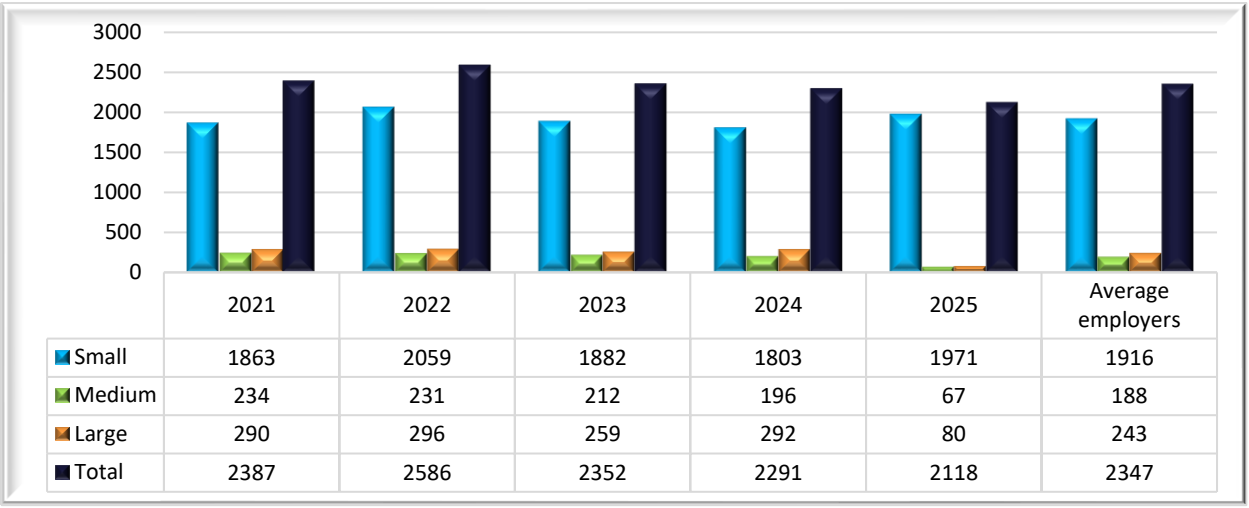
Figure 1. 2: Number of MMS Employees (2021-2025)

Source: DHET Skills Development Levy Registration File (May 2025)

Figure 1.2. illustrates a fluctuating trend in the number of registered levy-paying companies within the MMS between 2021 and 2025. The number of employers began at 2,387 in 2021, then experienced a notable increase to a peak of 2,586 in 2022, suggesting a period of expansion within the sector. This growth was followed by a substantial decline to 2,352 in 2023 and a further dropped to 2,291 in 2024, indicating a possible contraction due to economic pressures or industry-specific challenges. The number of employers in the MMS declined sharply by 2025, reaching the lowest point of 2,118.

1.4.1. Employer by Company Size

Figure 1.3. below displays the proportion of employers in the MMS, categorised by company size (small, medium, and large), spanning from 2021 to 2025. Small companies are defined as those with less than 50 employees, medium companies have 50-149 employees, and large companies have 150 or more employees.



	2021	2022	2023	2024	2025	Average employers
Small	1863	2059	1882	1803	1971	1916
Medium	234	231	212	196	67	188
Large	290	296	259	292	80	243
Total	2387	2586	2352	2291	2118	2347

Figure 1. 3: Employers by Company Size (2021-2025)

Source: DHET Skills Development Levy Registration File (May 2025)

Figure 1.3. illustrates the trends in employer numbers currently paying levies categorized by company size from 2021 to 2025. Small companies consistently constituted the largest proportion, with their numbers increasing from 1,863 in 2021 to 2,118 in 2025, averaging 1,916 employers over the five-year period. Medium-sized companies experienced a consistent decline, with their numbers decreasing from 234 in 2021 to 67 in 2025. A significant number of medium-sized companies that existed in 2024 are missing in 2025. Only two companies were transferred from MQA to other SETAs. Large companies exhibited variability, with their numbers peaking at 296 in 2022 and declining to 80 by 2025. The decline of medium and large employers in the MMS are driven by mergers and acquisitions, as companies seek efficiency, resilience, or diversification (Rossouw & Khutlang, 2023). While these transactions create opportunities, they also lead to job losses, requiring reskilling and

upskilling of affected workers to enhance their employability (Masuku, 2023). Against profile of the MMS, it will be important for the MQA to focus on supporting small mining companies while addressing the needs of medium and large firms to ensure comprehensive skills development.

1.4.2. Employer by geographic location

Table 1.6 below illustrates the geographic distribution of the MMS' employers, focusing on the past five years (2021-2025).

Table 1. 6: Employer by Geographic Location (2021-2025)

Province	2021	2022	2023	2024	2025	Average
Gauteng	1078	1093	993	1056	1025	1049
Mpumalanga	327	379	334	346	242	326
North-West	293	328	308	254	250	287
Western Cape	217	229	205	187	235	215
Northern Cape	169	201	176	125	95	153
Limpopo	120	150	136	147	100	131
KwaZulu-Natal	88	100	101	88	87	93
Free State	55	62	56	49	43	53
Eastern Cape	40	44	42	39	41	41
Total	**2387**	**2586**	**2351**	**2291**	**2118**	2347

Source: DHET Skills Development Levy Registration File (May 2025)

Gauteng has consistently been the leading province in terms of MMS employers between 2021 and 2025. However, its figures have been fluctuating between a low of 993 in 2023 and a high of 1,025 in 2025. It is important to note that Gauteng is mainly a business and administrative centre for mining companies rather than a mining production hub. Mpumalanga ranks second, maintaining an average of 326 employers, followed by the North-West in third place with an average of 287. There has been a decrease in the number of employers in most provinces, except for Western, which is known for its absence of heavy mining presence. This is the highest representation they have had over the past five years. In the Eastern Cape province, the number of employers decreased as well.

1.4.3. Employer Distribution by Subsector (2021-2025)

Table 1.7. below illustrates the sub sectoral distribution of the MMS' employers, focusing on the past five years (2021-2025).

Table 1. 7: Employer Distribution by Subsector

Subsector	2021	2022	2023	2024	2025	Average employers
CLAS	129	132	120	109	103	119
Coal Mining	241	259	249	291	222	252
Diamond mining	24	20	35	46	19	29
Diamond Processing	60	43	28	40	40	42
Gold mining	140	85	71	91	110	99
Jewellery Manufacturing	170	175	143	152	154	159
Other mining	1062	1202	936	1028	994	1044
PGM mining	28	21	35	34	23	28,2
Services Incidental to Mining	533	649	734	500	453	574
Total	**2387**	**2586**	**2351**	**2291**	**2118**	**2345**

Source: DHET Skills Development Levy Registration File (May 2025)

The Other mining subsector served as the main employer of the MMS from 2021 to 2025, with an average total of 1,044 employees over the five-year period. While it shows some yearly fluctuations, such as a significant drop in 2023 (936) followed by a rebound in 2024, its dominance consistently remains high, often exceeding 40% of all employers in the sector. The Services Incidental to Mining subsector, is the second largest in terms of employer count, peaked in 2023 with 734 employers. By 2025, the number had declined to 453, averaging 574 employers between 2021 and 2025. Coal mining ranks as the third-largest subsector by the number of employers, with an average of 252 companies. Over time, the number of companies has varied, peaking at 241 in 2021 and dropping to 222 by 2025. Diamond processing subsector remains stagnant with 40 employers in 2024 and 2025. Insufficient investment in diamond mining and decreasing financial investment in South African mining has resulted in restricted exploration for new mines and the expansion of current ones (Creamer. 2024).

1.5. Labour Market Analysis

This section provides the labour market analysis of the MMS, considering the economic performance and employee profile. It provides a sectoral lens on the sector's workforce, examining critical trends in employment patterns, evolving skill demands, and workforce demographics. By gaining insights into these factors, the MMS can develop effective workforce planning strategies. These strategies will focus on attracting and retaining top talent, fostering the development of critical skills, and cultivating a dynamic and adaptable workforce that thrives in a constantly changing economic environment. The analysis commences by examining the economic performance of the MMS, with a focus on production and sales of minerals, the sector's contribution to GDP and economic performance in relation to employment. Subsequent analysis then delves deeper into the sector's employee profile, highlighting their representation by subsector, occupational levels, age, gender, disability, race and highest qualification.

1.5.1. Economic Performance

The economic performance of the MMS plays a crucial role in shaping skills development needs. This section delves into the key economic indicators that impact skills within the sector. It presents the trends in mining production and sales to assess industry activity levels. In addition, the influence of the NEET population on skills development is explored, considering potential recruitment pools and training requirements. The section then examines the sector's contribution to the Gross Domestic Product (GDP) to gauge its economic significance. Finally, employment creation and retrenchment trends are included to understand their effect on the demand for specific skills and potential reskilling needs. This analysis aims to provide valuable insights

for developing targeted skills development strategies that are aligned with the evolving economic landscape of the MMS.

1.5.1.1. Mining Production and Sales

When the demand for minerals rises, existing mining operations are frequently expanded, leading to increased funding for skills development programmes through SETAs and royalties from mining companies. The table 1.8 below depicts total mining production and sales between 2019-2024.

Table 1. 8: MMS production and sales (2019-2024)

Year	2019	2020	2021	2022	2023	2024
Mining Production (per index)	100	89.1	100.9	93.0	93.1	93.5
Mining Sales (R Million)	552 880.90	613 191.60	857 279.90	883 740.8	794 232.5	802 421.4
"Index of the volume of mining production: The index of the volume of mining production, also known as the production index, is a statistical measure of the change in the volume of production. The production index of a mineral group is the ratio between the volume of production of a mineral group in a given period and the volume of production of the same mineral group in the base period. The current base period is 2019. The production in the base period is set at 100."						

Source: Statistics South Africa, 2025

As shown in table 1.8., the volume of mining production in South Africa from 2019 to 2024, measured against a 2019 baseline of 100, has shown fluctuations over the years. While production volume generally declined, 2024 saw a slight increase of 0.4% compared to 2023, a tepid recovery after consecutive contractions in 2022 and 2023. In 2024, manganese and chrome production showed resilience, while iron ore and gold experienced the most acute declines. Despite a slight rebound in production and sales from a low base, the sector is still well below pre-COVID-19 levels (Mitchell, 2025). One employer representative suggested that “a reduction in mining production has the potential to adversely affect sales within the MMS, which may subsequently necessitate mine companies to undertake internal cost-cutting measures, potentially resulting in job losses.” (Mine employer interview: PGMs, 2025). The MQA has a responsibility to support employees in developing cross-sectoral skills, enabling them to adapt to the cyclical nature of the MMS and transition into alternative sectors or entrepreneurial opportunities during economic downturns.

1.5.1.2. Involvement of the Not in Employment, Education or Training (NEET) population

Unemployment remains a critical socio-economic challenge in South Africa, with profound implications for the MMS. A significant concern is the prevalence of individuals classified as NEET, which constrains the sector's capacity to achieve its full potential. Addressing this issue presents an opportunity to bridge skills gaps and harness the untapped potential within the MMS workforce. The NEET population represents a valuable resource that, through the implementation of targeted skills development strategies, can be effectively integrated into the sector to enhance its productivity and sustainability. The following are skills development strategies that can be leveraged to accommodate the NEET cohort into the MMS:

1. **Targeted retraining and upskilling programmes:** Implement skills programmes for the NEET population to equip them with mining-related technical skills, enhancing employability and workforce integration.
2. **Entrepreneurship and business development support:** Empower NEET individuals through entrepreneurial training and SMME support, focusing on marginalised groups to promote economic inclusion.
3. **Transferable skills development:** Fostering transferable skills such as communication, problem-solving, and teamwork to enhance employability across the MMS and beyond, offering broader career opportunities.

1.5.1.3. GDP

As illustrated in figure 1.4. below, South Africa's GDP experienced marginal growth of 0.1% in the first quarter of 2025 compared to the preceding quarter (Statistics South Africa, 2025). The agricultural sector emerged as the primary driver of this growth, expanding by 15.8%, attributed to favourable rainfall that enhanced horticultural production and animal product outputs. Conversely, the MMS contracted by -4.1%, with PGMs being the primary contributor to this decline, alongside reduced production in coal, chromium ore, gold, copper, and nickel. Although iron ore, manganese ore, and diamonds recorded growth, these increases were insufficient to offset the overall decline in sector (Statistics South Africa, 2025).

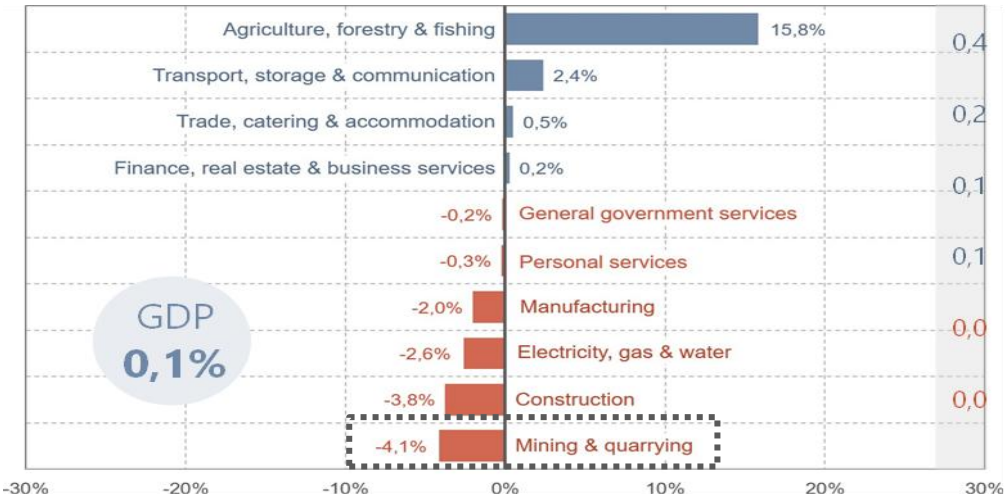


Figure 1. 4: Q1 2025 GDP Contribution

Source: Stats SA Q4 GDP Contribution by Economic Sectors (2025)

1.5.1.4. Employment creation and retrenchments in the MMS

The year 2024 was marked by a significant drop in MMS employment, with a -5 percent year-on-year difference compared to 2023. The 2025 WSP-ATR data also indicate a decline in employment within the MMS. The decline in employment is happening alongside the decline in commodity prices, due to a combination of operational, market and structural problems. For example, PGMs have seen a notable downturn primarily due to increased competition from recycled sources and uncertain demand (Minerals Council SA, 2025c). A notable increase in Section 189 retrenchment notices has been observed across the Mining, Energy, And Metals Sectors in 2025 (NUM, 2025). Labour unions, such as the National Union of Mineworkers (NUM), have called for stricter retrenchment regulations and enhanced government intervention to protect employment and promote sustainable business models within the mining sector (NUM, 2025). The socio-economic impact of these retrenchments is significant, as many displaced workers lack the skills required to transition into alternative employment (Landiswa et al., 2019). To this end, it is important for the MQA to bridge this gap through targeted skills development initiatives, including reskilling, cross-skilling, and upskilling programs for unemployed individuals.

1.6. Labour Market Profile

The labour market profile, constructed using the May 2025 WSP-ATR dataset, has been used to provide the representation of the sector. This section presents the current employment landscape within the MMS, offering a five-year trend analysis. It explores key demographic the MMS' workforce, including gender, race, disability, age, occupational level, and higher education levels. The first section of the analysis presents the overall employment figures, which serve as a foundational baseline for evaluating subsequent demographic breakdowns beginning with the number of MMS employees as seen in figure 1.5. below.

1.6.1. Number of employees in the MMS (2021-2025)

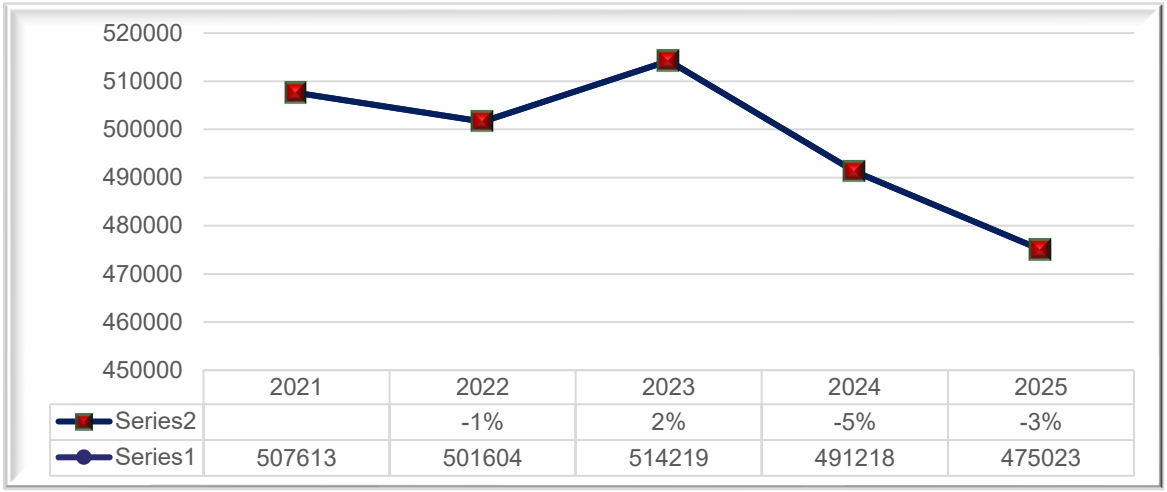


Figure 1. 5: Number of employees in the MMS (2021-2025

Source: MQA WSP-ATR (31 May 2025)

Figure 1.5. illustrates that the South African MMS experienced fluctuations in employment between 2021 and 2025, with a peak of 514,219 employees in 2023 and a decrease to 475,023 in 2025. A significant correlation exists between the declining unemployment rates and downturns in the mining subsectors such as diamond processing and PGM mining. Due to the weaker global diamond market and falling rough diamond prices, the diamond processing subsector is experiencing a decline (Department of Mineral and Petroleum Resources, 2025). Moreover, the contraction of the PGM sector has resulted in a decrease in mining productivity and profitability in South Africa, resulting in a reduction in tax revenues and impacting the sector employment (Mishra, 2025). Through internships, learnerships, apprenticeships, and work experience, MQA continues to provide targeted interventions designed to address unemployment through skills development, training, and initiatives designed to enhance job readiness.

1.6.2. Employment by subsector

Table 1.9. below presents the employment profile of the MMS workforce by subsector.

Table 1. 9: Employment by Subsector (2021-2025)

Subsector	2021	2022	2023	2024	2025	% Change 2021-2022	% Change 2022-2023	% Change 2023-2024	% Change 2024-2025	Average Annual % Change	Total % Change (2021-2025)
CLAS	**6 829**	**12 275**	**12 275**	**9 947**	**10 313**	**79,7%**	**0,0%**	**-19,0%**	**3,7%**	**16,1%**	**51,0%**
Coal mining	91 271	91 123	94 437	98 431	85 720	**-0,2%**	**3,6%**	**4,2%**	**-12,9%**	**-1,3%**	**-6,1%**
Diamond mining	13 889	13 489	15 825	11 620	11 786	**-2,9%**	**17,3%**	**-26,6%**	**1,4%**	**-2,7%**	**-15,1%**
Diamond processing	1 626	1 408	1 408	448	476	**-13,4%**	**0,0%**	**-68,2%**	**6,3%**	**-18,8%**	**-70,7%**
Gold mining	93 537	92 452	93 988	81 357	77 731	**-1,2%**	**1,7%**	**-13,4%**	**-4,5%**	**-4,3%**	**-16,9%**
Jewellery manufacturing	1 811	2 317	2 317	1 642	1 492	**27,9%**	**0,0%**	**-29,1%**	**-9,1%**	**-2,6%**	**-17,6%**
Other mining	**77 210**	**78 494**	**79 545**	**107 203**	**112 764**	**1,7%**	**1,3%**	**34,8%**	**5,2%**	**10,7%**	**46,0%**
PGM mining	165 308	177 780	182 158	151 369	145 852	**7,5%**	**2,5%**	**-16,9%**	**-3,6%**	**-2,6%**	**-11,8%**
Services incidental to mining	56 132	32 266	32 266	29 201	28 889	**-42,5%**	**0,0%**	**-9,5%**	**-1,1%**	**-13,3%**	**-48,5%**
Total	**507 613**	**501 604**	**514 219**	**491 218**	**475 023**	**-1,2%**	**2,5%**	**-4,5%**	**-3,3%**	**-6,5%**	**-6,4%**

Source: MQA WSP-ATR (31 May 2025)

Table 1.9 illustrates the employment profile of the MMS workforce by subsector between 2021 and 2025. Over the past five years, there has been a substantial increase in employment rates for both the CLAS and Other Mining subsectors. All other subsectors exhibited a decline in employment rates over a five-year period, apart from the CLAS and Other Mining subsectors. There have been significant job losses in the Diamond Processing Subsector due to the downturn, which can be attributed to the, among others, growing competition from synthetic diamonds which causes a sharp decline in demand for natural diamonds (Minerals Council South Africa, 2022). The Coal Mining Subsector has also experienced an employment decline (-6.1) over a five-year period as a result of the paradigm shift caused by the Just Energy Transition. The global transition towards cleaner energy sources and decarbonization has led to the closure of coal-fired power plants, thereby reducing the demand for coal and precipitating significant job losses within the Coal Mining Subsector (Mohlakoana, Rathupetsane, Malope and Jacob, 2024). The loss of jobs in the MMS necessitates MQA to continuously focus on developing and implementing training programmes that reskill or upskill unemployed individuals, equipping them with skills that meet emerging sectoral demands.

1.6.3. Employment by Gender

Table 1.10. below illustrates the gender distribution trend of employees in the South African MMS from 2021 to 2025.


Table 1. 10: Gender Distribution Trends Analysis (2021-2025)

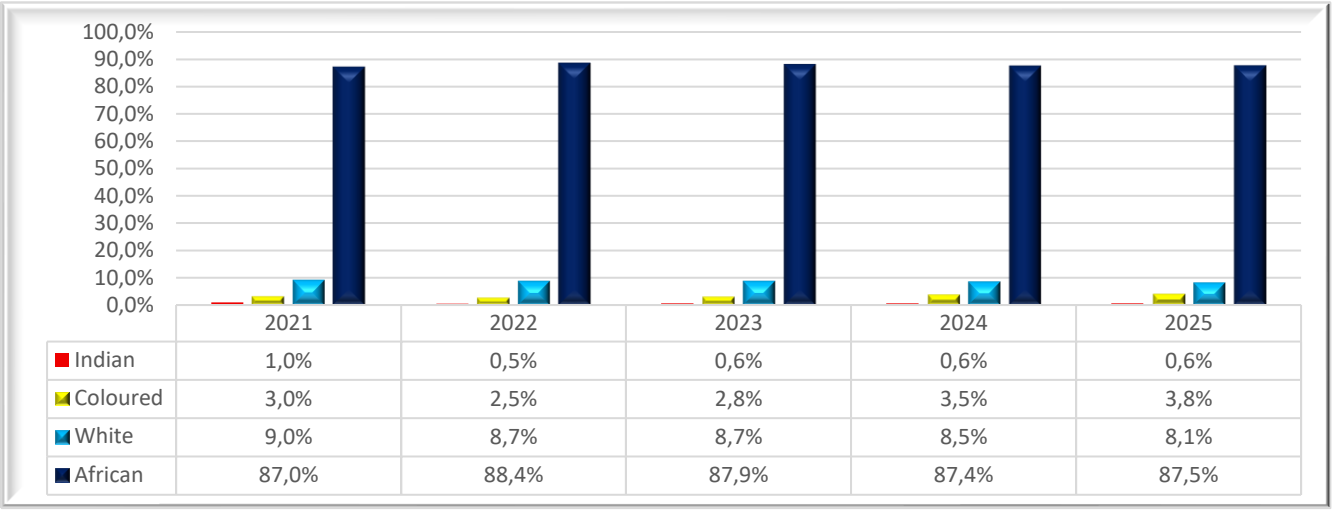
Gender distribution	Males		Females		Total no. of employees
	%	Count	%	Count	
2021	83,0%	421319	17,0%	86294	507613
2022	81,6%	409309	18,4%	92295	501604
2023	80,8%	415489	19,2%	98730	514219
2024	79,8%	391992	20,2%	99226	491218
2025	79.0%	375085	21.0%	99938	475023

Source: MQA WSP-ATR (31 May 2025)

Table 1.10. reveals that Male employees have consistently constituted most of the MMS workforce, declining marginally from 83% in 2021 to 79% in 2025. Conversely, female representation has increased slightly from 17% to 21% over the same period. The MQA is actively advancing inclusivity through various initiatives such as skills development programmes which help HDSA and female students pursuing mining-related qualifications. Among others, MQA provides bursaries, learnerships and training programmes that benefits women to acquire relevant qualifications and competencies required for careers in the mining industry. These programmes provide both technical and leadership competencies that addresses the specific needs of women, thereby facilitating their success and progression within the mining sector. The total number of 303 beneficiaries were funded by MQA to be trained in small scale mining in 2024/25. Out of 303 beneficiaries, 168 were female beneficiaries. In addition, 478 MQA funded female leaners completed their artisan programme in 2024/25. The total number of 101 females also completed Management and Development Programme funded by the MQA. By implementing focused skills development programmes, MQA continues to create a conducive environment that promotes the progress of women in the MMS.

1.6.4. Employment by Race

Figure 1.6. below delves into the racial profile of employees in the South African MMS from 2021 to 2025.



	2021	2022	2023	2024	2025
Indian	1,0%	0,5%	0,6%	0,6%	0,6%
Coloured	3,0%	2,5%	2,8%	3,5%	3,8%
White	9,0%	8,7%	8,7%	8,5%	8,1%
African	87,0%	88,4%	87,9%	87,4%	87,5%

Figure 1. 6: Employment by Race (2021-2025)

Source: MQA WSP-ATR (31 May 2025)

Table 1.6. shows the employment of the workforce by race and the dominance of African employees within the MMS. A trend that aligns with the broader demographic composition of the country. According to the mid-year population estimates published by Statistics South Africa (2025), Black Africans constitute approximately 82% of the national population. Additionally, Figure 6 indicate a consistent decline in the representation of the white workforce over the five-year period under review. Conversely, the proportion of the Coloured workforce has shown a gradual increase, rising from 3.0% in 2021 to 3.8% in 2025. The Indian workforce remains the smallest demographic group within the MMS.

1.6.4.1. Employment by Management and Race (2021-2025)

Table 1.11 below presents racial representation of employment by management levels from 2021 to 2025.

Table 1. 11: Employment by Management and Race

Management Level	Year	African	Coloured	Indian	White
Junior management, supervisors, foremen and superintendents	2021	69,2%	5,4%	1,0%	24,4%
	2022	73,2%	4,1%	0,9%	21,9%
	2023	73,2%	4,1%	0,9%	21,9%
	2024	73,4%	4,4%	1,0%	21,1%
	2025	75,4%	5,6%	1.0%	18,2%
Middle management	2021	48,9%	5,5%	3,8%	41,8%
	2022	52,5%	4,6%	3,8%	39,0%
	2023	52,5%	4,6%	3,8%	39,0%
	2024	54,3%	4,6%	4,0%	37,1%
	2025	59.1%	5,0%	3,5%	32,0%
Senior management	2021	34,7%	3,7%	5,3%	56,3%
	2022	42,6%	3,3%	5,0%	49,2%
	2023	42,6%	3,3%	5,0%	49,2%
	2024	40,9%	3,8%	5,3%	50,0%
	2025	42,2%	4,0%	6,1%	47,7%
Top management	2021	32,2%	4,2%	4,5%	59,1%
	2022	35,6%	4,1%	4,4%	55,9%
	2023	35,6%	4,1%	4,4%	55,9%
	2024	40,5%	3,5%	3,7%	52,3%
	2025	38,2%	3,9%	5,1%	52,8%

Source: MQA WSP-ATR (31 May 2025)

At junior management, African representation increased from 69.2% to 75.4%, while White representation declined from 24.4% to 18.2%. Coloured representation fluctuated over the years starting from 5.4% in 2021 to 5.6% 2025. Indian workforce is the smallest at junior management level. Middle management level is characterised by an increasing African workforce with 48.9 in 2021 and 59.1% in 2025. White workforce at middle management shows declining trend with 41.8 in 2021 and 32.0 in 2025. Indian and coloured representation at middle management fluctuated over five-year period. In terms of senior management, the African workforce representation increased from 34.7% in 2021 to 42.2% in 2025. Although white workforce is dominating in the middle management, their representation is consistently declining over the years with 56.3% in 2021 to 47.7% in 2025. Indian workforce is experiencing consistent increase in the senior management level with 5.3% in 2021 to 6.1% in 2025.

White workforce dominates top management level with 59.1% in 2021 to 52.8% in 2025. The Africans representation at top management level is consistently increasing from 32.2% in 2021 to 38.2% in 2025. Coloured representation at top management level shows declining trend from 4.2% in 2021 to 3.9% in 2025. Lastly, Indian representation slightly increased over the years at top management level from 4.5% in 2021 to 5.1% in 2025. Averall, the increase of Africans, coloured and Indians in management positions within the MMS can be ascribed to the Management and Executive Development Programme (MEDP), which is supported and financed by the MQA. The MEDP is designed to enhance the managerial competencies of employees within the MMS, with a particular emphasis on advancing Historically Disadvantaged South Africans (HDSAs) into leadership positions. The programme encompasses a series of short courses covering areas such as leadership, coaching, mentoring, strategic thinking, negotiation, and various other management skills.

1.6.5. Employment by Age

Figure 1.7. below illustrates the age distribution of the MMS workforce over the period 2021 to 2025.

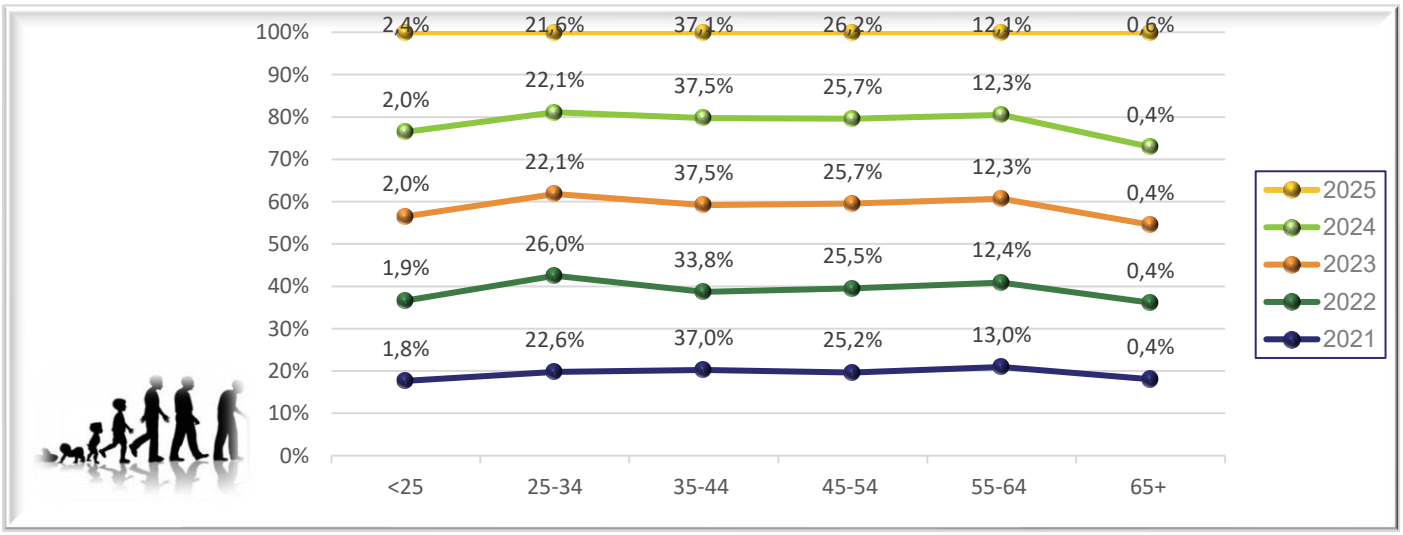


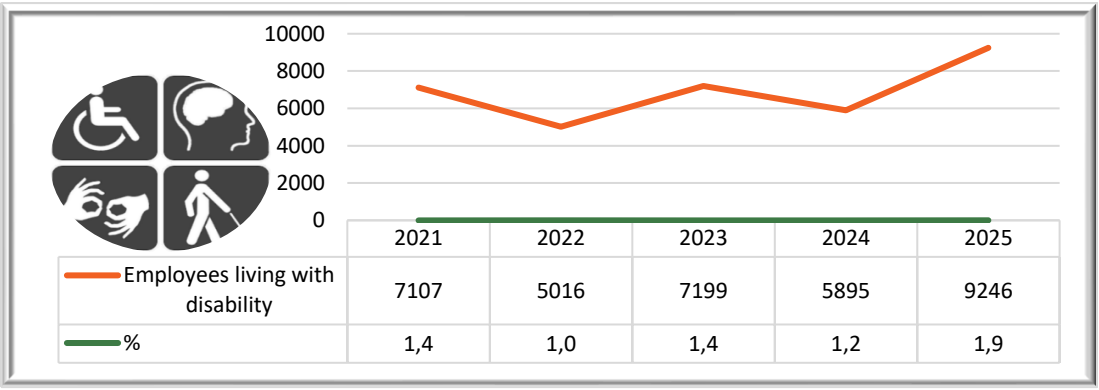
Figure 1. 7: Employment by Age
Source: MQA WSP-ATR (31 May 2025)

The MMS workforce is predominantly mature, with the 35-44 and 45-54 age groups consistently forming the largest segments, indicating a strong reliance on experienced professionals. Conversely, the youngest demographic (<25) represents a very small proportion while the 25-34 age group shows fluctuations in its presence. The reduction in the youngest demographic cohort can be attributed to the decreasing enrolment trends in qualifications related to MMS. (DHET, HEMIS Data, 2019-2025). Employment opportunities in the MMS are often situated in rural or remote regions, whereas younger individuals tend to favour urban settings. Additionally, there is a widespread migration away from rural areas, which diminishes the number of young people available to fill positions within the MMS (McBride, 2022). A considerable proportion of

employees in the 55-64 age group highlights an impending wave of retirements, indicating the critical need for robust succession planning and knowledge transfer strategies to ensure the long-term sustainability and skills retention within the sector.

1.6.6. Employment by disability

Figure 1.8. below presents an analysis of employment of people with disabilities (PWDs) in the MMS over the past five years (2020-2025).



	2021	2022	2023	2024	2025
Employees living with disability	7107	5016	7199	5895	9246
%	1,4	1,0	1,4	1,2	1,9

Figure 1. 8: Employment by disability
Source: MQA WSP- ATR (31 May 2025)

The proportion of PWDs employees has fluctuated over the years, with a peak in 2025 at an average of 1,9%. The MQA's study on "Factors impeding the attainment of equity targets concerning PWDs in the MMS" revealed a disparity between the training programmes offered within the MMS and its goal of attracting and retaining persons with disabilities (PWDs). The study also notes the lack of training programmes specifically designed to address the unique challenges faced by PWDs in the MMS. Training programmes frequently do not incorporate customized curricula or support structures specifically designed for persons with disabilities (PWDs). Additionally, there is often a deficiency in the provision of reasonable accommodations during training—such as adaptive technologies and flexible scheduling—which can hinder the development of skills and preparedness for professional careers (Maphosa, 2023). The absence of specialised training for PWDs in the MMS exacerbates skill gaps, as conventional programmes prioritize core mining competencies that may not align with their capabilities. Furthermore, employers tend to overemphasise physical requirements, neglecting the transferable skills PWDs possess, such as problem-solving and communication. Addressing these disparities through inclusive training initiatives is important to enhance workforce diversity and equity in the MMS.

1.6.7. Employment by Major Occupation

Table 1.12 below illustrates the employment profile of the MMS from the lens of major occupational level from 2021 to 2025.

Table 1. 12: Employment by major occupational level

Employment by Major OFO	No. & %. of employees	Employment by occupational level				
		2021	2022	2023	2024	2025
Managers	N	9206	12402	13370	14024	14013
	%	2,7%	2,5%	2,6%	2,9%	2,9%
Professionals	N	17072	24239	24683	24902	25382
	%	5,0%	4,8%	4,8%	5,1%	5,3%
Technicians and Associate Professionals	N	43307	77975	73533	72260	72684
	%	12,6%	15,5%	14,3%	14,7%	15,3%
Clerical Support Workers	N	14386	19769	21597	20170	20269
	%	4,2%	3,9%	4,2%	4,1%	4,3%
Service and Sales Workers	N	3796	5636	7 199	6633	5033
	%	1,1%	1,1%	1,4%	1,4%	1,1%
Skilled Agricultural, Forestry, Fishery, Craft and Related Trades Workers	N	26517	42590	48337	46022	45596
	%	7,7%	8,5%	9,4%	9,4%	9,6%
Plant and Machine Operators and Assemblers	**N**	**137688**	**196262**	**188204**	**184878**	**171596**
	%	**40,0%**	**39,1%**	**36,6%**	**37,6%**	**36,1%**
Elementary Occupations	**N**	**85885**	**109706**	**137296**	**103449**	**100790**
	%	**24,9%**	**21,9%**	**26,7%**	**21,1%**	**21,2%**
Learner	N	6464	_	_	18880	19660
	%	1,9%	_	_	3,8%	4,1%
Total	**N**	**344321**	**501604**	**514 219**	**491218**	**475023**

Source: MQA WSP- ATR (31 May 2025)

Table 1.12. reveals a workforce heavily concentrated in operational roles, with Plant and Machine Operators and Assemblers consistently forming the largest cohort, though their proportion decreased from 40% in 2021 to 36.1% in 2025. Elementary Occupations constitute the second-largest group, fluctuating significantly but generally declining from 24.9% in 2021 to 21.2% in 2025. Conversely, Technicians and Associate Professionals, and Skilled Agricultural, Forestry, Fishery, Craft and Related Trades Workers both exhibited notable growth in their representation, increasing from 12.6% to 15.3% and 7.7% to 9.6% respectively, suggesting a gradual upskilling or shift towards more specialised technical and craft roles. Managers and Professionals, while showing slight percentage increases, remain relatively small representations of the overall workforce, while Clerical Support Workers and Service and Sales Workers maintain consistently lower, stable proportions.

1.6.6. Employment by Higher Education

Table 1.13. below presents the educational profile of the MMS workforce.

Table 1. 13: Employment by Highest Education

Highest qualifications	2021	2022	2023	2024	2025
No Schooling	0,8%	2,2%	2.0%	1,1%	1,7%
AET Level 1 / Grade 1-3	2,0%	3,8%	2.4%	1,6%	1,0%
AET Level 2 / Grade 4-6	3,1%	3,2%	3.3%	2,6%	1,5%
AET Level 3 / Grade 7-8	5,2%	5,2%	4.0%	3,6%	2,8%
AET Level 4 /Grade 9 / Standard 7 / Form 2 / Level 1 Occupational Certificate	4,2%	3,6%	5.9%	5,6%	6,2%

Highest qualifications	2021	2022	2023	2024	2025
Grade 10 / Standard 8 / Form 3 / National Certificate Vocational (NCV) Level 2 / Level 2 Occupational Certificate / N1(NATED Level 1) / Elementary Certificate	10,0%	9,0%	7.2%	8,0%	7,6%
Grade 11 / Standard 9 / Form 4 / National Certificate Vocational (NCV) Level 3) / Level 3 Occupational Certificate / N2 (NATED Level 2) / Intermediate Certificate	8,6%	9,8%	10.4%	11,0%	10,7%
Grade 12 / Standard 10 / Form 5 / National Senior Certificate / Matric / National Certificate Vocational (NCV Level 4) / Level 4 Occupational Certificate / N3 (NATED Level 3)	**29,8%**	**37,1%**	**39.5%**	**40,4%**	**43,2%**
N4, N5 or N6 (NATED 4, 5 or 6) or NTC 4, 5 or 6 or Higher Certificate or Artisanal Trade Certificate	5,6%	2,9%	1.9% 1.8% 2.7%	7,4%	7,5%
Diploma / National Diploma / N Diploma / Advanced Certificate	2,2%	6,9%	3.2%	3,7%	4,2%
Bachelor's Degree / Higher Diploma / B-Tech Diploma / Advanced Diploma	1,0%	2,7%	3.0%	3,2%	3,6%
Honours Degree / Postgraduate Diploma	_	0,8%	0.9%	1,0%	1,0%
Master's Degree	0,3%	0,4%	0.4%	0,5%	0,5%
Doctorate	0,0%	0,0%	0.1%	0,1%	0,1%
Other	_	_	2.4%	2,7%	2,0%
Unknown	19,4%	12,4%	8.9%	7,6%	6,6%

Source: MQA WSP- ATR (31 May 2025)

As seen above, the MMS has experienced a significant transformation in the educational landscape over the past five years. The sector has transformed significantly, with a workforce now largely holding a Grade 12/Matric certificate as a highest qualification, increasing from 29.8% in 2021 to 43.2% in 2025. Lower educational levels have declined, while higher education qualifications show modest growth. Postgraduate degrees remain minimal, and the "Unknown" category has dropped from 19.4% to 6.6%, enhancing workforce data clarity over time. While a Matric certificate is foundational, it may not meet future needs in expanding occupational categories. Slow growth in higher qualifications highlights a gap between current progress and the demand for specialised expertise in modern mining (Tyson, 2024). The MMS must prioritise investments in higher training pathways to address future skills needs to remain competitive.

1.7. Conclusion

The chapter presented the sector profile of the MMS, highlighting its scope of coverage and key role players. Following this, an employer profile thorough labour market analysis was presented, highlighting the sector's economic performance and employee profile by demographics. The analysis of the MMS profile paints a complex picture with significant implications for skills development. Geographically, while most employers are located in Gauteng, the MQA needs to ensure its programmes reach miners and employers across all provinces. This might involve utilising online learning platforms that can bridge geographical distances and strengthening existing partnerships with regional training providers to offer accessible in-person training.

The chapter demonstrated that the South African MMS is undergoing a dynamic shift. The demographics of the MMS workforce paint a picture of a middle-aged workforce (35-44, =37.1%) with a significant gender imbalance (females= 21%). Furthermore, the high proportion of employees in Plant and Operator roles (36.1%) reflects the industry's current focus on operational and labour-intensive tasks. However, future-

proofing the workforce requires a shift towards skills development in areas critical for the sector's future success. This includes digital literacy to navigate the increasing automation of mining processes, data analysis to make data-driven decisions, and expertise in renewable energy as the industry transitions towards more sustainable practices. Moreover, the low representation of people with disabilities (1.9%) suggests a lack of inclusivity within the MMS. To tap into this underutilised talent pool and create a more diverse and representative workforce, the sector should look at implementing disability awareness training, and explore possibilities for job redesign to accommodate employees with disabilities.

Demographic changes present both challenges and opportunities. Moreover, the prevalence of small mines within the MMS necessitates a shift towards cost-effective and accessible skills development programmes. Traditional lengthy training modules might not be suitable for these resource-constrained operations. Leveraging technology for remote learning can further enhance accessibility for geographically dispersed miners working in small mines. To address this, the MQA is at the forefront of addressing these shifts, with a strategic vision for a more inclusive and future-oriented workforce.

The MQA's commitment to addressing demographic shifts within the MMS extends beyond simply increasing representation. It entails building a future-proof mining industry in the country. By fostering a more inclusive and skilled workforce, the MQA is laying the groundwork for long-term sustainability and growth. A one-size-fits-all approach to skills development will not work for the diverse subsectors within the MMS. "Other Mining" and "Services incidental to mining" for example, have distinct operational needs and require specific skillsets. To optimise the impact of training initiatives, the MQA will need to tailor programmes to address the high-demand skills within each subsector. Collaboration with mining companies is important as it can provide valuable insights into these specific skills needs. By working collectively, the MQA and mining companies can develop targeted training programmes that effectively address these industry gaps and ensure miners have the necessary qualifications to succeed in their specific role

CHAPTER 2: KEY SKILLS CHANGE DRIVERS

2.1. Introduction

This chapter examines the key change drivers and presents the policy frameworks affecting skills demand and supply in the MMS. The key change drivers are extracted from the literature, previous MQA studies, inputs from different social actors within the MMS in platforms such as the 2025 Africa Mining Indaba, Inaugural MQA' Skills Lekgotla, the MINTEK Symposium 2024, SETA Skills Summit 2024, the 2025 MQA Research Colloquium, interviews and focus group discussions held with various stakeholders. Analysing the change drivers affecting skills demand and supply in the MMS, alongside policies and strategies provide a comprehensive understanding of the forces at play in the MMS skills landscape. Understanding these combined elements is essential for stakeholders to stay informed about current skills needs, anticipate future demands, and develop targeted training programmes. This proactive approach allows for effective resource allocation and interventions to address occupational shortages and skill gaps, ultimately enhancing workforce capabilities and ensuring the continued growth and competitiveness of the MMS. The first section reflects on the sector's key skills change drivers.

2.2. A Reflection of the Past Five Years

The past five years (2021–2025) have witnessed substantial transformation in the MMS, driven by advancements in technology, an intensified emphasis on environmental sustainability, and shifts in global market dynamics. Automation and digital innovations have minimised reliance on manual labour while increasing the demand for technical specialists, data analysts, and experts in renewable energy and environmental management. This transformation underscores the growing importance of digital literacy, soft skills, and workforce adaptability. As the sector approaches the 2026–2027 planning cycle, these trends are anticipated to accelerate, necessitating continuous upskilling and reskilling to equip the workforce for an increasingly dynamic industry. Key drivers of change during this period have significantly influenced MMS operations and the skills required to navigate these evolving challenges. The following sections examine these drivers and their implications for workforce development.

2.3. The Future Landscape: Change Drivers in the MMS and their Skills Implications

2.3.1. Technological innovation and application

The MMS is undergoing a significant transformation driven by the Fourth Industrial Revolution (4IR), including cloud computing, artificial intelligence (AI), robotics, and the Internet of Things (IoT). According to the MQA (2024) study on the impact of 4IR, employers express optimism about the potential of these technologies to enhance operational efficiency and safety. The adoption of automation and advanced technologies is expected to streamline processes, reduce task completion times, and ultimately increase productivity. However, the integration of 4IR technologies presents challenges, including job displacement and the widening of skill gaps. Automation may replace tasks traditionally performed by low- and semi-skilled workers, potentially leading to job losses (MQA, 2024). Simultaneously, the rapid emergence of new technologies creates demand for advanced skills, which the education system may struggle to supply (DHET, 2022). Private training providers in the MMS highlight that traditional training materials fail to prepare employees for the sector's technological advancements. This calls for updated, standardised materials and addressing challenges such as low digital literacy. While e-learning is growing due to safety benefits, technology adoption remains a key challenge. The critical challenge is to establish a mutually beneficial relationships between minimising potential job losses and leveraging the advantages of technological transformation in the MMS. This requires a dual-pronged strategy:

- **Upskilling and reskilling the workforce:** Equipping the workforce with essential skills to adapt to workplace changes is crucial for minimising job displacement and ensuring a smooth transition to a technology-driven future.
- **Adapting training programmes to the sector's needs:** Training programmes need to evolve with emerging technologies and industry-specific skills to equip graduates for seamless entry into the sector, thereby building a skilled workforce that enhances the competitiveness of the MMS.

2.3.2. Support for Artisanal and Small-Scale Mining (ASM) and Mineral Beneficiation

The future of the South African MMS increasingly acknowledges the potential of ASM to drive sustainability and inclusivity. ASM is seen as a catalyst for economic development, community empowerment, and addressing challenges such as unemployment and inequality. The MQA Inaugural Mining Skills Lekgotla identified ASM as a key driver of change, particularly in areas without large-scale mining. However, stakeholders highlighted challenges such as the sector's informal nature, complex licensing processes, and limited legislative support, which hinder its formalisation and growth. Informality restricts miners' access to resources and markets while complicating regulatory oversight. Addressing these barriers is essential for ASM to contribute meaningfully to the MMS.

Categorising ASM activities based on scale, impact, and resource type would enable more nuanced and effective regulation. Encouraging local community participation promotes ownership and responsible mining practices, while aligning mining permits with project lifecycles offers operational flexibility and ensures responsible closure practices. Addressing these areas could formalise and sustain the sector, enhancing its economic and contributions. To advance these reforms, stakeholders such as the MQA, DMPR, Mintek, and Minerals Council South Africa can play a pivotal role.

Furthermore, the MQA Mining Skills Lekgotla identified mineral beneficiation as a key driver. Mineral beneficiation transforms raw ore into higher-value products through processes such as crushing, grinding, separating, and refining to meet market needs. It boosts the MMS economy by adding value to raw materials. Beneficiation is a national priority for South Africa. The Critical Minerals and Metals Strategy calls for domestic processing of raw materials to add value, which will help create jobs, grow the economy, and develop local industries. Skilled professionals are essential for identifying opportunities, designing processes, and optimising operations.

Several challenges have been identified affecting the levels of beneficiation in the country. Specific challenges in diamond beneficiation include limited commercial viability due to global economic factors and pricing constraints. Strengthening the downstream diamond value chain, as supported by legislation, can drive sector growth and benefit related industries. Expansion plans by De Beers and Petra could revitalize the sector, offsetting risks from declining production. The integration of a robust ASM sector with a well-established mineral beneficiation industry constitutes a pivotal driver of economic growth and development within South Africa's MMS. By addressing existing challenges and capitalizing on emerging opportunities, South Africa can harness the full potential of these sectors, thereby promoting sustainable and inclusive economic development.

2.3.3. Limited energy supply and the demand for renewable energy sources (solar, wind, hydrogen etc)

Electricity reliability remains a critical issue in South Africa, with persistent infrastructure challenges hindering

the MMS (Dunne, 2025). Despite government efforts, including grid expansion and (Independent Power Producers) IPP involvement, energy constraints persist, requiring skilled workers to install and maintain alternative systems. Hydrogen economy presents a clean and versatile solution for power generation, transportation, and industrial processes. However, green hydrogen development in South Africa faces four key challenges: low awareness and preparedness among stakeholders, regulatory uncertainty, infrastructure limitations, and future skills imbalances (MQA research study on Hydrogen, 2025). Addressing these challenges requires awareness campaigns, regulatory reform, infrastructure investment, and skills planning. Despite these challenges, green hydrogen offers opportunities for MMS to diversify energy sources, reduce fossil fuel reliance, and position South Africa as a global leader in green hydrogen production and trade (Metcalfe et al., 2020).

2.3.4. Youth Migration and the Challenge of NEETs: A Skills Gap for Rural Development

The migration of youth from rural to urban areas, coupled with the high prevalence of NEETs, poses a dual challenge for the MMS. In the first quarter of 2025, the NEET rate among individuals aged 15–24 was 37.1%, with young women (37.5%) marginally more affected than young men (36.7%). This disparity becomes more pronounced within the broader 15–34 age bracket, where the NEET rate reached 45.1% (Statistics South Africa, 2025). Notably, 48.1% of women in this group were classified as NEET, compared to 42.2% of men, underscoring a persistent gender gap in employment and skills development opportunities. This trend not only diminishes the rural talent pool but also overlooks the untapped potential of NEET youth. To mitigate this, the MQA is looking at partnering with rural TVET Colleges and Community Education and Training (CET) institutions to develop and implement targeted training and apprenticeship programmes. These initiatives aim to equip NEET youth with essential skills, thereby strengthening the local workforce and fostering economic development in rural areas.

2.3.5. Globalisation: Skills Development for the MMS in a Changing World

Globalisation exerts a profound influence on the South African MMS by facilitating access to new markets and driving the demand for a skilled workforce adept at navigating diverse cultural and regulatory landscapes. This interconnectedness fosters innovation through cross-border collaboration, knowledge sharing, and advancements in mining techniques, safety protocols, and environmental sustainability. Nevertheless, globalisation also presents challenges, including the adverse effects of U.S. tariffs on South African mineral exports, which could diminish global demand and undermine economic stability (IOL, 2025). China's economic slowdown, especially in construction and property, has reduced steel demand, impacting key raw materials such as iron ore, manganese, zinc, copper, and ferrochrome (Freight News, 2025). South Africa, a major exporter of these commodities, faces declining export volumes, falling share prices, and job losses in subsectors such as PGMs due to global metal price drops. Additionally, the reliance on coal for electricity creates investment uncertainty amid global decarbonization trends.

2.3.6. Skills demand and supply implications of key skills change drivers

Table 2.1. below illustrates the skills demand and supply implications of the above key skills change drivers.

Table 2. 1: MMS Change Drivers and their Skills Demand and Supply Implications

Change Driver	Sectoral Impacts	Demand Skills Implications	Supply Skills implications
Technological innovation and application	* Increased efficiency & productivity. *Improved safety standards. * Potential for new tech-related jobs.	* Demand for data analysis, AI, robotics, automation skills. * Importance of problem-solving, critical thinking. * Digital literacy across all workforce levels.	* A need for collaboration with education and training faculties to institute learning outcomes that feature 4IR Adoption.
Artisanal and Small-scale Mining	* Economic development; Community empowerment.	Skills gaps in: Business development; Technical mining	Support for training programmes: *Business development skills.

Change Driver	Sectoral Impacts	Demand Skills Implications	Supply Skills implications
	* Promotion of sustainable mining. *The diversification of minerals extraction due to small-scale mining	skills; Entrepreneurial skills; Basic environmental impact assessment;	* Technical mining skills. * Entrepreneurial skills. *Basic environmental impact assessment, land reclamation and rehabilitation, and sustainable mining practices *Basic financial literacy, cost estimation, marketing, and sales.
Mineral beneficiation	* Higher export earnings, job creation and overall economic growth. * Less reliance on raw mineral exports, diversification, new technologies and innovations in processing methods.	* Demands for expertise in: Primary, secondary, tertiary, and final stages of beneficiation; cross-cutting and business development skills * Marketing and sales expertise	* Metallurgical and chemical engineering, process control, equipment operation, service and maintenance, and laboratory analysis, * Industrial engineering, toolmaking, product design, and specialised skills such as battery chemistry * Regulatory compliance, environmental management, logistics, project management, quality control, and innovation-driven technology proficiency.
NEET (Shrinking Talent Pool in Rural Areas & Limited Local Workforce Development)	* Difficulty filling critical mining roles. * Hindrance to future growth in rural mining areas. * Rising competition for skills, driving up wages. * Increased reliance on automation or importing skilled labour from outside rural areas.	* Skills gaps in the MMS may widen. * Need for attracting skilled employees to remote locations.	* Focus on transferable skills development that can be applied within the MMS, even for those without prior mining experience. * Collaboration with educational institutions to develop training programmes aligned with the specific needs of the MMS.
Limited energy supply & demand for renewable energy sources (Positive Sectoral Impacts & Challenges)	* Reduced disruptions from load shedding * Lower operating costs in the long term * More sustainable mining practices * High upfront infrastructure costs * Grid integration and storage solutions * Potential land-use issues	* Creates new employment opportunities * Collaboration needed for training development	* Requires new forms of education and training faculties. * Coordination on a large scale across all entities in the sector.
Globalisation (USA Tariff Driven Global Trade)	* 30% Tariffs to directly affect other mining (iron ore), diamonds and CLAS (granulated slag) subsectors PGMs will face indirect impacts, as U.S. vehicle tariffs could curb auto demand	* Lower demand for mining-related skills (extraction, processing, and logistics.) * Depressed demand: metallurgical and engineering skills.	* Dampened interest in mining careers and reduced funding for skills development programmes. * Under-enrolment in mining-related qualifications. * Damped private and public investment in upskilling and reskilling initiatives. * Poor alignment with evolving industry needs; inability to adapt to new technologies or diversification strategies.

2.4. Policy Frameworks in the MMS

Effective skills planning for the South African MMS requires careful consideration of national policies and strategies. This section delves into the intricate interplay between national policies and the evolving skills development landscape in the MMS.

2.4.1. MQA's Response to National Strategies and Plans: A Focus on Skills Development in the Evolving Mining and Minerals Sector

The MQA has actively supported national strategies over the past five years, including the Minerals and Petroleum Resources Development Act, MTDP, HRD Strategy for South Africa, and the Economic Reconstruction and Recovery Plan. Key efforts include aligning skills development with national goals, engaging stakeholders, updating TVET programmes, and providing workplace experience. The MQA has also supported youth through portable skills programmes in construction, agriculture, and electrical engineering, while prioritising transformation for HDSAs, women, and people with disabilities. Additionally, it has been supporting the Presidential Youth Employment Intervention by placing TVET graduates in workplaces and promoting entrepreneurship through its small-scale mining programme.

2.4.2. Policy Frameworks Affecting Skills Demand and Supply

The following table 2.2. outlines key policies and strategies that affect MMS skills supply and demand.

Table 2. 2: Policy Frameworks Affecting Skills Demand and Supply

Policy / Strategy	Demand Skills Implications	Supply Skills Implications
2024 -2029 Medium-Term Development Plan	* Identifying skills to support the JET Investment Plan for the hydrogen economy as applicable to the MMS. *Strengthen the partnership with the private sector to unlock the deployment of artisans and TVET graduates through workplace-based placements and work integrated learning opportunities. * Develop Sector Skills Plans in support of skills required in the MMS * Support the implementation of policy directives on preferential procurement to achieve specific transformation to advance and promote businesses owned by persons that are black, women, youth, SMMEs and disabled in the MMS * Implement and report on the Transforming Mentalities initiative in stakeholder PSET institutions through advocacy and capacity-building initiatives	* Training and testing learners in occupations linked to Occupations in High Demand and HTFVs so that an inclusive economy is supported by relevant skills. * Training lecturers to support 4IR related programmes in TVET colleges * Support the implementation of an infrastructure programme to refurbish and/or build new TVET college campuses and establishment of new universities that supply skills to the MMS * Support the implementation of an infrastructure programme for improving Community Education and Training colleges that supply skills to the MMS. * Introduce accredited QCTO skills programmes to improve the responsiveness of CET colleges that supply skills to the MMS
Mining and Petroleum Resources Development Bill (MPRDB)	* Demand for management, scientific, engineering, and other technical skills, especially among historically disadvantaged persons.	* Development of management, scientific, engineering, and other technical skills, especially among historically disadvantaged persons.
White Paper for Post School System	* Potential for a larger pool of skilled individuals entering the MMS workforce. * Increased need of graduates with the necessary technical and soft skills for the MMS.	* Need to assess the alignment between new training programmes and the specific skills required by the MMS. * Strengthen collaboration with educational institutions to develop targeted training programmes specific to the MMS' needs

Policy / Strategy	Demand Skills Implications	Supply Skills Implications
Mineral Beneficiation Strategy	* Conduct industry consultations to identify the most in-demand beneficiation techniques (e.g., mineral sorting, leaching, smelting).	*Partner with Mintek, State Diamond Trader, DMPR, Council for Geoscience & Minerals Councils to establish skills development taskforces focused on beneficiation. * Develop competency-based curriculum for beneficiation process operation and maintenance in collaboration with TVET institutions. Offer these programmes in modular format for flexible learning and upskilling of the existing workforce. * Pilot certificate programmes in specialised areas of mineral beneficiation, working with industry partners to ensure graduates possess the necessary skills for real-world job requirements.
National Development Plan (NDP) (2030)	* Prioritise funding for programmes and interventions aligned with NDP goals, with a focus on recruiting candidates from historically disadvantaged communities.	* Integrate sustainability principles into all MMS training programmes, including environmental management practices, resource efficiency, and social responsibility. This could involve incorporating case studies of successful sustainable mining operations.
National Skills Development Plan (NSDP) 2030	* Reassess funding policy to support high-demand occupations with high growth potential in the MMS (e.g., data analysis, automation specialists). .	* Develop targeted training programmes to address these skill gaps, focusing on a blend of both technical skills (e.g., data analysis tools, automation software) and digital literacy (e.g., data interpretation, problem-solving using technology). *Partner with tech companies to ensure these programmes incorporate the latest industry tools and practices. * Pilot competency-based assessments to evaluate the effectiveness of training programmes and ensure graduates possess the required skillsets for success in the labour market
HRD Strategy for South Africa (2010-2030)	* Encourage participation in skills development programmes by offering flexible learning schedules (e.g., online learning modules, evening classes) and exploring financial assistance options through bursary programmes.	* Promote a culture of lifelong learning within the MMS workforce by establishing partnerships with online learning platforms to offer relevant courses and micro-credentials in specialised MMS skills.
Economic Reconstruction and Recovery Skills Plan (ERRP)	* Increase funding for bursaries to ensure equitable access to training programmes across all demographics, encouraging participation from women, youth, people living with disabilities from disadvantaged communities. * Continue to organise career guidance workshops and industry exposure tours for youth in mining communities to raise awareness of the diverse career paths available in the MMS.	* Expand access to workplace training opportunities (apprenticeships, learnerships, internships) in critical areas identified as experiencing occupational shortages. *Align skills development initiatives with Centres of Specialisation (CoS) to create focused training hubs.
Just Energy Transition Framework (JETF)	* Conduct a skills gap analysis in collaboration with the DMPR, Minerals Council, and CSIR to identify the skills required for a smooth transition to low-carbon energy sources in the MMS.	* Partner with institutions specialising in renewable energy to develop training programmes in areas such as solar, wind, and geothermal energy relevant to the MMS (e.g., renewable energy integration for mine operations, maintenance of renewable energy infrastructure). * Integrate renewable energy technologies and energy management practices into existing MMS training curriculums. This could involve collaborating with universities to develop specialized modules or short courses focused on these emerging areas.
Hydrogen South Africa Strategy (HySA)	* Conduct a skills gap analysis to identify the specific skills required across the hydrogen value	* Partner with allied SETAs, professional bodies, universities, and industry stakeholders to develop training programmes in these areas.

Policy / Strategy	Demand Skills Implications	Supply Skills Implications
	chain (e.g., electrolysis, fuel cell technology, hydrogen storage, pipeline infrastructure). * Focus on attracting and skilling engineers, scientists, technicians, and project managers with expertise in hydrogen technologies.	* Explore opportunities for collaboration with international hydrogen hubs and training providers to leverage global knowledge and best practices. * Develop competency-based standards for hydrogen-related occupations to ensure graduates possess the necessary skills for real-world job requirements. * Offer reskilling and upskilling programmes for existing employees in the mining and energy sectors to transition them into hydrogen-related jobs.
Green Hydrogen Commercialisation Strategy	* Build on the skills gap analysis conducted for the HySA to identify the specific needs for the green hydrogen production segment (e.g., expertise in electrolysis using renewable energy sources, hydrogen production plant operation and maintenance). * Emphasise skills in data analytics and process optimisation to ensure efficient green hydrogen production. .	* Partner with renewable energy companies and electrolyser manufacturers to develop targeted training programmes focused on the integration of these technologies. * Encourage collaboration with international green hydrogen projects to facilitate knowledge transfer and skills development
Artisanal and Small-Scale Mining Policy 2021	* Conduct a skills needs assessment within the ASM sector to identify the skills required for sustainable and safe mining practices. * Promote the integration of digital technologies into ASM operations for improved resource management and safety (e.g., mobile apps for mine planning and data collection).	* Partner with NGOs and community organisations to deliver training programmes in local communities where ASM is prevalent. * Explore the use of mobile training units or blended learning approaches to reach geographically dispersed ASM miners. * Establish mentorship programmes to connect experienced miners with new entrants to the ASM sector.
HRD Strategy for South Africa (2010-2030)	*Intensify efforts to support SMMEs to expand the employer pool for creation of job opportunities. *Continue supporting career awareness programmes, for mining related occupations.	*Expand and accelerate the provision of workplace training in priority skills needs, i.e., number of apprenticeships, learnership & internship opportunities and scaling up funding mechanisms such as bursaries and put in place measures to ensure equity and access to success.
Critical Minerals and Metals Strategy South Africa	* Forecast and respond to emerging skills demands driven by new technologies and environmental imperatives. *Conduct a skills gap analysis to identify the specific skills required.	*Partner with allied SETAs, professional bodies, universities, and industry stakeholders to develop targeted skills interventions for beneficiation, melting and advanced mineral processing.
National Plan for Post-School Education and Training 2021–2030	* Identify occupation-specific skills priorities and address skills mismatches in the MMS, ensuring that education and training institutions produce graduates with relevant skills for the mining economy.	* Develop a coordinated and integrated post-school system that responds to the country's socio-economic needs.
Master Skills Plan of South Africa	* Increasing demand for digital skills, scarce and critical skills, green skills, artisanal and small-scale mining skills.	* Integrate digital skills into training programmes to keep pace with smart mining technologies. * Partner with relevant stakeholders to address critical and scarce Skills *Reskill for Green and Sustainable Mining *Enhance Artisanal and Small-Scale Mining (ASM) Skills
Skills Development Zones	* Tackle specific skills gaps, meet industry needs, make the best use of funding, and engage all key	* Influence broader sector skills planning framework managed by the MQA's SSP.

Policy / Strategy	Demand Skills Implications	Supply Skills Implications
	stakeholders to support sustainable skills development in mining communities.	

In outlining the policies and national strategies affecting the MMS, of particular importance is the 2024-2029 MTDP which highlights the priorities of the Government of National Unity. Table 2.3. below highlights the MQA's efforts to articulate its interventions with the priorities of the MTDP.

Table 2. 3: MTDP 2024-2029 MQA Contributions

MTDP priority	Outcome	Outcome Focus Areas	Interventions	DHET 2029/30 end-term targets	MQA plans in contribution to MTDP
Strategic Priority 1: Inclusive growth and job creation	**A Just Energy Transition**	▪ Identifying Skills to support the Just Energy Transition Investment Plan for the hydrogen economy, new electric vehicles, electricity sectors. ▪ Training and testing learners in occupations linked to Occupations in High Demand and Critical skills so that inclusive economy is supported by relevant skills. ▪ Training lecturers to support 4IR related Programmes in TVET colleges	▪ Establish the JET Skills Desk to inform the skills pipeline for identified sectors. ▪ Establish a JET Advisory Forum through HRDC to build partnerships across stakeholders for the implementation of the JET Skills plan. ▪ Implement a Programme to build the institutional capacity of TVET colleges to train and test artisans linked to Occupations in High Demand and Critical skills so that inclusive economy is supported by relevant skills. ▪ Implement national Initiatives to train at least 500 lecturers each year to support 4IR-related Programmes in TVET colleges	1. Graduates in JET skills produced 2. Graduates absorbed in JET industries (%) *Actual targets on the percentage on production and absorption of graduates will be determined once the JET Skills Desk is established) 3. 2 000 lecturers trained to support 4IR related Programmes in TVET colleges (cumulative 4. 10 000 of learners trained and tested in occupations linked to Occupations in High Demand and Critical skills so that inclusive economy is supported by relevant skills.	1. MQA in partnership with CHIETA and TETA is in the process of establishing hydrogen energy centre of specialisation. 2. The MQA continues conducting research on Just Energy Transition. 3. The MQA offers 95 TVET lecturer exposure to the industry through skills development support programme and 250 TVET colleges lecturers bursaries. However, the choice of the programme depends on what the lecturer requires. 3. The Hydrogen Centre of Specialisation will offer 4IR related skills Programmes to TVET Lecturers. 4. MQA to continue maintaining a target of learners' link to Sector Priority Occupation Interventions (SPOI).
	Increased employment opportunities	• Ensure a stronger and more cooperative relationship between education and training institutions and the workplace	• Strengthen the partnership with the private sector to unlock the deployment of artisans and TVET graduates through workplace-based placements and work integrated learning opportunities. • Develop Sector Skills Plans in support of skills required in various sectors of the economy through the relevant SETAs	1. 600 000 (Cumulative) learners or students placed in Workplace Based Learning Programmes disaggregated as follows: ▪ Internships: 60 000 (Cumulative) ▪ Learnerships: 310 000 (Cumulative) ▪ TVET students or graduates placed in Work Integrated Learning: 110 000 (Cumulative) ▪ Universities students or graduates placed in Work Integrated Learning: 21 100 (Cumulative) ▪ Learners or students placed in	MQA Strategic Plan targets for 2025/26-2029/30: 1. 22 102 (Cumulative) learners or students placed in Workplace Based Learning Programmes disaggregated as follows: ▪ Internships 2 950 (5%) ▪ Learnership for Employed and Unemployed learners 6 800 (2%) ▪ TVET (WIL) 3 000 (3%) ▪ University Work integrated Programme 2 650 (13%)

MTDP priority	Outcome	Outcome Focus Areas	Interventions	DHET 2029/30 end-term targets	MQA plans in contribution to MTDP
				▪ Candidacy Programmes: 6 400 (Cumulative) ▪ Apprenticeships: 92 500 (Cumulative) 2. 352 500 learners registered in skills development programmes (Cumulative)	▪ Candidacy Programme 720 (11%) ▪ Artisans 5 982 (6%) 2. Skills Programme 27 320 (8%)
	Re-industrialisation, localisation and beneficiation	• **Preferential Procurement:** Procuring from qualifying businesses owned by person that are women, black, youth, SMMEs and disabled selected through SCM Requests for Quotations and Tender processes	• Implement policy directives on preferential procurement to achieve specific transformation to advance and promote businesses owned by persons that are black, women, youth, SMMEs and disabled	**Public procurement set aside for:** 1. Women owned business: 40% 2. Youth owned businesses: 30% 3. Black owned businesses: 70% 4. People living disabilities: 7% 5. SMMEs: 30%	**MQA SP 2025/26-2029/30:** 1. Women owned business: 29% 2. Youth owned businesses: 15% 3. Black owned businesses: 52% 4. People living disabilities: 5% 5. SMMEs: 17%

MTDP priority	Outcome	Outcome Focus Areas	Interventions	DHET 2029/30 end-term targets	MQA plans in contribution to MTDP
Strategic Priority 2: Reduce poverty and tackle high cost of living	Skills for the economy	• Increase access, improve the quality and efficiency of the PSET system	▪ Implement an infrastructure Programme to refurbish and/or build new TVET college campuses and establishment of new universities. ▪ Implement an infrastructure Programme for improving Community Education and Training colleges. ▪ Implement blended learning in TVET colleges	1. Two new universities, namely University of Science and Innovation in Ekurhuleni Metro and the University of Policing and Crime Detection in Hammanskraal established: ▪ Funding agreement for the establishment of the two universities approved by 31 March 2026 ▪ 10% of construction completed by 31 March 2027 ▪ 20% of construction completed by 31 March 2028 2. 10 new TVET campuses built (cumulative) by 31 March 2030 3. 14 (Cumulative) Community Learning Centres built by 31 March 2030	1 & 2. The MQA in partnership with other entities and providers plans to pilot hydrogen centres in university of technologies and TVET colleges.
			Develop annual enrolment plans for universities, TVET and CET colleges • Introduce accredited QCTO skills Programmes to improve the responsiveness of the CET college sector	1. 1 219 259 students enrolled in universities annually* 2. 5 139 Doctoral graduates from universities annually* 3. 17 961 Research Masters graduates annually* 4. 600 000 students enrolled in TVET annually 5. 193 180 students enrolled in CET colleges	MQA APP targets for 2025/26: 1, 2 & 3 Bursaries for 70 employed learners and 430 unemployed learners in 2025/26 financial year. (0,04%). ▪ 150 work integrated learning Programme for TVET learners in 2025/26 financial year.(0,03%) ▪ 1 440 CET learners accessing AET Programmes – SP Target. (1%)
	Improved education outcomes and skills	Increase access, improve the quality and efficiency of the PSET system	• Reform NSFAS into a tiered system of bursaries and loans and establish an effective debt collection system by collaborating with the South	1. 460 324 eligible university students receiving funding through NSAFS bursaries annually 2. 321 531 TVET college students receiving funding through NSFAS bursaries annually.	MQA APP targets for 2025/26 & SP 2025/26-2029/30: 1, 2 & 3, 70 employed learners' bursaries and 430 unemployed learners' bursaries for 2025/26 financial year.

MTDP priority	Outcome	Outcome Focus Areas	Interventions	DHET 2029/30 end-term targets	MQA plans in contribution to MTDP
			African Revenue Services, the Credit Bureau, and potential employers. • Implement an increased scope of programmed offerings at CET colleges to include skills, occupational Programmes and non-formal Programmes using funding from the NSF and SETAs.	3. 34 284 eligible university students receiving NSFAS loans. 4. Success rates at universities* (86,7%) 5. 11 000 students complete NC(V) L4 qualification 6. TVET throughput rate (22%) 7. 12 688 students complete GETC qualifications 8. 20% of CET students enrolled in QCTO accredited skills programmes skilled	▪ 1 200 learners completing NC(V) L4 in the MTDP period. (11%) ▪ 6 350 learners completing AET Programme and 1 440 CET leaners accessing AET
		• Improve the responsiveness of the PSET System and produce graduates in scarce skills areas	• Produce Lists of Occupations in High Demand and Critical Skills biennially to: - Inform choices of young people when selecting careers, subjects, or fields of study. - Influence provision of bursaries and scholarships by relevant funding institutions • Inform the review of Programme and Qualification Mix (PQMs) at institutional level	1. 15 992 Graduates in Engineering Sciences from universities annually* 2. 10 661 Graduates in Human Health annually* 3. 718 Graduates in Animal Health from universities annually* 4. 557 Graduates in Ocean Economy Studies (cumulative)* 5. 39 499 Graduates in initial Teacher Education from universities annually* 6. 30 000 Artisans produced per annum (Cumulatively, 140 000 artisans produced by 2030)	MQA APP targets for 2025/26: 1. 80% Engineering 2, 3, 4 & 5. 20% of the MQA bursaries fund learners qualifications from non-core qualifications. 6. 5 550 Artisans for the MTDP period.
	Social cohesion	• Oversight of PSET Policy Framework on	▪ Implement and report on the Transforming MENtalities	1. Number of students and staff in PSET institutions trained through the Civic	1 & 2. 625 career guidance workshops to be conducted in urban and rural areas in the MTDP

MTDP priority	Outcome	Outcome Focus Areas	Interventions	DHET 2029/30 end-term targets	MQA plans in contribution to MTDP
	and nation-building	Gender Based Violence	initiative in the PSET system through policies, advocacy and capacity-building initiatives ▪ Implement and report the National Civic Education and Health Skills Programme	Education and Health skills Programme 2. Number of interventions/initiatives on the Transforming MENtalities implemented	period
Strategic Priority 3: Build a capable, ethical and developmental state	Improved governance and performance of public entities	• Review of legislations to address national policy imperatives including rectifying ambiguities, inconsistencies, changing circumstances as well as legal complexities to enhance the effectiveness of the legislative framework of the PSET sector.	• Implement a Legislative Review Programme to improve the quality and responsiveness of the PSET Sector. • Roll out a Programme to strengthen governance and administration in line with legislation.	1. Higher Education Act, Act No. 101 of 1997, 2. Skills Development Act, Act No. 97 of 1998, 3. Continuing Education and Training Act, Act No.16 of 2006, 4. NSFAS Act, Act No. 56 of 1999	The MQA will provide inputs to legislative review should it be required. 60 CET Managers receiving training on curriculum related studies to improve governance in the MTDP period.
	A capable and professional public service	▪ Increase the percentage of PhD qualified staff in the higher education sector and increasing the number of lecturers appointed in universities ▪ Increase the pipeline of available scholars qualified (at	▪ Support existing permanent academics and professional staff at universities through the Staff Development Programme (USDP) to achieve doctoral degrees through full scholarships. ▪ Support universities to recruit new permanent university academics, improve staff demographic profiles, and addressing the ratio of	1. Proportion of university lecturers (permanent instruction or research staff) who hold doctoral degrees (58%) 2. 58 nGAP posts allocated to universities every year* (Cumulatively, 290 posts will be allocated to universities for the new generation of academics). *The need for qualified academics in South African universities is huge. More resources are needed to increase the number of lecturers in universities	MQA SP 2025/26-2029/30: ▪ The MQA offers bursaries for learners that wish to study towards doctoral qualification. ▪ 100 HDSA HET lecturers entering lecture development management. MQA APP targets for 2025/26: ▪ 40 bursaries for TVET lecturers in 2025/26

MTDP priority	Outcome	Outcome Focus Areas	Interventions	DHET 2029/30 end-term targets	MQA plans in contribution to MTDP
		least with a Master's degree) to apply for available vacant posts and assume roles of academics in higher education system. ▪ Improve the qualifications of TVET lecturer qualifications. ▪ Improve the qualifications of CET lecturer qualifications.	permanent to temporary staff members through the New Generation of Academics Programme (nGAP). ▪ Implement scholarships or internships at universities through the Nurturing Emerging Scholars Programme. ▪ Implement a Programme on the professionalization of TVET lecturers through a national Initiative to fund professionally unqualified lecturers to study for the Adv Dip TVT. ▪ Implement a training Programme to improve the qualifications of CET lecturers	to produce quality graduates) 3. 57 scholarships/internship positions offered through the Naturing Emerging Scholars Programme annually (Cumulatively, 285) * 4. 600 professionally unqualified TVET college lecturers acquire a Adv DipTVT qualification annually 5. 1 000 CET lecturers trained annually	financial year. However, the choice of the qualification is sorely dependent on the lecturers. ▪ 15 CET lecturers awarded skills development programme for 2025/26 financial year

The above framework serves as a vital roadmap for the MQA. By analysing these policies, the MQA gains valuable direction, identifies potential resource allocation, and fosters collaboration among stakeholders. Ultimately, this approach ensures the MMS workforce develops the necessary skills to achieve sectoral goals and navigate future challenges. The table further details the specific skills planning implications associated with each policy and strategy.

2.5. Conclusion

This chapter has underscored the critical role of skills planning in fostering a competent and adaptable workforce for the South African MMS. By analysing both key change drivers and the policy framework presented, stakeholders gain valuable insights into current and future skill needs. These policy implications highlight the need for a multi-pronged approach. On one hand, there is a crucial emphasis on equipping the workforce with future-oriented skills such as digital literacy, data analysis, and renewable energy expertise to navigate the technological advancements and the transition to a low-carbon economy. On the other hand, policies aimed at transformation and environmental sustainability necessitate addressing historical imbalances and upskilling the existing workforce in these areas. This proactive approach, informed by a comprehensive understanding of the skills landscape, allows for the development of targeted training programmes and interventions. By addressing skill gaps and equipping the workforce with the necessary capabilities, the MMS can navigate future challenges, ensure continued growth, and solidify its competitive edge.

CHAPTER 3: SECTORAL SKILLS DEMAND AND SUPPLY ANALYSIS

3.1. Introduction

This chapter primarily focuses on understanding occupational shortages, skills gaps, as well as the extent and nature of skills supply, including the sectoral priority occupations and interventions (SPOI). It draws upon various data sources, including the hard-to-fill vacancies (HTFV) section of the WSP-ATR data, DHET's Higher Education Management Information System (HEMIS) and Technical and Vocational Education and Training Management Information System (TVETMIS), MQA's APR, DMPR's GCC, and Minerals Council South Africa Certificate statistics. Additionally, the insights that are presented are informed by literature from studies conducted within the sector, previous MQA's research studies, as well as interviews and focus groups discussions with stakeholders in the sector.

3.2. Hard-to-fill Vacancies

HTFV is a metric to measure occupational shortages / demand and refer to occupations that an employer was unable to fill within 12 months (DHET, 2019). The identification of HTFVs was a systematic analytical process designed to accurately reflect occupational shortages across the entire sector. A quantitative analysis was conducted on the data derived from the WSP-ATR data to establish the most prevalent occupational shortages within the sector. The initial step involved a frequency analysis to identify the occupations most commonly cited as HTFVs. To ensure the resulting list of HTFVs was representative of the entire sector and to mitigate any potential bias from a single province, subsector, or organisation, a rigorous filtering process was subsequently applied. This process involved a cross-tabulation that required each identified occupation to meet a minimum reporting frequency across both geographical and sectoral dimensions. Specifically, an occupation was included on the final list only if it was reported as a HTFV in a minimum of five provinces and in a minimum of five distinct subsectors. This robust criterion ensured that the final list provides a holistic representation of the full scope of critical skills needs across the sector, thereby enhancing the validity and generalizability of the findings. Following the completion of this analysis, a final list of 20 occupations, as demonstrated in Table 3.1 below were identified as HTFVs.

Table 3. 1: 2025 HTFVs

Occupation Name	OFO Code	Vacancies	Main reason for hard-to-fill
Engineering Manager	2021-132104	81	Lack of relevant qualifications (desired level of study not attained or inappropriate field of study or inappropriate subject specialisation)
Mining Manager	2021-132201	113	Lack of relevant qualifications (desired level of study not attained or inappropriate field of study or inappropriate subject specialisation) and lack of relevant experience
Mineral Resources Manager	2021-132202	29	Lack of relevant experience
Geologist	2021-211401	22	Poor remuneration, lack of relevant qualifications (desired level of study not attained or inappropriate field of study or inappropriate subject specialisation) and unsuitable job location
Mechanical Engineer	2021-214401	53	Lack of relevant experience, lack of relevant qualifications (desired level of study not attained or inappropriate field of study or inappropriate subject specialisation) and poor renumeration

Occupation Name	OFO Code	Vacancies	Main reason for hard-to-fill
Mining Engineer	2021-214601	107	Lack of relevant experience
Electrical Engineer	2021-215101	70	Poor remuneration
Safety, Health, Environment and Quality (SHE&Q) Practitioner	2021-226302	67	Lack of relevant experience
Training and Development Professional	2021-242401	26	Lack of relevant experience and, lack of relevant qualifications (desired level of study not attained or inappropriate field of study or inappropriate subject specialisation)
Electronic Engineering Technician	2021-311401	29	Poor remuneration
Mining Technician	2021-311701	75	Lack of relevant qualifications (desired level of study not attained or inappropriate field of study or inappropriate subject specialisation)
Mining Production Supervisor	2021-312101	139	Lack of relevant qualifications (desired level of study not attained or inappropriate field of study or inappropriate subject specialisation)
Miner	2021-312102	87	Lack of relevant experience and lack of relevant qualifications (desired level of study not attained or inappropriate field of study or inappropriate subject specialisation)
Engineering Supervisor	2021-312103	70	Lack of relevant experience
Mine Safety Officer	2021-325705	16	Lack of relevant experience and lack of relevant qualifications (desired level of study not attained or inappropriate field of study or inappropriate subject specialisation)
Boilermaker	2021-651302	60	Lack of relevant qualifications (desired level of study not attained or inappropriate field of study or inappropriate subject specialisation), lack of relevant experience, and poor remuneration.
Diesel Mechanic	2021-653306	188	Lack of relevant experience and lack of relevant qualifications (desired level of study not attained or inappropriate field of study or inappropriate subject specialisation)
Electrician	2021-671101	34	Lack of relevant experience and poor remuneration
Millwright	2021-671202	251	Lack of relevant experience
Drill Rig Operator	2021-711301	98	Lack of relevant experience

Source: MQA WSP-ATR (31 May 2025)
****The list is presented by order of OFO major groups and not vacancies***

The above table presents hard-to-fill vacancies that are prevalent in in the MMS. These occupations are medium to high-skilled (i.e. ranging from skill level 3-4) and therefore, require education beyond matric (DHET, 2013). Employers contend that the primary reasons why these occupations are deemed hard-to-fill, is due to the lack of relevant qualifications and experience. The latter reason is of particular significance as it suggests that in all cases, while qualifications may be held by potential employees, it is more so the lack of practical know-how that renders the labour force unfit to take up these roles. This argument was corroborated by employers in interviews, adding further reasons such as remuneration, unwillingness to relocate to rural mining areas, and equity considerations, specifically for females.

Moreover, the above mentioned HTFVs were corroborated by the interview and focus group discussion findingswhich confirmed **Diesel Mechanics, Engineers (Mechanical, Electrical, Civil with postgraduate**

Geotechnology specialisation) Managers (Mining, Production, Electrical, Engineering) and Drill Operators as the occupations that are hard-to-fill. For drill operators, employers lamented the discrepancies in drilling supply and demand. The lack of a dedicated drilling school was attributted to this challenge, requiring extensive in-house training. Stakeholders emphasised the need for the MQA to consider specific training requirements and the construction of a formal school dedicated to different types of drilling. This also suggests that the drilling fraternity within the MMS needs to organise itself to advise the MQA on unit standards.

In a further attempt to triangulate these findings, the MQA administered an online survey inviting employers in the MMS to provide inputs into the HTFVs. Out of a sample of 131 respondents from the MMS' nine subsectors, 47% indicated that they had occupations that are considered hard-to-fill. These included Engineers (Chemical, Mining, Rock, Process, Reliability) 34%, Managers (Mining Manager) 11%, operators (Jumbo, TMM) 9% and Diesel Mechanics 6%. The occupations dovetail with the HTFVs reported in the 2025 WSP-ATR data.

To provide deeper insights for the current planning cycle, a retrospective analysis was conducted. This approach, which is in addition to the list of current hard-to-fill vacancies, examines the top 10 HTFVs identified over the past five years. The full details are presented in Table 3.2 below.

Table 3. 2: Hard to Fill Vacancies (2021-2025)

HTFV	2021	2022	2023	2024	2025
Diesel Mechanic	77	59	153	157	188
Engineering Manager	31	28	_	100	81
Mechanical Engineer (Mines)	15	27	31	_	53
Mine Manager	_	54	42	224	113
Mine Production Supervisor	91	42	_	245	139
Miner	_	21	34	251	87
Mining Engineer	50	47	33	18	107
Mining Technician	27	27	_	12	75
Safety, Health, Environment And Quality (SHE&Q) Practitioner	78	21	–	–	67

Source: MQA WSP-ATR (31 May 2025)

The trend analysis on HTFV from 2021 to 2025 reveals distinct patterns across various occupations. Core operational and supervisory roles, such as Mine Production Supervisor, Mine Manager, and Miner experienced the most significant and acute HTFV spikes, particularly in 2024, indicating a sudden and substantial demand for these frontline positions that largely dissipated by 2025. This implies that the challenges in these occupations are characterised by a capacity to respond to immediate needs, rather than representing a continuous, long-term issue. In contrast, technical and engineering roles such as Diesel Mechanic, Engineering Manager, and Mining Engineer demonstrate a more consistent, albeit fluctuating, presence on the HTFV list across multiple years, pointing to a chronic underlying shortage in the supply of these specialised skills. The intermittent or entirely absent record for other roles, including Goldsmith, Occupational Hygienist, Production Manager, Mine Overseer (Production), Mining Operations Manager, Rock Engineer, and Section Engineer, suggests that difficulties in filling these positions are either highly sporadic, localised, or that these roles are not consistently identified as hard-to-fill across the entire sector. This varied landscape implies that the MMS faces a dual challenge: addressing persistent structural deficits in specific technical professions while also navigating episodic, high-volume demands for critical operational personnel.

Furthermore, qualitative findings from employers corroborated these challenges, citing competitive remuneration, relevant qualifications ("GCC-ticketed engineers") and sufficient experience as key reasons why these occupations are hard-to-fill. As highlighted in the MQA's 2024 study "*Nature of Demand and Skills Supply Required with the Changing Technology in the MMS*", employers mentioned that engineers can often command higher salaries outside of the MMS. This financial disparity renders the MMS less attractive to skilled engineers, potentially leading to a talent pool shortage. To address this, mining companies may need to strategically adjust their compensation packages.

3.3. Skills Gaps

Skills gaps refer to skills inefficiencies of employees to undertake job tasks successfully required by industry standards. Skills gaps may arise due to the lack of training, new job tasks, technological changes, or new production processes. The term 'top-up skills also refers to skills gaps. Skills gaps usually require short training interventions (DHET, 2019). Table 3.3. below delves into these skills gaps arranged by order of occupational level.

Table 3. 3: Skills Gaps by Major Occupational Level

Major Occupational level	Occupation Name (Including some specialisations and alternate titles)	OFO Code	Most Common Skills Gaps
Managers	Mining Manager, Factory Manager (Mining), Quarry Manager, Mine Deputy, Plant Manager,	2021-132201	Leadership
Professionals	Occupational Safety Practitioner / Officer Health and Safety Officer / Coordinator / Professional	2021-226302	Occupational health & safety skills; Legal, governance and risk
	Human Resource Advisor, HR Administrator, Human Resources Development Coordinator	2021-242303	Technical (job-specific)
Technicians And Associate Professionals	Mining Operations Supervisor, Mining Production Supervisor, Shift Supervisor (Mining), Mine Overseer (Production), Shift Foreman/ Boss (Mining)	2021-312101	Leadership, planning and organising
	Miner, Box Controller, Team Leader (Mining), Shaft Bottom Attendant, Sinker, Rockbreaker, Ganger	2021-312102	Mine production process, leadership
	Engineering Supervisor, Fitter Foreman, Engineering Foreman, Mechanical Foreman, General Engineering Supervisor (GES)	2021-312103	Management, supervisory
	Production / Operations Supervisor (Manufacturing), Production Plant Supervisor, Shift Manager (Production), Beneficiation Plant Foreman	2021-312201	Supervisory, leadership, legal, governance and risk
Clerical Support Workers	Administrative Assistant, Recording Clerk, Administration Clerk / Officer, Office / Field Assistant Community Services Clerk,	2021-411101	Computer Literacy, office administration

Major Occupational level	Occupation Name (Including some specialisations and alternate titles)	OFO Code	Most Common Skills Gaps
	Administrative Assistant		
	Administrator, Strategic Support Officer, Course Coordinator, Project Programme Specialist	2021-441903	Computer literacy
Craft & Related Trades Workers (Artisans)	Boiler Maker, Boilermaker-welder, Plater-boilermaker, Boilermaker	2021-651302	Technical (Job Specific)
	Diesel Mechanic, Diesel Injector, Diesel Fuel Injection Mechanic, Diesel Fitter-mechanic	2021-653306	
	Electrician (Engineering), Electrician, Medium Voltage Switchgear Electrician, High Voltage Switchgear Electrician	2021-671101	
Plant and Machine Operators and Assemblers	Mineral Processing Plant Operator, Plant Monitor Mineral Plant Operator Milling Plant Operator Machine Operator (Stone Cutting or Processing), Senior Process Operator Mineral Plant Operator Plant Monitor Plant Operator Process Operator	2021-711201	Technical (job-specific), mine production process

Source: MQA WSP-ATR (31 May 2025)

As seen in table 3.2 above, Mine Manager and Diesel Mechanic occupations are consistently hard to fill. These roles have also been identified as having ongoing skill gaps. Over the past five years, Mine Manager vacancies have appeared four times (2022/23, 2023/24, 2024/25, 2025/26), while Diesel Mechanic vacancies appeared five times (2021/22, 2022/23, 2023/24, 2024/25 and 2025/26). This consistent high demand emphasises the importance of prioritising these occupations for targeted interventions in the current planning cycle.

Looking beyond historical data, a crucial takeaway from the skills gap analysis is twofold. First, stakeholders see a strong emphasis on soft skills such as leadership, as well as planning and organising skills as essential for employees across most major occupational groups. According to MMS stakeholders, there is also a critical need for interpersonal, personal mastery, and resilience skills. The need for better people management, communication, and personal resilience was cited as critical across all employment levels. To address these identified skills gaps, the MQA in 2025 supports the provision of short courses. Lastly, there is a concerning trend of skill gaps in technical ability reported for all artisan roles. This highlights the urgent need for the MQA to continue the intensification and strengthening of upskilling and reskilling efforts for artisans.

3.4. Emerging Occupations in the MMS

The MMS is no stranger to change. While core roles remain essential, the sector is embracing digitisation, national sustainability strategies, and evolving global demands. This confluence of factors has fostered a wave of emerging occupations requiring new skillsets. This section delves into these exciting new roles, exploring how they address the changing landscape of mining. These are graphically summarised in table 3.4. below and are further detailed in the sections that follow.

Factor	Emerging Occupation	OFO Code	Vacancies	Rationale
4IR	Data Analyst	-	-	Data management identified as being key for organisations to make informed and data-driven decisions, underscoring the demand for individuals in data and/or systems related roles.
	Information Systems Specialist	-	-	
	Application Developer	-	-	
Green Hydrogen Technologies	Gas Engineer	2021-214607	-	Production, Storage, Distribution and Transportation; Heating, Power generation, Transport, and Industrial processing (oil refineries, steel, and iron production and chemical production).
	Cavern Engineer	-	-	Storage
	Locomotive (train) Engineer	-	-	Transport
	Refuelling Station Engineer	-	-	
	Electrolysis Engineer	-	-	Production, Storage and Power Generation.
	Electrochemical Engineer	-	-	Production, Storage, Distribution and Transportation. Transport.
	Marine Engineering Technician	2021-311501	-	Distribution and Transportation. Industrial processing (oil refineries, steel, and iron production and chemical production)
	Reservoir Technologist	-	-	Storage.
	Electrolyser Technician	-	-	Production.
	System Integration Technician	-	-	Production, Storage, Distribution and Transportation. Heating, Power generation, Transport, and Industrial processing (oil refineries, steel, and iron production and chemical production).

Table 3. 4: Emerging MMS Occupations

Source: Identification of the Skills Needed for the Hydrogen Economy, DHET (2024); MQA 4IR Impact on Skills Demand and Supply Research (2024)

The emerging occupations as a result of 4IR are a result of technological changes being instituted in the MMS in line with the increasing adoption of autonomous technologies to replace many of the manual operations. This need stems from the increased challenges that mining operations continue to face due to the vast amounts of data generated daily, necessitating strategies to manage this data effectively. Qualitative data supports this, with many employers noting a growing demand for data analysts and systems specialists. Due to their nascent nature, these occupations do not currently have OFO codes and vacancy numbers.

The MQA has introduced interventions that are specifically designed to facilitate the provision of skills related to 4IR. For example, the MQA has introduced an elementary digital skills programme that commenced in the 2025/26 financial year under the AET intervention. Notwithstanding this, the MQA

will be incorporating a mining stream with the Umalusi GETC which will include a module on digital literacy. Moreover, the MQA has a 4IR intervention for non-artisan training, with 150 students trained on 4IR learnerships during the 2024/25 financial year. The 4IR learnerships are a collaboration with MICT SETA.

Furthermore, green hydrogen presents a transformative opportunity for the MMS (as discussed in Chapter 2). These roles focus heavily on engineering and technical expertise, suggesting a significant shift in the skillset required for the future MMS workforce. This sentiment was echoed by employers in the stakeholder interviews arguing that 'Green Energy and Hydrogen Specialists' are emerging areas requiring new skills.

The MQA conducted a study on the nature of green hydrogen technologies in the MMS which presented a number of critical insights (MQA, 2024). It was found that understanding hydrogen properties (46,7% of respondents) is the most important skill at risk of shortage, followed by calibrating, testing, and maintaining of equipment (37,8%). Knowledge of power electronics was also seen as an important skill (35,6%). MMS stakeholders also identified material science (55,6%), renewable energy systems (53,3%), electromechanical engineering (42,2%), energy storage and grid (37,8%) as well as process control and automation (33,3%) as critical fields for the hydrogen economy in the MMS. The study also found that business skills will be important and unless developed, they are also at risk of shortages in the future. This presents the MQA with opportunities to address these challenges proactively through entrepreneurship training which is specific to the green hydrogen economy. According to the study, financial analysis (51%) and economics (44%) will be the highest business skills sought after as green hydrogen gains traction in the MMS.

While no immediate skills gap exists, the sector faces a looming risk due to underdeveloped academic and artisan training programmes that are not yet aligned with the technological and workplace demands of green hydrogen. These findings call for proactive strategies to raising awareness, developing appropriate policies, investing in infrastructure, and aligning skills development with the sector's anticipated growth. The MQA's eagerness to participate in and partner with cross-sectoral fora on the just energy transition such as the Presidential Climate Commission and the JET Skills Desk (as will be tabled in Chapter 4 below) is a response to this call.

Key Skills Implications:

- Strong foundation in core engineering principles remains crucial, especially for adapting existing roles such as locomotive engineer to operate hydrogen-powered technologies.
- In-depth knowledge of electrolysis technology and its applications in mining contexts will be essential for electrolysis engineers and electrolyser technicians.
- Understanding how to integrate green hydrogen systems with existing mining operations will be paramount for system integration technicians.
- Depending on the specific application, some roles (e.g., reservoir technologist) may require expertise in areas such as hydrogen storage within the geological context relevant to mining.
- Upskilling and reskilling opportunities will be crucial for existing mms workforce to adapt to the demands of green hydrogen technologies (e.g., traditional mechanics learning to maintain hydrogen-powered mining vehicles).

To address the skills gap for the new green hydrogen occupations, the MQA has collaborated with three entities, i.e., CHIETA, TETA and the CSIR, in the development of the green hydrogen centre of specialisation. Universities and TVET college are envisaged to host these centres including programme

(skills
programmes, part and full qualifications) development, delivery, assessment, certification and engagement with potential employers for absorption of the trained cohorts.

Having conducted a thorough analysis of occupational shortages and skills gaps within the MMS, it is now pertinent to report on the existing skills supply and its alignment with the sector's skills development initiatives. This critical assessment forms the basis of the following section, which reflects on the adequacy of the current skills supply in meeting the evolving needs of the MMS.

3.5. Supply-side Analysis

The potential growth and sustainability of the MMS hinges on its ability to cultivate a highly competent workforce. In recognition of this critical factor, an assessment of the skills supply is paramount. This assessment will determine the efficacy of current skill sets in meeting the evolving demands of the sector.

The prominent entities responsible for facilitating the supply of skills in the MMS are the Department of Basic Education (DBE), the DHET, mining companies, and the MQA. The DBE facilitates a pathway for eligible learners to enrol in mining-related programmes, specifically targeting matriculants with STEM backgrounds. The DHET produces mining graduates equipped to enter the labour market within the MMS. Mining companies promote the enhancement of skills among current employees and local mining communities. At the intersection of these actors lies the MQA, mandated to facilitate skills development within the MMS. Each stakeholder plays a distinct and vital role within various stages of the skills supply process. Furthermore, their collaborative efforts are mutually reliant upon one another to effectively address the sector's ever-changing skills requirements. The subsequent section delves into a detailed examination of the types and extent of skill provision undertaken by these entities. This analysis will place a particular emphasis on the enrolment and throughput rates within this co-dependent supply pipeline. Following this, the next section will proceed to consider a number of critical challenges currently faced on the supply side, including those reported by employers within the sector. In conclusion, the section will culminate with a presentation of the interventions planned by the MQA to address the supply-side hurdles, ultimately aiming to ensure a robust and future-proof workforce for the MMS.

3.5.1. Basic Education

Basic education offers foundational knowledge in subjects such as languages, mathematics, and sciences (South African Government 2024 & DBE, 2021). Secondary education provides a more specialised curriculum building upon primary education. Success in STEM subjects (science, technology, engineering, and mathematics) during the matriculation year serves as a crucial indicator for pursuing careers within the MMS. The national pass rate for the class of 2024 reflects continued positive progress, reaching 87,3%. This marks a 4,4% increase compared to the 82,9% achieved in 2023. This improvement is commendable considering the adverse circumstances that have faced this cohort since the beginning of their secondary school journey. The class of 2024 began Grade 8 at the inception of COVID-19 in 2020 when teaching and learning was greatly disrupted (DBE, 2025).

In what follows in table 3.5. below, we illustrate the improvements in subject performance with particular interest in MMS-related subjects which are mathematics, physical science, and geography.

Table 3. 5: Comparison of Performance in MMS-Related Subjects 2020-2024

Subject Description	2020	2021	2022	2023	2024	% Difference
Accounting	75,5%	74,7%	75,4%	76,8%	81,2%	7,6%
Agricultural Sciences	72,7%	75,4%	75,8%	80,5%	86,9%	19,6%
Business Studies	77,9%	80,5%	76,7%	81,8%	86,0%	10,4%
Economics	68,8%	67,9%	71,5%	74,5%	80,5%	17,0%
Geography	**75,3%**	**74,3%**	**81,3%**	**86,2%**	**89,5%**	**18,9%**
History	92,1%	89,5%	88,2%	87,7%	90,3%	-1,9%
Life Sciences	71,0%	71,5%	71,5%	75,6%	80,8%	13,8%
Mathematical Literacy	80,8%	74,5%	85,7%	82,3%	86,1%	6,6%
Mathematics	**53,8%**	**57,6%**	**55,0%**	**63,5%**	**69,1%**	**28,4%**
Physical Sciences	**65,8%**	**69,0%**	**74,6%**	**76,2%**	**75,6%**	**14,9%**

Source: DBE (2025)

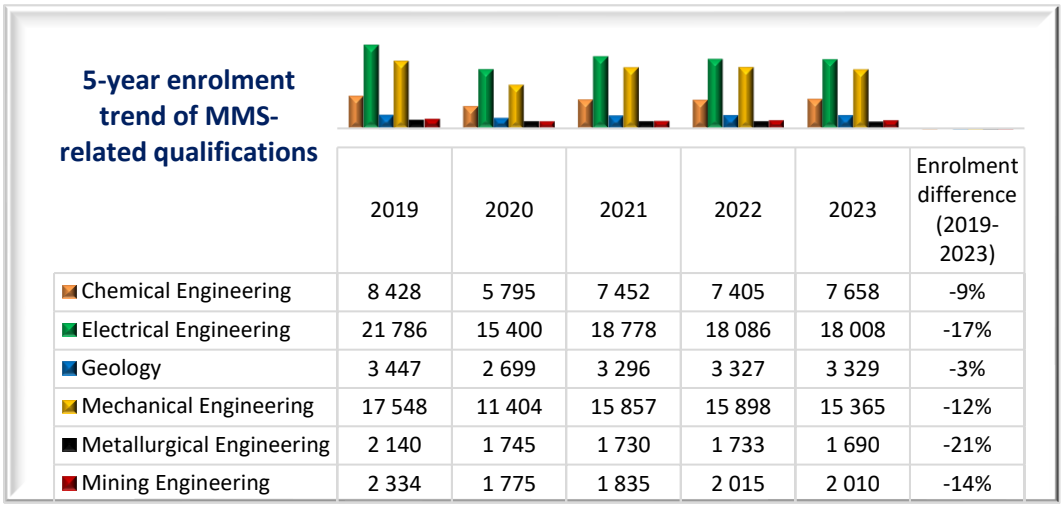
Table 3.5. above highlights trends in gateway subject performance (2020-2024) with significant implications for skills development in the MMS. In 2024, 69,1% of learners achieved a pass in Mathematics, reflecting an improvement from the 63,5% pass rate recorded in 2023. In contrast, the pass rate for Physical Sciences declined slightly to 75,6% in 2024, compared to 76,2% in the previous year (DBE, 2025). The progress observed in Mathematics outcomes is a positive development. In order to positively influence these trends, MMS stakeholder interviews advised the MQA to carefully engage with the DBE in order to see how, without encroaching on their mandate, it can support the DBE in enhancing foundation phase teachers' soft and technical skills when it comes to teaching STEMI subjects. This initiative can also include infrastructure support particularly for marginalised teachers in rural areas.

The next section reflects on higher education as a critical role players of skills supply in the MMS.

3.5.2. Higher Education

Tertiary education, often known as higher education and training, (HET), encompasses education leading to undergraduate and graduate degrees in addition to certifications and diplomas. Although more learners are passing matric with grades suitable for university enrolment, the uptake of mining-related certifications is still very low. A five-year trend in the number of graduates enrolling in and completing degrees linked to core mining is presented in Figures 3.1. and 3.2. below. The data presented on university and TVET enrolment and graduation statistics reflects the most recent information available from the DHET.

3.5.3.1. Universities' Programme Offerings



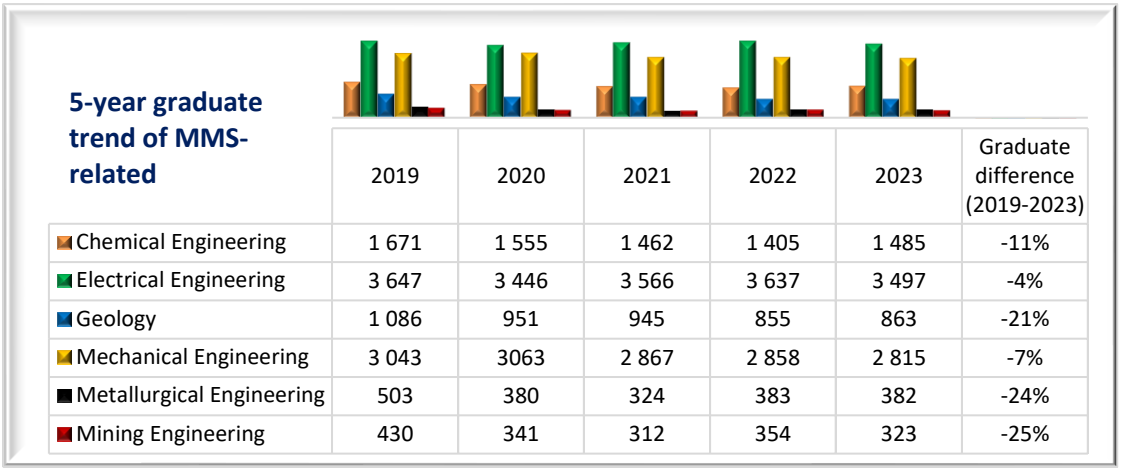
	2019	2020	2021	2022	2023	Enrolment difference (2019-2023)
Chemical Engineering	8 428	5 795	7 452	7 405	7 658	-9%
Electrical Engineering	21 786	15 400	18 778	18 086	18 008	-17%
Geology	3 447	2 699	3 296	3 327	3 329	-3%
Mechanical Engineering	17 548	11 404	15 857	15 898	15 365	-12%
Metallurgical Engineering	2 140	1 745	1 730	1 733	1 690	-21%
Mining Engineering	2 334	1 775	1 835	2 015	2 010	-14%

Figure 3. 1: Enrolment Trends of MMS Related Qualifications (5 years)
Source: DHET, HEMIS Data (2019-2025)
**** The statistics provided above are derived from the latest publicly accessible data from DHET***

Figure 3.1 depicts the 5-year enrolment trends for MMS-related qualifications offered by universities. Despite improvements in gateway subject performance at secondary education suggesting a stronger foundation for STEM careers, the data reveal a concerning overall decline in the pipeline of future talent. All listed engineering disciplines experienced a net decrease in enrolments between 2019 and 2023. metallurgical engineering saw the most substantial drop at -21%, followed by electrical engineering (-17%), mining engineering (-14%), and mechanical engineering (-12%). Chemical engineering (-9%) and geology (-3%) experienced comparatively smaller declines. This sustained downward pressure on enrolments, particularly in core mining and metallurgical fields, directly implies a future shortage of qualified professionals to meet the MMS's evolving and often complex skills demands.

Interviews and focus group discussions with education and training experts revealed three key reasons for the declining student enrolments in mining-related qualifications. Young people see mining as "dirty, physical, underground" work and choose seemingly more glamorous fields. Universities that offer mining-related qualifications are concentrated in urban centres, deterring rural students who face housing, funding, and strict entry requirements. Volatile commodity cycles, retrenchments and automation fears push students away and drive graduates to other fields (e.g., finance). This results in the disillusionment of potential graduates.

Figure 3.2. below augments this picture, delving into the graduation trends over a five-year period.



5-year graduate trend of MMS-related	2019	2020	2021	2022	2023	Graduate difference (2019-2023)
Chemical Engineering	1 671	1 555	1 462	1 405	1 485	-11%
Electrical Engineering	3 647	3 446	3 566	3 637	3 497	-4%
Geology	1 086	951	945	855	863	-21%
Mechanical Engineering	3 043	3063	2 867	2 858	2 815	-7%
Metallurgical Engineering	503	380	324	383	382	-24%
Mining Engineering	430	341	312	354	323	-25%

Figure 3. 2: Graduation Trends of MMS Related Qualifications (5 years)

Source: DHET, HEMIS Data (2019-2025)

**** The statistics provided above are derived from the latest publicly accessible data from DHET***

The 5-year graduate trends reveal a concerning decline in the number of graduates, mirroring the trends seen in enrolments. All listed disciplines experienced a decrease in graduates over the period. Mining Engineering saw the most significant drop in graduates at -25%, closely followed by Metallurgical Engineering (-24%) and Geology (-21%). Chemical Engineering (-11%), Mechanical Engineering (-7%), and Electrical Engineering (-4%) also experienced declines, albeit less steep. While there were minor fluctuations year-on-year, the overall trajectory for graduates in these critical fields is downward, with 2023 graduate numbers generally below their 2019 levels. The combined effect of declining enrolments and graduates directly impacts the supply of new, qualified professionals entering the MMS. This exacerbates existing occupational shortages and makes it harder for mining companies to fill hard-to-fill vacancies, particularly in specialised engineering and geological roles.

In an attempt to understand this issue, stakeholder interviews with academics in the MMS revealed two key themes which they argue are the drivers of this challenge: (a) graduation and throughput challenges (b) diminishing industry engagement and support. Many students take longer to graduate or drop out due to socioeconomic challenges such as unsafe housing, food insecurity, lack of data leading some to switch qualifications over poor job prospects or tough competition from related fields (e.g. chemical engineering students opt for metallurgy jobs). COVID-19's shift back to closed-book exams also impacted completion rates, with students having to recalibrate their study techniques. Reduced collaboration between higher education and mining companies limits internships and practical experience. Unlike in the past, full scholarships with job guarantees are rare; sector downturns drive employers to cut investment in new talent and community skills programmes, further shrinking the MMS graduate pipeline.

In this planning cycle, it is opportune for the MQA to enhance psycho-social support beyond financial assistance for mining-related qualifications. This can be achieved through mentorship programmes for students nearing graduation, career guidance for those leaving secondary school, and an examination of alternative entry points into the MMS. By implementing these multifaceted strategies, the gap between available funding and student enrolment can be bridged, attracting a wider pool of talent to the sector.

3.5.3.2. TVET Programme Offerings

The table below illustrates the enrolment rates for TVET qualifications between 2020 to 2023.

Table 3. 6: TVET Enrolment Rates 2020-2023

Year	Qualification Category						
	NC(V)	Report 191 (N1-N6)	Occupational Qualifications	Other/skills programmes	PLP	Level 5 and Level 6 Qualifications	Total
2020	146 637	274 907	20 130	3 888	5 250	1 465	**452 277**
2021	141 768	416 949	18 277	6 653	4 581	855	**589 083**
2022	135 727	356 575	15 837	4 505	4 420	1 520	**518 584**
2023	134 005	402 653	15 474	6 997	4 323	637	**566 112**

Source: Statistics on Post-School Education and Training, DHET, (2025)

**** The statistics provided above are derived from the latest publicly accessible data from DHET***

In line with the latest available statistics from the DHET, between 2020 and 2022, enrolments in TVET experienced a post-COVID recovery with enrolment increasing by a considerable 136 806 students across the various programmes. Although enrolments rebounded to 589 083 in 2021, further declines were observed in 2022 (518 584). However, TVET enrolments grew from 518 584 in 2022 to 566 112 in 2023, mainly due to a +46 000 increase in Report 191 enrolments and a doubling in Other/skills programmes. NC(V), Occupational Qualifications (down from 15 837 to 15 474), and Level 5–6 qualifications fell, raising concerns over future workforce readiness. These have a number of implications for the MMS. For example, Report 191 remains dominant but fluctuates, risking misalignment with modernisation and automation needs. The NC(V) decline may create gaps in foundational skills for entry-level roles. Growth in Other/skills programmes offers scope for agile, targeted MMS training partnerships. The Level 5–6 drop raises concerns as it reduces the supply of specialised, high-level technical skills needed for advanced operations and technology adoption.

Table 3.7. which follows below delves into NC(V) throughput rates for the 2020-2022 cohort.

Table 3. 7: NC(V) Throughput Rates by Programme 2020-2022 Cohort

	PROGRAMME TYPE	NUMBER ENROLLED (NC(V)2, 2020)	NUMBER COMPLETED (NC(V)4, 2022)	THROUGHPUT RATE (%)
1	Drawing Office Practice	94	–	–
2	Electrical Infrastructure and Construction	8 189	265	3.2%
3	Information Technology and Computer Science	3 875	200	5.2%
4	Process Plant Operations	225	12	5.3%
5	Civil Engineering and Building Construction	4 952	304	6.1%
6	Engineering and Related Design	8 662	566	6.5%
7	Mechatronics	463	35	7.6%
8	Marketing	2 431	215	8.8%
9	Safety in Society	1 990	203	10.2%
10	Finance, Economics and Accounting	3 606	382	10.6%
11	Hospitality	3 837	428	11.2%
12	Management	2 974	373	12.5%
13	Primary Agriculture	1 821	244	13.4%
14	Transport and Logistics	1 988	310	15.6%
15	Tourism	4 242	692	16.3%
16	Office Administration	11 913	2 290	19.2%
17	Education and Development	1 600	381	23.8%
18	Primary Health	384	101	26.3%
Total		63 246	7 001	11.1

Source: Fact Sheet: Throughput Rate Of TVET College NC(V) (National Certificate Vocational) Students (2024)

The NC(V) throughput rates reveal a critical challenge in student completion, with an alarmingly low overall average throughput rate of 11,1%, indicating that only a small fraction of students successfully complete their programmes. This issue is particularly pronounced in fields highly relevant to the MMS, such as Electrical Infrastructure and Construction (3,2%), Information Technology and Computer Science (5,2%), and Process Plant Operations (5,3%), which exhibit some of the lowest completion rates. When viewed alongside the previously noted steady decline in NC(V) enrolments from 2020 to 2023, this abysmal throughput rate compounds the challenge, signifying a severe constriction in the pipeline of NC(V) qualified individuals. Not only are fewer students choosing these foundational vocational qualifications, but a very small percentage of those who do enrol are actually completing them, directly translating to a significant and growing deficit in the supply of individuals with essential foundational vocational skills for the MMS, thereby exacerbating the sector's skills gaps and making it harder to fill entry-level and technical support roles. Addressing this requires not only attracting more students but, more critically, improving student support, retention, and academic success within these programmes.

3.5.3. Industry Skills Supply

Beyond educational institutions, the industry itself (employers) significantly shape the MMS skills pipeline. The sections below detail the skills supply provided by the industry, including by mining

companies, the DMPR and Minerals Council South Africa.

3.5.4.1. Mining Companies

The figure below highlights the top two bursaries supported by mining companies in the 2024-2025 financial year.

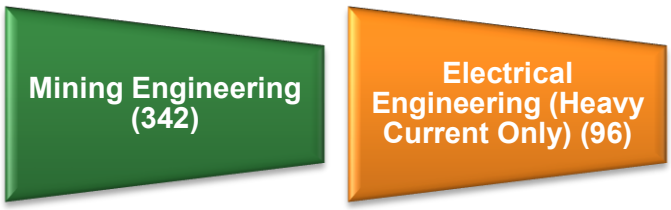


Figure 3. 3: Top 2 MMS Employee Bursaries (2024-2025)
Source: MQA WSP-ATR (31 May 2025)

Mining Engineering is consistently the most supported bursary type, with a total of 342 bursaries offered across 2021-2025, followed by Electrical Engineering (Heavy Current Only) with a total of 96 bursaries. In recent engagements with the MQA Learning Programmes Unit offering support to MMS bursars, it was stated that Mining Engineering beneficiaries are being poached out of the MMS and into the ICT sector. To bridge this gap, a multi-pronged approach is recommended. Highlighting advancements in safety, sustainability practices, and technological integration can foster a more positive perception amongst beneficiaries.

In addition to the skills supply provided by mining companies, the DMPR and Minerals Council South Africa (two of MQA's key role players) play an imperative role in the supply of skills in the MMS. Their contributions are presented in the sections that follow.

3.5.4.2. Minerals Council South Africa Issued Certificates

The introduction of the Minerals Council Chamber of Mines Certificates (CoC) aimed to standardise standalone in-house certifications for individuals employed within the South African MMS. All exams for disciplines such as Survey, Sampling, Ventilation, and Rock Mechanics are coordinated and overseen by the Minerals Council, which also handle the issuance of certifications. These qualifications empower candidates to execute their roles with heightened confidence and comprehension, facilitating their progression to senior positions. Candidates are required to undergo training in designated subjects and fulfil specified hours before being eligible to sit for examinations leading to the Minerals Council Certificates. In Table 3.8 below, an analysis of the trends that have characterised the issuance of these certificates from 2019 to 2024 are presented.

Table 3. 8: Minerals Council South Africa Certification (2019-2024)

Certificate	2019	2020	2021	2022	2023	2024
Certificate in Advanced Mine Surveying	21	14	20	20	28	**39**
Certificate in Advanced Mine Valuation	15	08	11	15	17	**17**
Certificate in Advanced Rock Engineering	3	2	2	3	2	**3**
Certificate in Basic Mine Sampling	75	30	58	73	84	**72**
Certificate in Basic Mine Surveying	**78**	**31**	**73**	**72**	**117**	**114**
Certificate in Elementary Mine Sampling	36	10	10	23	22	**30**

Certificate	2019	2020	2021	2022	2023	2024
Certificate in Elementary Mine Surveying	43	25	25	44	12	**40**
Certificate in Mine Environmental Control	81	31	41	31	14	**10**
Certificate in Radiation Protection Monitoring Screening	58	72	85	75	113	**23**
Certificate in Rock Mechanics	14	11	17	14	11	**17**
Certificate in Strata Control	42	23	44	63	51	**52**
Intermediate Certificate in Mine Environmental Control	88	58	77	100	72	**66**
Certificate in Mine Survey Draughting	6	06	04	13	18	**17**
Total	**560**	**321**	**467**	**546**	**561**	**500**

Source: Minerals Council South Africa (2025)

The Minerals Council certifications data (2019-2024) indicates a fluctuating demand for certifications. Data reveals that the certificate with the highest issuance (pass-rate) across the five-year period was Basic Mine Surveying, while the certificate with lowest issuance in the same period was Advanced Rock Engineering. Engagements with the Minerals Council revealed that one of the reasons why the pass rate is higher for Basic Mine surveying is that its content is rudimentary in nature, and it is easy to pass by virtue of this. The opposite is true for Advanced Rock Engineering, which is harder to pass due to its focus on advanced mathematics and engineering methods and a considerably difficult examination. As illustrated above, this means the more advanced the certificate, the less it is passed across the certificates. These factors are exacerbated by on the one hand, the lack of industry exposure for newly appointed workers fresh from graduation, as well as the experiential knowledge of older employees not meeting the curriculum demands of these examinations. A potential skills gap emerges with the general decline in advanced certifications. In the short to medium term, the MQA has initiated a study that looks into the state of certificates of competency in the MMS. The findings from this study will yield more insights into the roots of the above dynamics, including the kind of support that these incumbents need in order to prosper in examinations. From these findings, data-driven, joint initiatives between the MQA and the Minerals Council can be formulated to ensure that these trends are disrupted.

The next section discusses the DMPR Government Certificates of Competency.

3.5.4.3. Government Certificates of Competency

Certain core occupations in the MMS, such as mine engineer and mine manager can only operate upon attainment of a GCC issued by the DMPR, which confirms that the employee has the necessary skill set required to perform the job. There is a stringent qualification criterion, which include years of experience and passing examinations to qualify for a GCC. The following table presents the data on the number of collective certificates issued by the DMPR between 2019-2023.

Table 3. 9: Awarded GCCs (2019-2023)

Year	Mine Engineer (Elec & Mech)			Mine Manager (Coal & Metal)			Mine Overseer (Coal & Metal)			Mine Surveyor			Winding Engine Driver			Total number of certificates issued
	M	F	**Total**	M	F	**Total**	M	F	**Total**	M	F	**Total**	M	F	**Total**	
April 2019 -March 2020	56	9	**65**	81	32	**113**	69	13	**82**	5	0	**5**	9	9	**18**	**283**

Year	Mine Engineer (Elec & Mech)			Mine Manager (Coal & Metal)			Mine Overseer (Coal & Metal)			Mine Surveyor			Winding Engine Driver			Total number of certificates issued
	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	
April 2020-March 2021	26	5	**31**	10	4	**14**	40	12	**52**	5	0	**5**	0	0	**0**	**102**
April 2021 -March 2022	39	10	**49**	49	20	**69**	76	15	**91**	7	3	**10**	0	0	**0**	**219**
April 2022 -March 2023	25	5	**30**	39	19	**58**	68	23	**91**	9	0	**9**	5	5	**10**	**198**
April 2023 -March 2024	103	23	**126**	48	17	**65**	86	21	**107**	4	0	**4**	17	16	**33**	**335**

**M = Males *F = Females*

The analysis of the uptake of GCCs over the past five years (2019-2023) reveals a complex picture influenced by the COVID-19 pandemic, institutional challenges within the DMPR, and varying industry demand for specific skills. The onset of the pandemic in 2020 led to a significant decline in GCC uptake across all categories, particularly impacting roles such as Mine Manager, Mine Engineer, and Mine Overseer. This decrease was exacerbated by the absence of a Board at the DMPR responsible for overseeing learner competency, further hindering progress in areas such as the Winding Engine Driver certification.

However, the easing of COVID-19 restrictions in 2022 and efforts to clear backlogs led to a noticeable recovery in GCC uptake. Despite this positive trend, certain challenges persist. The Mine Surveyor certificate, for instance, consistently sees the lowest uptake, particularly among women. This is attributed to the low demand for this role within the sector, as one Mine Surveyor can often serve multiple companies. The traditionally male-dominated nature of this occupation further contributes to the low participation of women.

Of particular concern is the fluctuating and overall declining trend in the pass rates of Mine Manager certificates. This is especially worrying considering the persistent identification of this role as a hard-to-fill in recent years. The primary reason cited for this difficulty is the lack of experience, suggesting a reluctance among employers to sponsor individuals for this demanding certification. The gap between theoretical knowledge acquired through education and the practical know-how required for effective management in the MMS remains a significant challenge in filling this crucial role.

Collaboration between the MQA and the DMPR remains crucial for the successful implementation of measures aimed at enhancing the uptake and pass rate of GCC candidates in the examination. In this planning cycle, this includes the intensification of internships, candidacy programmes and the support of women to mitigate the scourge of gender stereotyping in the uptake and pass rates of GCCs.

3.5.4. SETA Skills Supply in the MMS

The skills supply of the MQA can be categorised into three main components. Firstly, the MQA focuses on providing skills at the educational level, ensuring that individuals receive the necessary training and

knowledge to enter the workforce. Secondly, the MQA offers skills support for novice employees, assisting them in their transition from education to employment and helping them develop the required skills for their respective roles. Lastly, the MQA also emphasises ongoing skills support for existing employees, recognising the importance of continuous learning and professional development to enhance their performance and adapt to evolving industry demands. Chapter 5 details these interventions through a five-year trend analysis.

3.5.5. An Overview of Supply-Side Challenges

The future of the South African MMS hinges on its ability to develop and maintain a skilled workforce. However, a closer look at various data points reveals a complex landscape with significant challenges regarding skills supply. These challenges are related to foundational education and access inequities, perceptions of the MMS and career attractiveness, declining enrolment and graduation, graduate absorption, weakening industry–education linkages and limited work experience. These are depicted below.

1. Foundational Education and Access Inequities

While overall Matric pass rates are high, significant disparities remain, with provinces such Mpumalanga and Eastern Cape consistently underperforming. Low throughput rates in key TVET programmes (e.g., only 3.2% for Electrical Infrastructure and Construction) limit the availability of technically skilled graduates. Access to MMS careers is hindered by unequal distribution of institutions, entry requirements, and inadequate access for rural learners.

2. Negative Perceptions of the Sector

The MMS is perceived as physically demanding, unsafe, and low in prestige, deterring young people who favour "cleaner" or digital careers. Students favour fields viewed as modern or prestigious, especially amidst concerns about job security and sector volatility. The cyclical nature of mining, retrenchments, and lack of guaranteed employment post-graduation fuel disillusionment.

3. Weak Industry–Education Linkages and Limited Work Experience

Collaboration between mining companies and institutions of higher learning is diminishing, reducing internship and experiential learning opportunities. Graduates now face longer transitions into work, with fewer structured placements or mentorships.

4. Declining Enrolment, Graduation, and Graduate Absorption

Despite improvements in mathematics performance at basic education level, enrolment and graduation rates in MMS-related qualifications are falling, especially in fields such as mining and metallurgical engineering. Factors include socioeconomic hardships, academic exclusion, and increased competition from broader disciplines (e.g., chemical engineering taking metallurgical roles). Employers sponsor students, but rarely guarantee employment, leading to disillusionment and talent poaching by other sectors such as finance.

Skills implications of industry skills supply

- The MMS requires a **two-pronged approach** to skills development, i.e., attracting new talent with relevant skillsets and upskilling the existing workforce.
- A **collaborative effort** between industry, educational institutions, and the MQA is crucial. Industry can provide insights into skill gaps, educational institutions can develop targeted programmes, and the MQA can ensure proper accreditation.
- The changing landscape necessitates a **data-driven and adaptable** approach to skills development. Regularly monitor trends in bursaries, certifications, university/TVET enrolments, and technological advancements to ensure programmes remain relevant to the sector's current and future needs.
- **Sustainability** is no longer an afterthought. It is a critical skillset that needs to be integrated into the mining workforce development strategy.

3.6. SPOI List

3.6.1. Methods Followed in Compiling the SPOI List

The Sectoral Priority Occupations and Interventions List (SPOI), previously known as the PIVOTAL list, serves as a critical tool for ensuring the MMS has a skilled and competent workforce. Below is a breakdown of how the SPOI list was developed. As illustrated in figure 3.4 below, the process involved a multi-stage approach ranging from the analysis of quantitative and qualitative data, internal and external validatory processes:

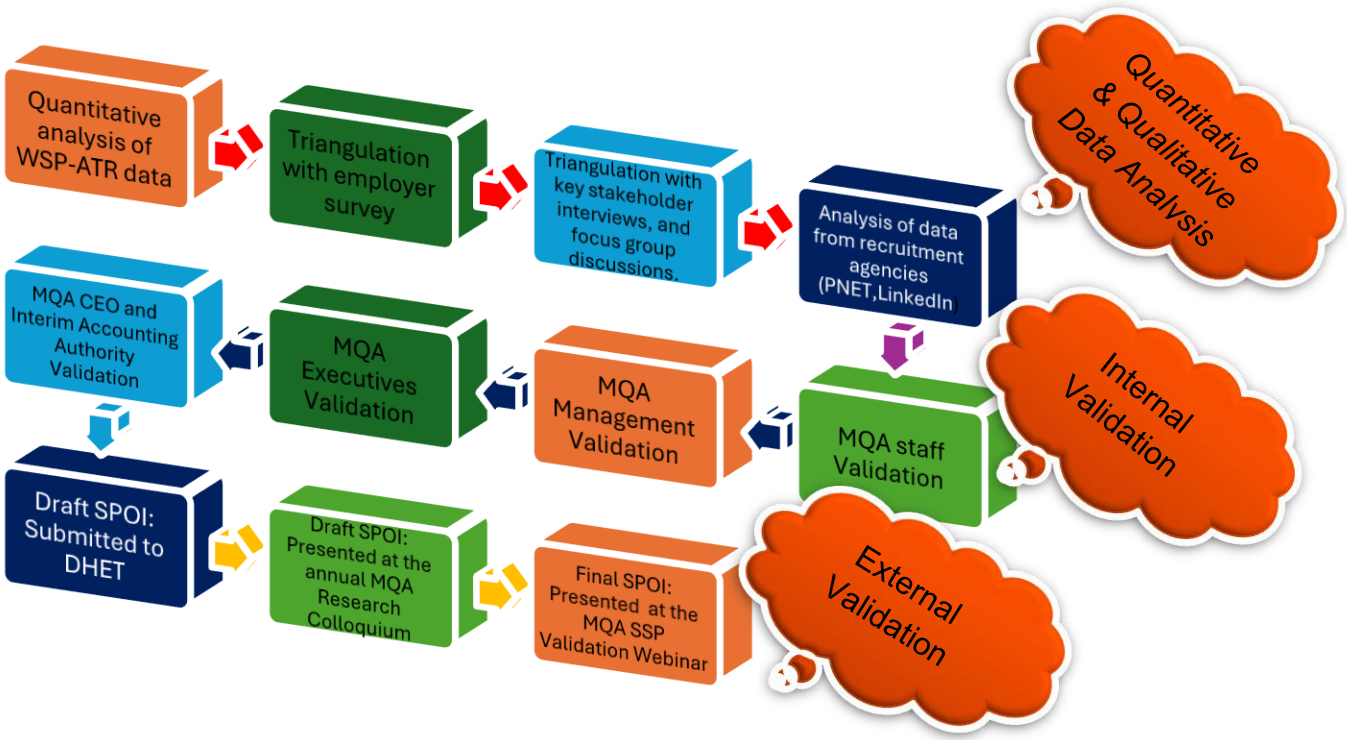


Figure 3. 4: Methods Followed in Compiling the SPOI List

By incorporating the above methodology, the SPOI list benefits from:

- **Triangulation of data:** Multiple data sources (interviews, research, industry analysis) provide a more comprehensive overview of skills needs, reducing the risk of bias or relying solely on anecdotal evidence.
- **Enhanced credibility:** Stakeholder involvement fosters a sense of ownership and buy-in, making the SPOI more credible and reliable for both industry and educational institutions.
- **Proactive skills development:** The inclusion of national development priorities and consideration of future trends helps ensure the SPOI remains relevant and addresses the evolving skill needs of the mining and minerals sector.

Table 3.10. below presents the top 10 SPOI in the MMS taking into account the above-mentioned methodology. The list is presented by order of major OFO and not vacancies.

Table 3. 10: MQA's OFO Code Based Sectoral Priority Occupations and Interventions List

Occupation name	OFO code	Intervention Planned	NQF Level	NQF Aligned (Y/N)	Quantity Required	Quantity to be Supported
Engineering Manager	2021-132104	Candidacy	N/A	No	81	81
		Internships	N/A	No		
		Bursary	6-10	Yes		
Mining Manager	2021-132201	Candidacy	N/A	No	113	113
		Internships	N/A	No		
		Bursary	6-10	Yes		
Mineral Resources Manager	2021-132202	Candidacy	N/A	No	29	29
		Internships	N/A	No		
		Bursary	6-10	Yes		
Mining Engineer	2021-214601	Candidacy	N/A	No	107	107
		Internships	N/A	No		
		Bursary	6-10	Yes		
Safety, Health, Environment and Quality (SHE&Q) Practitioner	2021-226302	Candidacy	N/A	No	67	67
		Internships	N/A	No		
		Bursary	6-10	Yes		
		Work Experience	N/A	No		
Mining Technician	2021-311701	Candidacy	N/A	No	75	75
		Internships	N/A	No		
		Bursary	6-10	Yes		
		Work Experience	N/A	No		
Mining Production Supervisor	2021-312101	Candidacy	N/A	No	139	139
		Internships	N/A	No		
		Bursary	6-10	Yes		
Boilermaker	2021-651302	Artisan Development	3-4	Yes	60	100
Diesel Mechanic	2021-653306				188	200
Millwright	2021-671202				251	280

Source: Source: MQA WSP-ATR (31 May 2025), stakeholder interviews, and stakeholder Survey, MQA Annual Research Colloquium and SSP Validation Webinar

3.7. Emerging Occupations List

In addition to the SPOI list, the MQA recognises the existence of emerging occupations in the MMS that may require prioritisation. Building upon previous MQA research, stakeholder interviews, surveys, and the 2024 labour market intelligence project report on skills needs for the economy, particularly the critical report on the hydrogen economy, this list outlines the emerging occupations that the MQA will prioritise to further strengthen the future workforce of the MMS. Table 3.11. below presents the occupations emerging occupations recognised by the MQA.

Table 3. 11: List of Emerging Occupations in the MMS due to 4IR and the Hydrogen Economy

Emerging Occupation Name	OFO Code	Intervention Planned	NQF Level	NQF Aligned (Y/N)	Quantity Required	Quantity to be Supported	Rationale
* Data Management Manager	2021-133103	Internship	N/A	N	N/A	2	This is an emerging occupation as a result of 4IR
		Bursary	6-10	Y			
* Application Development Manager	2021-133104	Internship	N/A	N		2	
		Bursary	6-10	Y			
* Information Systems Director	2021-133106	Internship	N/A	N		2	
		Bursary	6-10	Y			
Marine Engineering Technician (**OFO Specialisation)	2021-311501	Internship	N/A	N		20	This is an emerging occupation as a result of the nascent green hydrogen economy
		Bursary	6-10	Y			

* Note: *The presented occupations are the management equivalents of the emerging occupations cited in research. They were utilised due to their availability on the OFO.*
** Note: *The presented occupation is a specialisation for Mechanical Engineering Technician.*
Note: *N/A is affixed to particular categories because since these are new and emerging occupations, the quantity that is needed by the sector is not yet known.*
Source: MQA 4IR Impact on Skills Demand and Supply Research (2024), Interviews and Identification of the Skills Needed for the Hydrogen Economy, DHET (2024)

3.8. Conclusion

The analysis of the MQA's WSP-ATR submissions over a five-year period (2021-2025) and discussions with stakeholders indicated that the perennially hard-to-fill occupations are as follows: Mine Manager, Mechanical Engineer, Mining Engineer, Engineering Manager, Mine Production Supervisor, Mining Technician, Diesel Mechanic, and Miner. The reasons for these hard to fill vacancies varied across individual, organisational, and supply-side levels. At the individual level, factors included a lack of relevant qualifications and experience. Organisational reasons are linked to equity considerations and inadequate remuneration.

The main supply-side concerns were found to be as follows:

- **Basic education:** While performance in MMS gateway subjects has improved over the past five years, this does not seem to translate to more enrolments and graduations at tertiary levels.
- **Higher Education:** There is less uptake and throughput of MMS related qualifications across the past five-year horizon.

- **Industry:** The bursary programmes supported by the sector prioritise disciplines crucial to the MMS, with a consistent focus on Mining Engineering and Electrical Engineering. However, although this is the case, there is still a consistent reporting of Mining Engineering as hard-to-fill and an occupation experiencing skills gaps. This discrepancy suggests potential issues such as high graduate starting salaries leading to talent being poached by other industries, or a mismatch between the specific skillsets graduates possess and the actual needs of employers within the MMS.

The current planning cycle necessitates a paradigm shift in MQA's approach to collaboration and intervention strategies. The SETA must move beyond a siloed model and embrace a more targeted and interlinked approach. By fostering deeper synergies between stakeholders across the skills development ecosystem, the MQA can develop and implement interventions that directly address the negative trends identified. Leveraging the positive achievements and lessons learned from the last cycle, a collaborative framework that fosters innovation and maximises the impact of interventions can be created. The next chapter will delve into these partnership efforts in greater detail, outlining specific strategies and partnerships designed to address the evolving skills needs of the sector.

CHAPTER 4: MQA PARTNERSHIPS

4.1. Introduction

The chapter presents the MQA's approach to partnerships, various MQA partnerships from strategic, special, education and training delivery, industry and professional bodies partnerships along with the most successful partnerships. The proposed partnerships are also presented. The sources of information utilised were the 2024 -2029 Medium-Term Development Plan, the MQA's APR, and previous research studies conducted by the MQA. Additional insights were also drawn from MQA Project Leaders overseeing these partnerships.

4.2. MQA Partnerships: Alignment with the MTDP

This chapter outlines the MQA's strategic partnerships and initiatives aligned with the MTDP's priorities of inclusive growth, job creation, poverty reduction, and improved governance. Through collaborations with universities, TVET colleges, CETs, and professional bodies, the MQA enhances educational quality, facilitates staff training, secures funding for bursaries and internships, and addresses sector-specific skills needs, such as those within the jewellery subsector. These efforts support job creation, skills development, and career pathways within the MMS. As will be seen in subsequent chapter, partnerships with entities such as the Mine Health and Safety Council, CSIR, and the Department of Basic Education promote technological innovation, safety, and early skills education, addressing evolving economic demands and reducing poverty in mining communities. Additionally, the MQA's planned collaborations with the Council for Geoscience and IDC aim to enhance geospatial intelligence and support small-scale mining, contributing to a capable, ethical, and developmental state while aligning with the MTDP's goals of improved governance and professional public service.

4.3. Analysis of MQA Partnerships

The MQA champions a collaborative approach to skills development within the MMS. Partnerships are intended to foster linkages between the labour market, employers, and sectors to ensure a better supply of the relevant skills (DHET, 2019). Partnerships refers to "a collaborative agreement between two or more parties intended to achieve specified outcomes directed towards addressing mutually inclusive skills priorities or objectives within a specified time frame" (DHET, 2019). Recognising the importance of existing sectoral needs, the MQA has established strategic partnerships with educational institutions, professional bodies, and research institutions. Notably, collaborations with research institutions equip the SETA with up-to-date labour market insights regarding critical skills supply and demand issues in the sector. These partnerships are not merely strategic; but are essential to fulfilling the MQA's mandate of fostering skills development. This aligns with Outcome 2 of the National Skills Development Plan (NSDP) 2030, which emphasises bridging the gap between education and workplaces. The MQA's partnership model goes beyond replicating these efforts. By fostering collaboration and innovation, this framework ensures high performance and supports the development, research, and implementation of effective skills development initiatives for the MMS.

4.3.1. MQA's Approach to Partnerships

To achieve its skills development mandate, the MQA leverages a **partnership framework** approved by its Board. This framework aligns with government directives such as the Mining Charter, NDP, MTDP, and NSDP, ensuring all efforts contribute to national priorities. Additionally, the framework outlines key partnership

areas, types of collaborations, and potential partners. The MQA's partnership framework prioritises collaboration for effective skills development within the MMS. This framework outlines four types of partnerships – resource sharing, knowledge exchange, policy and governance collaboration, and joint advocacy. Partners encompass a wide range of stakeholders: educational institutions, government entities, industry employers, and civil society organisations. By fostering collaboration across these diverse groups, the MQA aims to achieve several key benefits. Partnerships expand the MQA's reach and expertise, equip the organisation with up-to-date labour market insights, and facilitate fulfilling its skills development mandate. In line with outcome 2 of the MTDP (Increased employment opportunities which includes strengthening the partnership with the private sector to unlock the deployment of artisans and TVET graduates through workplace-based placements and work integrated learning opportunities) these partnerships ultimately enable the MQA to work directly with industry beyond traditional boundaries. This fosters enhanced alignment between training programmes and industry needs, solidifying collaboration as a cornerstone of the MQA's skills development strategy. Figure 4.1 below provides a breakdown of this framework.

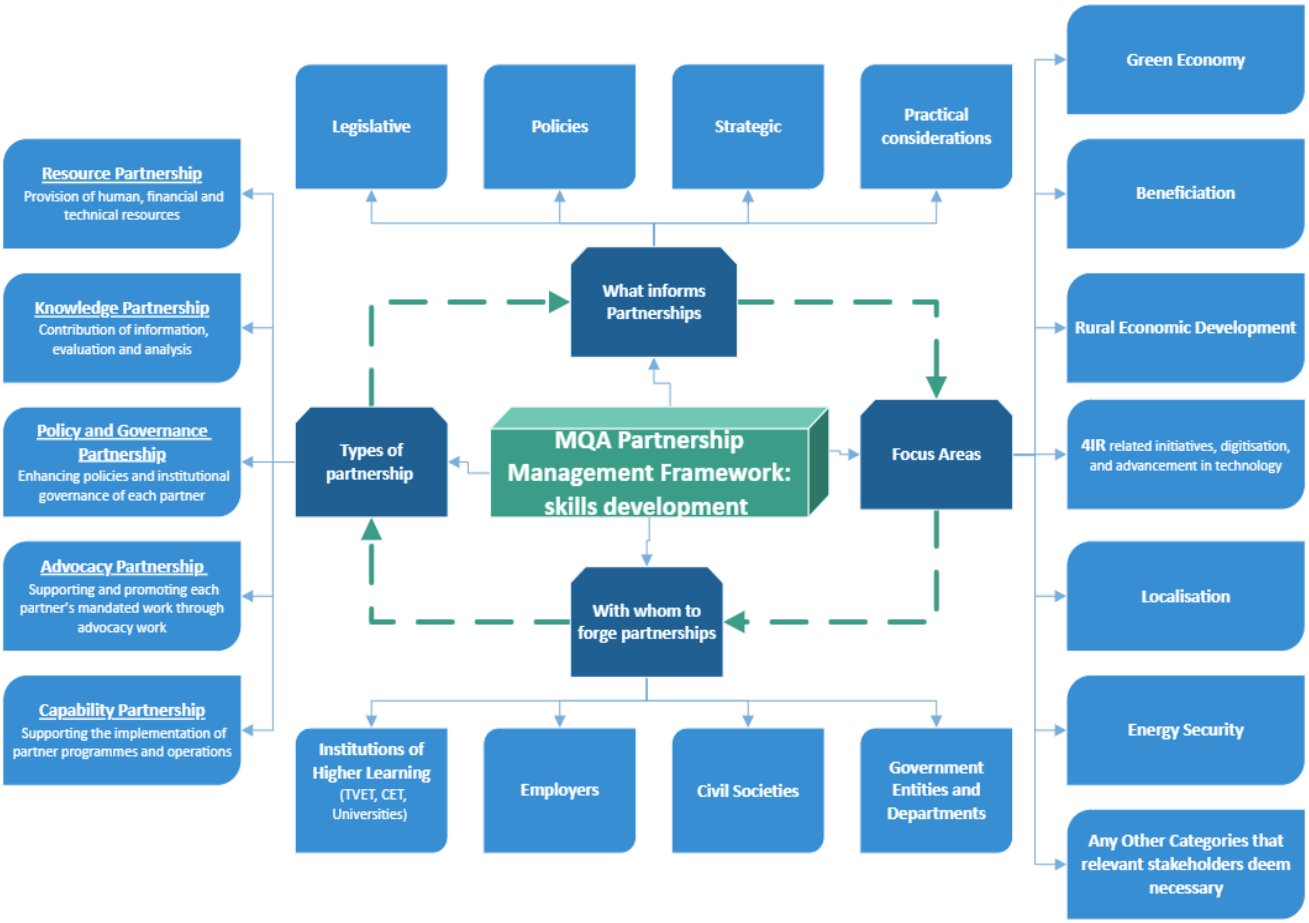


Figure 4. 1: MQA Partnership Framework

4.4. Strategic and Special Projects Partnerships

Strategic and special projects are integral to addressing critical issues plaguing the MMS. These initiatives leverage collaborative efforts with a diverse range of stakeholders to develop effective solutions. While the MQA does not currently have any special project partnerships, a dedicated focus on identifying and prioritizing these critical areas remains paramount. The MQA is committed to ongoing exploration of impactful collaborations that will demonstrably improve the MMS. The existing strategic partnerships are listed in table 4.1. below.

Table 4. 1: Strategic and Special Partnerships

Partner Organisation	Nature of Partnership (Start & End Dates)	Objective(s)	Value-add
Mpumalanga Department of Economic Development and Trade (DEDT)	Skills development (11th March 2023 - 24 January 2028)	Cooperate in the Implementation of skills development initiatives in the Mpumalanga Province	*Tailored skills development programmes to meet provincial needs. *Access to provincial resources and funding for initiatives. *Improved alignment between national and provincial skills development strategies.
Mine and Health Safety Council (MHSC)	Capacity building (11th March 2023 - 31 March 2030)	Collaborate in resources, knowledge on safety issues, policy, and governance	*Improved safety standards and practices within the MMS. *Joint development of safety training programmes and resources allocation. *Credibility and legitimacy for MQA's safety-related initiatives.
Centre for Scientific Industrial Research (CSIR)	Skills development (11th March 2023 - 31 March 2030)	To collaborate and support national strategies and national career development initiatives	*Access to CSIR's research expertise to inform skills development strategies. *Development of data-driven approaches to skills development planning. *Improved alignment between skills development initiatives and national needs.
Chemical Industries Education & Training Authority (CHIETA)	Research skills transfer (11th March 2023 - 31 March 2030)	To collaborate in interventions targeted at the hydrogen economy and in advancing the just transition into the green hydrogen economy	*Sharing of knowledge and expertise relevant to the hydrogen economy. *Joint development of training programmes for the green mining skills needs. *Fostering innovation and technological advancement in the sector.
National Youth Development Agency (NYDA)	Skills development (11th March 2023 - 31 March 2030)	To collaborate in activities and/or interventions supporting Small, Medium and Micro Enterprises (SMMEs), Placement, Coaching, Mentorship and Training in the mining and mineral sector	*Improved access to skills development and career opportunities for youth in the MMS. *Support for SMMEs in the MMS through skills development initiatives. *Enhanced youth entrepreneurship and participation in the mining economy.
South African Nuclear Energy Corporation (Nesca)	Skills development (01 April 2025 -31 March 2030)	To collaborate and implement skills development projects (Artisan development, occupational qualifications, Artisan Recognition of Prior Learning (ARPL), Trade Testing, Non-Artisan and Artisan learnerships and Radiation Protection Programmes)	*Implementation of comprehensive skills development pathways—including Artisan programmes, occupational qualifications, and ARPL—to improve access to trade careers.
AMMSA (Association of Mine Managers of SA)	2023/2024 - 31 March 2030	To collaborate and roll out youth programmes, evaluate outcomes	*Partner on research, community and youth programmes. *Direct support to vulnerable groups within mining communities.

Partner Organisation	Nature of Partnership (Start & End Dates)	Objective(s)	Value-add
			*Contributing to developmental initiatives that enhance living conditions and provide support structures for affected families.
CET Colleges (all 9 CETCs)	Ongoing	*To collaborate and implement skills development projects *AET programme delivery, infrastructure support, lecturer training, curriculum	*The partnership primarily funds AET programs, internships, and lecturer development (moderator and assessor training). *CETCs receive funding to enroll learners in registered AET programs, with a maximum amount payable per learner. *Training areas include health and safety, fundamentals of mining, mineral processing, basic jewellery design, gemmology, and computer-aided design relevant to mining.

Overall, the partnerships identified above position the MQA to address the evolving skills landscape of the MMS more effectively. They provide access to specialised expertise, regional knowledge and expertise, and research capabilities, enabling the MQA to create targeted programmes and interventions that equip future generations with the skills needed to thrive in a changing mining environment.

4.5. Education And Training Delivery Partnerships

The MQA prioritises collaboration with universities, TVETs, and CETs to address skill needs in the sector. These partnerships focus on multiple areas. This is in keeping with the MTDP's outcome 3, Skills for the economy, which focuses on increasing access, improving the quality and efficiency of the PSET system. First, they aim to enhance the learning experience for students through dedicated learner support programmes and resources. Second, the MQA works with these institutions to improve the overall quality of teaching and learning within their programmes. Furthermore, the partnerships provide training opportunities for staff at CETs and TVETs, specifically focusing on areas such as corporate management, governance, assessment, and moderation skills. Finally, the MQA collaborates with these educational institutions to secure funding for various initiatives such as learnerships, work-based learning programmes, internships, and bursaries. By increasing the number of graduates equipped with relevant skills and encouraging them to pursue careers in the MMS, these partnerships ultimately aim to address skill gaps and imbalances within mining communities. Table 4.2. below presents the partnerships that the MQA has with PSET institutions.

:

Table 4. 2: Partnerships with PSET Institutions

Institution / Partner Organization	Nature of Partnership (Start & End Dates)	Objectives	Value-add
10 Universities (UniVen, UL, UCT, UJ, UNISA, NWU, CPUT, UWC, UFS & WSU)	Funding, Lecturer support, Workplace placement & Capacity building (2023/12/08 - 2030/03/31)	Funding of Bursars, Graduate placement, WUSU student placement, Lecturer Support, Career Guidance, Learner support programmes, Adjunct Professor initiatives, Industry expert membership in academic boards	*Increased MQA footprint for wider skills development. *Funding for bursaries to support students pursuing mining qualifications. *Access to industry experts for improved curriculum and programme development. *Enhanced practical learning experiences for students through workplace

Institution / Partner Organization	Nature of Partnership (Start & End Dates)	Objectives	Value-add
			placements. *Capacity building for universities through professorial initiatives.
30 TVETS (Ekurhuleni East, Southwest Gauteng, King Sabata Dalindyebo, King Hintsa, Lovedale, Vuselela, Orbit, North Link, West Coast, College of Cape Town, False Bay, Tshwane South TVET College, Ingwe, Maluti, Goldfields, Flavius, Mareka, Majuba, Coastal KZN, Umfolozi, Elangeni, Vhembe, Mopani, South East, Sekhukhune, Capricorn, Waterberg, Letaba, Northern Cape Urban, Northern Cape Rural, Nkangala, Gert Sibande)	Lecturer support, Learner bursary & Work-placement experiences (2023/03/21-2033/02/31)	Equip people with knowledge and skills for corporate governance & expose them to real-world work experiences. Capacitate lecturers to improve teaching and learning.	*Improved access to education and more support for integrated work-based learning for students. *Upskilling and capacity building for TVET lecturers. *Practical work experience opportunities for TVET students through workplace placements. *Scaling up skills development to meet the industry's growing demand. *Increased coverage across all 9 provinces, contributing to poverty reduction, unemployment, and inequality.
9 CETs (Eastern Cape, Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, Northern Cape, North West, Western Cape)	Lecturer support (CET college teaching and learning) (2024/03/31-2026/03/31)	Capacitate lecturers to improve teaching and learning.	*Scaling up skills development to meet the sectoral skills demand. *Improved quality of teaching and learning within CET institutions.

In an MQA study entitled “the assessment of the effectiveness of partnerships between the MQA and CETs (2024), it was found that the MQA's partnership with CETs has demonstrably benefited individuals and communities within the MMS. Nearly 500 learners gained valuable General Education and Training Certificates, opening doors to employment, further education at TVET colleges, and even started their own businesses. The broader community also experienced a positive impact through a rise in overall education levels and the potential shared use of improved facilities used as Skill Learning Centres (SLCs).

However, the impact on skills development specific to the MMS appears limited. While the partnership funded assessor and moderator training for lecturers, and these programmes were well-received, there's a call for a broader approach. To ensure the MMS has a workforce equipped with the necessary skills, future partnerships should consider incorporating training programmes aligned with industry needs. This could encompass areas such as health and safety, fundamentals of mining, or even specialised programmes in mineral processing, basic jewellery design, or diamond identification. By expanding the scope of the partnership beyond lecturer training and into these targeted skills areas, the MQA and CETs can make a significant contribution to developing a more skilled MMS workforce.

4.6. Industry and Professional Bodies Partnerships

The MQA prioritises evidence-based decision-making for skills development in the MMS. The SETA achieves this through research partnerships. This collaboration allows the MQA to gain critical insights into labour market trends, specifically focusing on the supply and demand of skills within the MMS. This data is then used to inform and guide the MQA's skills planning and intervention strategies. In the 2024-2025 period, the

MQA
contracted with University of Witwatersrand and University of Pretoria as their Research partners. The

purpose of these partnerships was to have them assist the MQA in undertaking sector related research. Details the research undertaken for this period is provided in the table 4.3. below.

Table 4. 3: Industry and Professional Bodies Partnerships

Institution / Partner	Nature of Partnership (Start & End Dates)	Objectives	Value-add
Wits Enterprise	Knowledge Partnerships and Skills Capacitation (September 2024 – March 2026)	Investigating the state of artisan supply and ways of enhancing their skills in the mining and minerals sector	Provides a basis for strengthening artisan training through alignment with sector needs, employer expectations, and global best practices.
		Identify and analyse the factors that influence submission rates of WSP-ATR in the mining and minerals sector	Informs the development of targeted interventions and enhanced stakeholder engagement to improve compliance and increase the submission of WSP-ATRs.
		Exploring the state and nature of the green hydrogen technology in the Mining and minerals sector	Provides a basis for targeted MQA interventions to support skills development aligned with green hydrogen innovations.
		Exploring beneficiation skills that can be prioritised in the Mining and minerals sector	Proposes targeted MQA interventions to enhance skills development for mineral beneficiation.
Enterprises University of Pretoria		Challenges and opportunities for Small-Scale Mining in the South African Economy.	Proposes strategies for enhancing skills development for supporting ASMs.
		The quest towards attaining JET: Assessing the implementation of ESG-related skills to determine the requirements for skilling and upskilling of the MMS.	Proposes targeted MQA interventions to support skills development that facilitates the adoption of ESG principles and the achievement of a JET.
		Exploring the skills levels and knowledge gaps of the existing OHS representatives in the MSS.	Proposes interventions for enhancing training and development programmes to strengthen OHS representative skills within the sector.

4.7. Most successful SETA partnership

Figure 4.2. below demonstrates MQA's successful partnerships for the financial year 2023/24.

CETs	*TVETs*	*Universities*
* A total funding of R1 925 000,00 was given to 388 CET learners who were enrolled in AET programmes. Each learner was allocated a total of R 5000. *The total cost of R76 500,00 was spent on training 17 CET managers on curriculum-related studies, with each learner allocated R4,500. *45 CET college lecturers benefited from the skills development programmes amounting to the budget of R202 500,00 with R 4500 allocated per each lecturer. 32 graduates were able to receive funding of R4 992 000 for CET internships, with each graduate being allocated R156 000.served by the colleges. mining engineering, and geology.	*The 73 TVET College lecturers who were awarded bursaries benefitted from a budget of R6 570 000,00 with R 90 000 allocated for each lecturer. *A total of R28 266 000,00 was invested by MQA in 31 TVET partnerships *Partnerships established with 13 TVET colleges to offer Artisan Development COS with a total budget of R21 660 450,00.	Among others, 223 unemployed learners were awarded a bursary to pursue mining-related qualifications at the University of Johannesburg, 60 learners at the University of Witwatersrand, 22 learners at the University of Venda, 188 at Tshwane University of Technology and 35 at Northwest University.

Figure 4. 2: MQA's 2024/25 successful partnerships.

4.8. Challenges faced by the SETA partnerships

While the MQA's partnerships have achieved notable successes (as detailed above), challenges have also arisen. These challenges are further explored in table 4.4 below.

Table 4. 4: MQA Partnership Challenges

Research	TVETs and CETs	Universities
* Research partners often lacked sufficient expertise in the SA skills system, skills development, and the SETA landscape, rendering research recommendations often impractical or lacking required contextuality and specificity. * Protracted project contracting.	* Ensuring training programmes remain relevant and meet the evolving expectations of industry for graduates in areas such as JET, Beneficiation and 4IR. * Restriction of MQA funding policy to support TVET and CET infrastructure, a major contributing factor to the above challenge.	*While funding students for existing qualifications remains a strongpoint as seen above, Universities do not seem poised to train students on the Green Hydrogen Economy. This is evidenced by qualifications that do not yet exist which are crucial for this nascent, yet increasingly prevalent economic sector.

4.8.1. What should be done to address the experienced challenges to strengthen partnerships?

Below are some recommendations to address the challenges experienced in MQA's partnerships and foster stronger collaboration:

RESEARCH:

✓	**Targeted Contracting and/or Collaboration:** Identify universities with strong skills development entities and partner with them or make it a prerequisite for appointed research partners to collaborate with them.
✓	**Timely Appointments:** The appointment of Research Partners to align with the medium-term planning cycle.
TVETs and CETs:	
✓	**Intensify Lecturer Support Programmes:** Continue to support TVET and CET lecturers along with CET managers with requisite skills to adapt pedagogy and curriculum to meet changing MMS needs.
✓	**Reform MQA Funding Policy to Include Infrastructure Support for TVETs/CET:** Enact intensive review of MQA funding policy to see how it can be augmented to include funding for infrastructure to assist TVETs and CETs with resources to meet industry needs.
UNIVERSITIES:	
✓	**Intensive advocacy for JET:** The MQA must carefully engage universities to share research findings on JET and Green Hydrogen and determine measures to support the creation of qualifications that must be in place to support these emerging fields.

Performance Monitoring: Implement performance monitoring metrics to track progress towards partnership goals and identify areas for improvement. The MQA's existing M&E Unit is a valuable asset for implementing performance monitoring. As will be seen in Chapter 5, this Unit has expertise in data collection, analysis, and reporting, which can be directly applied to monitor partnership performance. The MQA M&E Unit will be crucial to define PIs, collect data, and interpret findings to inform partnership adjustments.

4.9. Proposed Partnerships

In light of the change drivers and policy frameworks influencing skills demand and supply discussed in Chapter 2, coupled with the supply and demand challenges detailed in Chapter 3, it is evident that the MQA requires the establishment of new partnerships. While the MQA boasts a robust network of partnerships, expanding collaborations presents a strategic opportunity. By incorporating new partners, the MQA can broaden the talent pool for the MMS and diversify the expertise contributing to skills development initiatives. These partnerships can unlock access to untapped talent pools, introduce fresh perspectives, strengthen industry engagement, and potentially secure additional funding and resources. Ultimately, a wider and more diverse network allows the MQA to significantly enhance its capacity to address the ever-evolving skills needs of the MMS and ensure a future workforce equipped for success. The table below provides for the proposed partnerships for the financial year 2024/25.

Table 4. 5: Proposed Partnerships

Institution	Strategic Focus	Rationale
Stats SA	Labour market intelligence sharing	Gain accurate statistical reports (economic performance, labour profiles, retrenchments) for more targeted skills development programmes and research.
Department of Land Reform and Rural Development (DLRRD)	Support for rural mining communities	Collaborate to develop skills programmes for rural community development and small-scale mining and fostering sustainable development.
Social Dialogue on JET	Participation in the JET Skills Desk	Receive guidance from the JET Skills Desk to gain relevant information on JET initiatives across the country to identify potential partnerships for JET skills, to avoid the duplication of efforts in the JET and to ensure a skills pipeline appropriate to the MMS in line with outcome 1 (A Just Energy Transition) of the MTDP.
Human Resource Development Council (HRDC)	Guidance from the JET Advisory Forum	Assist the MQA to build partnerships across stakeholders for the implementation of the JET Skills Plan in line with outcome 1 (A Just Energy Transition) of the MTDP.

Institution	Strategic Focus	Rationale
Presidential Climate Commission (PCC)	Occupy the forefront of developments in transitions to a low-carbon economy	Enable the MQA to contribute its sectoral role in advancing skills development to support South Africa's transition to a sustainable, low-carbon economy.
Inter-Departmental Forum on Critical Minerals Strategy	Develop human capital to support exploration, beneficiation, and other MMS value chain activities.	Support Skills development in the critical minerals value-chain including but not limited to exploration and beneficiation
Department of Environmental Affairs (DEA)	Support for skills related to EIA, environment management, green skills	Identify and integrate "green skills" into training programmes, ensuring a future workforce equipped for environmentally conscious practices aligned with industry trends.
Industrial Development Corporation (IDC)	Development funding	Identify skills gaps related to IDC's funding requirements and leverage their business development support for small-scale mining enterprises.
Council for Geoscience	Geospatial intelligence	Access information on mining-related activities and skills necessary for exploration, informing curriculum development.
AMMSA	Expert advice, access to active mines	Gain insights on mining activities and related skills needs, ensuring training programmes remain relevant.
Minerals Council SA	Trends and developments in the MMS	Collaborate on research, WSP-ATR submissions, and leverage their expertise on MMS-related matters.
Mineworkers Development Agency	Alternative socio-economic livelihoods for ex-mineworkers	Partner to implement skills development interventions that equip ex-mineworkers with new skills for re-entry into the workforce.
Women in Mining South Africa (WimSA)	Support for women's participation in the MMS	Partner on strategic and skills development programmes to achieve gender equity in the MMS workforce.
South Africa Diamond and Precious Metals Regulator	Mineral policy and regulation	Access information on regulatory guidelines to ensure compliance when developing skills development programmes.
Jewellery Council of South Africa	Skills development and capacity building	Collaborate to identify specific skills needs within the jewellery sector of the MMS.
FASSET	Mining community development programmes	Collaborate on projects related to funding mine communities in the sector after completion of Mine community training development programmes.

4.10. Planned Partnerships to address SETA Integrated High Impact Programmes (SIHIPs)

In the recent SETA Skills Summit, it was resolved that the effective implementation of SIHIPs would entail fostering impactful partnerships with PSET institutions, promoting interdepartmental and intergovernmental collaboration to equip youth with globally competitive skills through meaningful SETA partnerships, ensuring the SIHIPs are reflected in SETA's strategic plans and annual performance plans. It was also resolved that these imperatives could be resolved by implementing the six SIHIP programmes, namely:

1. Infrastructure Development and Public Sector Institutional Delivery Capacitation
2. Significant reduction in unemployment, including graduates.
3. Sustainable entrepreneurial, SMME, and cooperatives development
4. Comprehensive digitisation and technological infrastructure advancement, research, and development
5. Effective shared ICT services for SETA-wide Learner Information Management System
6. Rural development for community impact

In line with programme four and six, the MQA has consolidated a partnership with the CHIETA, TETA and the CSIR with the purpose of building a centre of specialisation focusing on the green hydrogen economy. Following a recent workshop involving the four organisations, the following decisions were made as part of

the next steps in this partnership:

- Each SETA must identify and develop skill programs and qualifications needed immediately, tailored to their sectors' needs. For the MMS, this includes training trades people to repair and maintain green hydrogen-powered trucks, with MQA's support.
- Finalize the main skills sets needed in green hydrogen by identifying areas where most jobs can be created.
- Source additional funding from various sources.
- The three SETAs will equally contribute to establishing the Centre.
- Recruit and retain top talent for the Centre of Specialisation.
- Establish partnerships with industry and academia for the Centre.
- CSIR to develop a proposal/business plan for initial or seed funding for the Centre, which each SETA will present to their Boards.
- Finalize a tripartite MoU between MQA, CHIETA, and TETA.

It is envisaged that this partnership will not only meet the imperatives of the SIHIPs but will also mitigate the challenges identified in Chapter 3, along with meeting the skills needs necessitated by change drivers such the use of alternative energy sources in light of the dwindling energy supply.

4.11. Conclusion

The MQA's partnership-driven approach creates a responsive skills ecosystem for the sector's evolving needs. By strategically collaborating with educational institutions, research bodies, and industry stakeholders, the organisation addresses both current skill gaps and future workforce requirements. These multi-layered partnerships deliver core technical training while advancing specialised competencies in emerging areas such as AI, geospatial intelligence, and green technologies. The model extends beyond traditional education through innovative collaborations that support vulnerable groups (NEETs, ex-mineworkers) via reskilling programmes and small-scale mining entrepreneurship development. Additional alliances further enrich this strategy by incorporating global best practices, as demonstrated in the cross-SETA/CSIR partnership for just energy transition preparedness. This network ensures the MMS maintains its competitive edge by cultivating an adaptable workforce equipped with both foundational skills and cutting-edge capabilities, while simultaneously driving sustainable development and inclusive growth across the industry.

CHAPTER 5: MONITORING AND EVALUATION

5.1. Introduction

The chapter focuses on Monitoring and Evaluation (M&E) in the MQA. **It focuses** on MQA's M&E approach and how it informs skills planning and reporting. The sources of information are from the 2023/24 APP, APR, SP and findings from tracer studies. Additional insight information was obtained from internal personnel within the MQA M&E Unit. This first section of this chapter reflects on sector skills planning reflections.

5.2. SETA Skills Planning Reflections

The MQA is dedicated to continuous improvement in skills development within the sector. This sector skills planning reflection serves as a crucial self-assessment tool. It will delve into the SETA's approach to M&E, examining how the MQA uses information from previous year's Annual Report and Reports from Tracer Studies to inform research and planning. Importantly, the reflection will evaluate progress made in implementing interventions and measures that support national strategies such as the ERRP, NSDP, and relevant master plans. Finally, the reflection will examine the current status of implementation for strategic skills priorities identified in the previous SSP. By addressing these questions, the MQA aims to identify areas of strength, acknowledge challenges, and ultimately chart a more informed and impactful course for future skills development initiatives within the MMS.

5.2.1. M&E: Five-Year Reflections

Improvements in M&E over the past five years include the fortification of the Risk sub-unit, the conscientisation of MQA staff as practitioners of M&E and the adoption of virtual learner verification methods.

- The appointment of the Senior Manager: Risk Management & Compliance in April 2023 greatly strengthened the Risk Unit, shifting it from reactive compliance to proactive risk management through regular risk workshops and quarterly updated registers. In 2025/26, the Risk Unit plans to hire a Senior Administrator and an Administrator, increasing its staff to five (excluding two ISO roles) and significantly boosting its capacity.
- The MQA has broadened M&E from a single Unit to an organisation-wide practice through capacity-building workshops, fostering cross-unit collaboration, including Research, and leveraging strong internal relationships to engage high-performing research partners for quality outputs.
- The Risk and M&E Unit is addressing capacity challenges through effective online verification, which saves travel time and increases checks. A planned digital system with decision-tree logic will strengthen fraud detection and accuracy, requiring skilled auditors. This forms part of the MQA's ERP rollout to digitise operations, including Risk and M&E.

To build on the successes of the past five years and address challenges, the MQA over the past year has implemented several strategic initiatives including the following:

- The developing MIS system will standardise data collection for consistent impact analysis. Hiring three Administrators to manage data entry will build a more reliable database. Addressing current inconsistencies (e.g. project owners providing employer instead of learner details) will enhance efficiency

- and
  clarity on MQA programme effectiveness. The M&E Unit's capacity has recently improved with the appointment of an M&E Officer.
- The M&E Unit conducts annual tracer studies to evaluate programme relevance and learner outcomes. Results show most learners in learnerships, artisanships, and internships secure permanent jobs. The Unit exceeded its target of 15 studies in five years and continues this vital monitoring yearly.
- Managers and officials from the M&E Unit attended a Power BI course, where tools for reporting were explored. This indicates a future direction towards using data visualisation tools to disseminate M&E findings more effectively.
- The Unit consults with SETAs (MICTSETA, EWSETA, MERSETA, SASSETA) to benchmark M&E practices and plans further engagements. They also review Department of Social Development policies and DPME evaluation guidelines. Meanwhile, the Risk Unit benchmarks with public sector risk forums and IRMSA to stay updated on national risks and assessment methods.

5.2.2. MQA's Approach to Monitoring and Evaluation

The MQA's Risk, Monitoring, Evaluation, and Quality Assurance Unit manages a rigorous project monitoring system with three key functions: (1) Using M&E data to guide strategic planning and resource allocation for maximum sector impact; (2) Optimising project management by tracking progress throughout the project lifecycle to ensure successful outcomes; and (3) Conducting impact and tracer studies to evaluate the effectiveness of training programmes on beneficiaries. The MQA gathers data for its M&E processes through a variety of methods. These methods can include on-site visits to employers or training providers directly involved in the project. Alternatively, the MQA conducts desktop verifications, meticulously analysing project documentation and relevant data to assess projects.

5.3. Utilisation of APR and Tracer Studies to inform Research and Planning

As previously mentioned, the MQA's M&E Unit plays a critical role in assessing the effectiveness of its interventions through tracer and impact studies. These studies leverage valuable data sources, including information from the prior year's APR. By analysing these reports, the MQA can gauge progress, efficiency, sustainability, and ultimately, the overall impact of its initiatives.

Tracer studies hold particular significance. They extend beyond simply evaluating interventions; they track past learners to gather post-intervention data. This comprehensive approach allows the MQA to assess the long-term impact of its programmes on beneficiary skills and career trajectories. In essence, M&E and tracer studies, as INTRAC (2017) highlights, are primarily concerned with evaluation and impact assessment. They are designed to answer crucial questions about "what changed, when, and why," ensuring the MQA's interventions deliver lasting and measurable results.

Three tracer studies were conducted in 2024/25, namely:

1. Impact Assessment and Evaluation of the Effectiveness and Relevance Of CET-AET Programme for the Past Three Years: The primary focus of the study was to provide an analysis to measure the performance of the Community Education and Training (CET) and Adult Education and Training (AET) programme over a three-year period from 2021/2022 to 2023/2024 with respect to achievements, challenges, and recommendations.
2. An Impact Analysis Study On The National Certificate (Vocational) NCV NQF Level 4 Graduates in the Mining And Mineral Sector 2021/2022 to 2023/2024: The primary focus of this study was to evaluate

the
effectiveness, relevance, and overall impact of these qualifications on graduates' employment outcomes, career progression, and contribution to the sector over the period from 2021/2022 – 2023/2024 Financial Year.

3. Impact Assessment and Evaluation of the Effectiveness and Relevance of the Presidential Youth Employment Initiative (PYEI)/WIL for the Past Three Years: The study aimed to provide an analysis and to measure the performance of the identified Presidential Youth Employment Initiative (PYEI)/ WIL programme over a three-year period from 2021/2022 to 2023/2024 with respect to achievements, challenges, and recommendations.

Furthermore, the MQA APR is one of the valuable tools used for skills planning and informing research within the organisation. By analysing trends in employment, qualifications offered, and industry needs, the report help identify areas where there are skills gaps or surpluses. This information is then be used to develop targeted skills development programmes and inform research initiatives that address the specific needs of the sector. For instance, if the report reveals a decline in the number of professionals entering the mining industry, research could be conducted to understand the reasons behind this trend and develop strategies to attract more graduates to these fields.

5.4. Strategic Priorities in the previous SSP captured in the MQA's SP & APP

The following, table 5.1., reflects on the MQA's strategic priorities that were captured in its APR and Strategic Plan.

Table 5. 1: Strategic priorities in the previous SSP captured in the MQA's Strategic Plan and APP

Strategic priorities	2025-2030 Strategic Plan	2024-2025 Annual Performance Plan	Extent of Implementation
Constant engagement with the MMS for collaboration in various programmes to bridge the gap between workplace and training institutions for a fit for purpose skills development system	Programme 2: Research	Programme 2: Research. Conduct research including impact studies to measure programme, responsiveness, relevance, and sustainability and to gather empirical-based insights to inform and guide sector skills planning and implementation of skills development interventions in the MMS.	* In FY 2024/25, WSP-ATR submissions rose significantly to 965 from 827 in 2021/22, a 17% increase over four years. This growth was driven by 164 new companies submitting, outweighing the 26 that stopped. The rise in submissions enhances the data available for sector skills planning
Strengthen existing partnerships for effective skills development and develop plans to support the implementation of SIHIPs	Programme 2: Research. Programme 3: Learning Programmes Programme 4: Quality Assurance, Monitoring and Evaluation	Programme 2: Research. Conduct research including impact studies to measure programme, responsiveness, relevance, and sustainability and to gather empirical-based insights to inform and guide sector skills planning and implementation of skills development interventions in the MMS. Programme 3: Learning Programmes. Facilitate opening of workplace-based learning opportunities and access to occupationally directed programmes. Facilitate training for stakeholders, communities, and entrepreneurs. Support industry collaboration with public college system.	MQA interventions that strengthen existing partnerships and that align with the six SIHIP priorities include: * Ongoing mine community and unemployed youth skills Programmes Unemployed learnerships, Internships and bursaries. * Ongoing small-scale mining, small business support and entrepreneur skills Programme. * 2022/23 FY Research on impact of 4IR in supply and demand in the MMS as well as 4IR interventions such as Artificial Intelligence, Cyber Security, Cloud computing, Design thinking Practitioner, Data science, Internet of Things, Systems development, Robotic Processing

Strategic priorities	2025-2030 Strategic Plan	2024-2025 Annual Performance Plan	Extent of Implementation
		Programme 4: Quality Assurance, Monitoring and Evaluation. Ensure the delivery of quality and impactful learning programmes in the MMS.	Automation, Quality Engineering Automation. * Engagement with MICTSETA and other SETAs to collaborate on the development of the learner information management system. * Ongoing mine community and unemployed youth, career awareness * The MQA has ringfenced funding for infrastructure development and IS collaborating with other institutions such as the CSIR, CHIETA, TETA for the development of a green hydrogen centre of specialisation as one example.
Heighten efforts to facilitate the growth and support of ASM through skills development.	Programme 2: Research Programme 3: Learning Programmes	Programme 2: Research. Conduct research including impact studies to measure programme, responsiveness, relevance, and sustainability and to gather empirical-based insights to inform and guide sector skills planning and implementation of skills development interventions in the MMS. Programme 3: Learning Programmes. Facilitate opening of workplace-based learning opportunities and access to occupationally directed programmes. Facilitate training for stakeholders, communities, and entrepreneurs. Support industry collaboration with public college system.	* The MQA's research on the Challenges and Opportunities for Small-Scale Mining in The South African Economy revealed the following: To maximise artisanal and small-scale mining opportunities and address challenges, the MQA should collaborate with stakeholders like DMPR and IDC to streamline licensing, develop capacity programmes, foster public-private partnerships for equipment and market access, and promote environmental compliance. This is urgent as MQA's small-scale mining programme beneficiaries dropped 21%, from 283 in 2021/22 to 223 in 2023/24. The study's recommendations can help reverse this decline.
Continue to support interventions to improve mine health and safety through skills development and increasing the number of safety officers in the MMS.	Programme 2: Research Programme 3: Learning Programmes	Programme 2: Research. Conduct research including impact studies to measure programme, responsiveness, relevance, and sustainability and to gather empirical-based insights to inform and guide sector skills planning and implementation of skills development interventions in the MMS. Programme 3: Learning Programmes. Facilitate opening of workplace-based learning opportunities and access to occupationally directed programmes. Facilitate training for stakeholders, communities, and entrepreneurs. Support industry collaboration with public college system.	* The MQA's research into Examining the Skills Levels and Knowledge Gaps of the Existing OHS Representatives in the MMS recommended the following: Revising OHS curricula to equip representatives with skills for new MHSA tasks and addressing barriers like leadership gaps, gender bias, and unclear career paths to support their transition to OHS officers. * The MQA's APP shows 4,318 workers completed OHS training in 2021/22, dropping to 3,972 in 2022/23, then recovering to 4,287 in 2023/24 (just 1.2% below 2021/22) demonstrating steady commitment to MMS occupational health and safety.

Strategic priorities	2025-2030 Strategic Plan	2024-2025 Annual Performance Plan	Extent of Implementation
Align skills development with evolving technologies in the MMS	Programme 2: Research. Programme 3: Learning Programmes Programme 4: Quality Assurance, Monitoring and Evaluation	Programme 2: Research. Conduct research including impact studies to measure programme, responsiveness, relevance, and sustainability and to gather empirical-based insights to inform and guide sector skills planning and implementation of skills development interventions in the MMS. Programme 3: Learning Programmes. Facilitate opening of workplace-based learning opportunities and access to occupationally directed programmes. Facilitates training for stakeholders, communities, and entrepreneurs. Supports industry collaboration with public college system. Programme 4: Quality Assurance, Monitoring and Evaluation. Ensure the delivery of quality and impactful learning programmes in the MMS.	* The MQA introduced an elementary digital skills programme that began this financial year (2024/25) under the AET intervention. * The MQA plans to add a mining stream with digital literacy to the Umalusi GETC, with project launch expected in 2025/26 FY; engagements with Umalusi are ongoing to finalize this. * Under the QCTO review, sector experts regularly update learning programs to include the latest tech and combine theory, practice, work experience, and soft skills. * Partnering with Mandela Mining Precinct, the MQA integrates emerging technologies into training and expands its network to include OEMs, keeping pace with MMS innovations. * The MQA and MICTSETA collaborate on 4IR non-artisan learnerships, training 150 students in 2024/25; continuation into 2025/26 depends on budget
Implement skills development support for the ex-mine workers and the NEET population.	Programme 3: Learning Programmes	Programme 3: Learning Programmes. Facilitate opening of workplace-based learning opportunities and access to occupationally directed programmes. Facilitates training for stakeholders, communities, and entrepreneurs. Supports industry collaboration with public college system.	* In 2023/24 FY, 223 beneficiaries from mining communities, including 158 women seeking mining permits, completed accredited small-scale mining training to support sustainable business and employment. * The Unemployed Youth Development project trained 2,435 youth (18–35 years) from mine host and labour sending areas in portable skills like plant/animal production, construction, business, computing, renewable energy, environmental practice, and cellphone repairs; 2,144 completed training.
Develop a Research Recommendations Implementation Framework to maximize the impact of research on sector planning.	Programme 2: Research.	Programme 2: Research. Conduct research including impact studies to measure programme, responsiveness, relevance, and sustainability and to gather empirical-based insights to inform and guide sector skills planning and implementation of skills development interventions in the MMS.	* The MQA is developing its first research recommendations implementation framework, including a live dashboard planned for 2025/26 FY. * Over five years, 14 research projects were conducted, including the 2025-2030 Sector Skills Plan, covering critical topics for sector growth. The framework will track how recommendations are or will be implemented, offering stakeholders

Strategic priorities	2025-2030 Strategic Plan	2024-2025 Annual Performance Plan	Extent of Implementation
			insights into MQA's efforts for a resilient MMS future. It will guide decision-making and resource allocation to meet evolving sector needs effectively. The framework details each project's aim, recommendations, actions, key stakeholders, responsible MQA units, and implementation timelines.

5.5. Status on the Implementation of Interventions and measures in support of National Strategies and Plans

The MQA's diverse range of programmes aligns with multiple national strategies, including the NDP, NSDP, and ERRP. These programmes address critical areas such as artisan skills development, workplace safety, youth employment, community development, and small business growth within the mining and minerals sector. By aligning with these national priorities, the MQA ensures its skills development efforts contribute to broader socio-economic goals in South Africa. A five-year trends analysis is presented in table 5.2. below, indicating the MQA's support for national strategies and plans.

Table 5. 2: Measures to Support National Strategies and Plans (2020-2024)

Programmes supporting national strategies & plans	National Strategy/ Plan	2020/21	2021/22	2022/23	2023/24	2024/25
Artisan programme	NDP 2030, NSDP, ERRP	652	526	670	1101	1314
Artisan recognition of prior learning (ARPL)	NDP 2030, NSDP & ERRP	32	127	63	109	76
Artisan aides programme	NDP 2030, NSDP, & ERRP	171	327	446	332	297
Learnerships (Employed)	NDP 2030, NSDP, ERRP, & HRDSA	350	351	246	478	618
Learnerships (Unemployed)	NDP 2030, NSDP, ERRP, & HRDSA	516	903	1620	1406	1725
Employees completing RPL for learnership	NDP 2030, NSDP, ERRP, & HRDSA	24	33	51	43	28
OHS Representative Development and Other MQA approved Skills Programmes	NDP 2030, NSDP, & OHSA	2877	4318	3972	4267	3969
Completed AET and NATED courses	NDP 2030, & ERRP, SDA	1250	1499	1661	1455	1927
FLC	NDP 2030, NSDP, ERRP, SDA	116	218	289	241	233
Internship	NDP 2030, NSDP, ERRP, & HRDSA	103	-	-	588	634

Programmes supporting national strategies & plans	National Strategy/ Plan	2020/21	2021/22	2022/23	2023/24	2024/25
Work-place experience Undergraduates	NDP 2030, NSDP, ERRP, & HRDSA	411	471	562	618	623
Work-place experience TVET NCV	NDP 2030, NSDP, ERRP, & HRDSA	73	216	281	334	405
Management development	NDP 2030, NSDP, HRDSA	77	130	137	197	183
Lecture development (University lecturers)	NDP 2030, NSDP, HRDSA	-	20	41	6	11
Lecture development (TVET lecturers)	NDP 2030, NSDP, & HRDSA	_	_	40	52	90
Candidacy for HDSAs	NDP 2030, NSDP, ERRP, & HRDSA, Mining Charter 2018	_	26	52	96	130
Work-place coaching	NDP 2030, NSDP, ERRP, & HRDSA	_	100	118	144	151
Bursaries Unemployed	NDP 2030, NSDP, ERRP, & HRDSA	242	362	407	601	712
Bursaries Employed	NDP 2030, NSDP, ERRP, & HRDSA	38	55	61	111	27
Mine community training development	NDP 2030, NSDP, HRDSA, & Mining Charter 2018	1 030	3515	2964	4692	860
Unemployed youth Development	NDP 2030, NSDP, & ERRP	1 182	3505	1755	2144	2816
Small business scale mining training	NDP 2030, NSDP, ERRP, & ASM Policy	100	283	237	223	302
Career guidance	NDP 2030, NSDP, &ERRP,	105	128	119	168	176
Capacity building workshops on career development	NDP, NSDP, & HRDSA	_	_	_	5	29
Entrepreneurial skills training	NDP, NSDP, HRDSA, & NGP	_	_	_	50	60
Cooperatives funded for skills that enhance enterprise growth and development	NDP, NSDP, HRDSA, & NGP	_	_	5	5	9
Small businesses funded for skills that enhance growth and development	NDP, NSDP, HRDSA, & NGP	_	_	7	7	35
CBOs/NGOs/ NPOs funded for skills	NDP, NSDP, & HRDSA	_	_	5	5	10

Programmes supporting national strategies & plans	National Strategy/ Plan	2020/21	2021/22	2022/23	2023/24	2024/25
that enhance the development and sustainability of their organization activities						
Federations /Trade Unions supported through the relevant skills training interventions	NDP, NSDP, & HRDSA	–	–	–	5	5
Annual International Literacy Day hosted	NDP, NSDP, & HRDSA	1	1	1	1	1
Training providers quality assured	NDP 2030, NSDP, & ERRP	124	212	180	159	182
Number of reviewed or developed learning programmes / assessment toolkits / learning materials (packs or modules) for the MMS	NDP 2030, NSDP, & ERRP	79	138	152	171	204
Number of HDSA supported on primary accreditation as training providers for entry into the MMS	NDP 2030, NSDP, ERRP, HRDSA, &Mining Charter 2018	8	5	4	5	5
Total Learners		**9560**	**17468**	**16146**	**19819**	**17785**
Year-on-year difference (%)		**3%**	**45%**	**-8%**	**19%**	**-10%**

Source: Audited MQA APR 2024/25

Overall, the majority of MQA projects yielded positive outcomes. A total of 1,725 unemployed learners successfully finished the learnership programme, surpassing the target of 1,000. This achievement was attributed to a strong flow of learners completing the program. When comparing 2023/24 and 2024/25, there was a 23% increase in the proportion of unemployed learners who completed the learnership programme. A total of 623 university students completed their Work Integrated Learning placements, exceeding the target of 550. In comparing the financial years 2023/24 to 2024/25, there was a 1% rise in the percentage of university students who finished their Work Integrated Learning placements. 405 TVET students completed their Work Integrated Learning placements, surpassing the target of 200. Comparing 2023/24 and 2024/25, there was a 21% increase in the number of TVET students who completed their Work Integrated Learning placements. This increase can be attributed to the discretionary grants provided by the MQA to cover stipends for learners and training costs. This financial support incentivizes mining employers to host more learners for practical experience.

5.6. Plan of Action

Table 5.3. which follows delves into the MQA's plan of action which tables the SETA's intent to strengthen M&E as well as improve its plan implementation.

Table 5. 3: MQA Plan of Action

Strategy for Strengthening M&E	Strategy for Improving SETA Plan Implementation
Standardize Data Collection Methods The MIS system under development will standardize data collection, enabling project leaders to submit consistent data for impact analysis. Three administrators will be appointed to input data into spreadsheets, improving the reliability of the internal database. Current data gaps exist due to discrepancies, like employer instead of learner contact details. Streamlining these discrepancies will boost efficiency and provide clearer insights into MQA programme impacts.	**Formalize Research-Planning Integration** Over the past year, the MQA has strengthened coordination between Strategic Planning and the Research Unit. Insights from the SSP, like change drivers and sector performance, inform the Strategic Planning Unit's External Environment Analysis. This analysis examines the mining sector and external political and economic factors affecting the MQA. It plays a key role in shaping the MQA's strategic direction and mandate implementation.
Expand Tracer Studies The M&E unit conducts tracer studies to assess program relevance, learner progression, and placement rates. Most learners completing learnerships, artisanships, and internships have secured permanent employment, showing positive impact. The unit exceeded its target of 15 tracer studies in five years and continues this as an annual process with ongoing impact analyses.	**Set Clear & Measurable Targets** APP: The targets are clear and measurable, using Technical Indicator Descriptions (TIDs) that specify assessment methods, verification means, reporting cycles, responsible individuals, target beneficiaries, and budgets. This makes targets both measurable and traceable. Positive stakeholder responses, such as discretionary grant applications, indicate these targets are attainable. SSP: The MQA is developing a research recommendations implementation framework to track recommendations from recent research projects. It outlines each recommendation, responsible stakeholders (lead or support roles), relevant MQA units, and initiation timeframes. Upon approval, a dashboard will be created to monitor progress, ensuring ongoing tracking of SSP-related actions.
Develop Performance Indicators The MQA uses Technical Indicator Descriptions (TIDs) to ensure value for money and effective implementation. TIDs specify the assessment method, verification means, reporting cycle, desired performance, responsible individuals, target beneficiaries, and project budgets. This makes indicators measurable and traceable, helping to assess programme success and guide decision-making.	**Strengthen Communication & Collaboration** The Strategic Planning Unit coordinates input submissions for the APP by sending reminders and providing templates to other units. It organizes strategic planning sessions where units present and review each other's plans, fostering collaborative input. This process progresses from inter-divisional sessions to CEO and board strategic planning meetings, also involving external stakeholders.
Improve Data Analysis & Reporting Managers and officials from the M&E unit attended a Power BI course where prospective tools for reporting were workshopped. This indicates a potential future direction for using visualisation tools in disseminating M&E findings.	**Develop Risk Management Plan** **For the APP:** The MQA uses a Key Risk and Mitigation Framework from its Strategic Plan to manage APP implementation risks. For example, the outcome "Ensure quality and impactful learning programmes" faces the risk of "Inadequate MQA interventions." Mitigations include: 1. Accrediting training providers 2. Reviewing/developing programmes every 3-5 years 3. Ongoing feedback from Community Expert Practitioners (CEP) 4. Continuous Quality Assurance activities **For the SSP:** Each SSP starts with a project execution plan approved by

Strategy for Strengthening M&E	Strategy for Improving SETA Plan Implementation
	MQA executives, including a risk management strategy. For the risk "Non-adherence to implementation timelines," mitigation measures include: • Expediting critical approvals • Strict monitoring of schedules • Early detection and reporting of risks • Compliance with deadlines, such as submitting credible SSPs to DHET on time
Increase Transparency & Communication Tracer study findings are shared with project owners, the ARC committee, and the board. Fraud or corruption issues follow the same path, with a register maintained and board decisions directing actions. External stakeholders receive findings immediately after verifications, documented in reports for companies and project owners. The MQA also presents M&E results at stakeholder forums, informing the SSP. Due to POPIA and issue sensitivity, findings are shared only with relevant parties, not publicly.	**Align SSP & APP Targets with Strategic Objectives** SSP and APP targets provide the Strategic Planning Unit with insights into the external and internal environment, guiding decisions to ensure successful mandate implementation. This alignment chain starts with the SSP, which informs the APP and then the Strategic Plan, preventing duplication and promoting efficient resource use.

5.7. Measures to Improve Skills Planning

This final section delves into the measures that should be initiated by the MQA in order to improve skills planning in the new 5-year planning cycle. These measures are distilled from key findings articulated in chapters 1-5 of this SSP and are unpacked further in Chapter 6, through the strategic skills priorities. The measures include:

- Attracting younger talent and promoting diversity by implementing targeted outreach, mentorship, and bursary programmes to address transformational issues in the sector. This also includes the prioritization skilling and upskilling programs for HDSAs to ensure equitable workforce participation.
- Promoting digital literacy across all occupational levels. By focusing on data analysis skills for better decision-making in the digitalised MMS.
- Develop expertise in renewable energy technologies to support the JETF and Green Hydrogen Commercialisation Strategy.
- Continue focusing on core mining operational skills such as mine management, mining engineering, and mechanical engineering.
- Support for automation-related skills such as electromechanical engineering and data analysis.
- Monitor trends suggesting decreased demand for specialized roles such as geology and chemistry and adapt accreditation pathways to keep specialized programs relevant.

5.8. Conclusion

The Chapter revealed that the MQA's current M&E system utilises various methods for programme evaluation and verification. The analysis showed that standardisation of data collection and expanding the use of tracer studies would strengthen the comprehensiveness and long-term impact assessment of MQA programmes. Developing clear performance indicators and improving data analysis capabilities would allow for more focused evaluation and data-driven decision making.

Furthermore, ensuring a stronger link between research and planning efforts could lead to the development of programmes that more effectively address identified skill gaps within the MMS. Setting clear and measurable targets within the SETA planning documents, along with a risk management plan, would allow

for better progress tracking and proactive mitigation of potential challenges. In addition, fostering enhanced communication and collaboration across different MQA units, combined with increased transparency regarding M&E findings, would promote a more cohesive and accountable approach to achieving the MQA's strategic objectives. By implementing the plan of action outlined above, the MQA can significantly strengthen its M&E function and ensure the effective implementation of its SETA plans. This will ultimately lead to a more impactful and efficient skills development support for the sector.

CHAPTER 6: STRATEGIC SKILLS PRIORITY ACTIONS

6.1. Introduction

The purpose of this chapter is to synthesise key findings from the previous chapters, consolidate them to inform key priority actions for skills development and make recommendations that are specific, manageable, achievable and realistic for the MMS.

6.2. Key Findings

Chapter 1: Sector Profile

- **Key Role Players:** Institutions or entities such as mining companies, government departments, state-owned entities, training providers, labour unions, and local communities exert a significant influence on the sector's operations, development, and regulatory framework. Of increasing focus are cross-sectoral fora on the JET, which significantly impacts skills development by requiring a broad, integrated, and forward-looking approach to education and training that aligns with emerging green industries and social equity goals.
- **Employer Profile and Labour Market Analysis:** A complex picture with declining number of employers due to a paradigm shift associated with JET and poor economic performance of various subsectors such as diamond processing and PGMs. Escalating number of retrenchments within the MMS also contributes to expanding unemployment rates. This necessitates the demand for skills investment particularly the retrenched miners and unemployed individuals.
- **Labour Market Profile:** The MMS workforce is predominantly dominated by matured individuals between the ages of 35-44 with a significant gender imbalance. low representation of people with disabilities indicates lack of inclusivity. Low representation of young people in MMS shows that there is a need to re-ignite the interest of young people in mining related qualifications. The prevalence of small mines also requires cost-effective and accessible skills development.

Chapter 2: Key Skills Change Drivers

- **The Future Landscape:** The MMS faces significant transformations driven by a number of change drivers including:
  - **Technological Innovation and Application:** Boosts efficiency and safety, creates demand for digital and technological skills, but also requires stronger collaboration between stakeholders to align training priorities with MMS needs.
  - **Support for ASM and Mineral Beneficiation:** Drives development and diversification but requires training in business, technical, financial, and sustainable practices. Boosts exports, jobs, and growth, but demands diverse expertise across processing, engineering, business, compliance, and innovation.
  - **Limited Energy Supply and the Demand for Alternative Energy Sources:** Lowers costs of power disruptions, supports sustainability, but requires high investment, coordination, and new or emerging skills.
  - **Globalisation: Skills Development in a Changing World:** US tariff-driven global trade will dampen demand, reduces exports and contract MMS subsectors such other mining, leading to reduced production and sales, job losses ultimately a poor MMS skills pipeline.
- **Policy Frameworks in the MMS:** The MQA's skills development strategy should align with national strategies and plans along with policy frameworks affecting skills demand and supply such as:

- **2024-2029 MTDP:** Develop MMS-relevant skills by supporting hydrogen economy initiatives, high-demand occupations, 4IR training, and private-sector placements, while strengthening transformation, infrastructure, and capacity in TVET, CET, and university programmes.
- **HRD Strategy for SA:** Support SMME growth to expand employment, promote mining career awareness, and scale up workplace training, apprenticeships, learnerships, internships, and bursary opportunities with equitable access.
- **Critical Minerals Strategy of SA:** Anticipate emerging skills needs from new technologies and environmental demands, conduct skills gap analyses, and partner with SETAs, universities, and industry to develop targeted interventions in beneficiation, melting, and advanced mineral processing.
- **Master Skills Plan of SA:** Integrate digital skills into training, partnerships to address scarce and critical skills, reskill for green and sustainable mining, and enhance artisanal and small-scale mining (ASM) capabilities.

Chapter 3: Sectoral Skills Demand and Supply Analysis

- **Hard-to-fill Vacancies and Skills Gaps:** Mine Manager, Mechanical Engineer, Mining Engineer, Engineering Manager, Mine Production Supervisor, Mining Technician, Diesel Mechanic, and Miner remain hard to fill with some having skills gaps due to:
  - Individual factors: Limited qualifications/experience.
  - Organisational factors: Equity pressures and low pay.
- **Emerging Occupations in the MMS**: Due to technological advancement and application as well as the nascent hydrogen economy, the MMS is projected to increasingly demand emerging occupations in data management as well as hydrogen production, storage, and transportation.
- **Supply-Side Analysis:**
  - **Basic Education:** Better gateway subject performance not translating into tertiary enrolments.
  - **Higher Education:** Low uptake and throughput of MMS qualifications.
  - **Industry Skills Supply:** Despite bursaries in Electrical Engineering, Mining Engineering still reports skills gaps; linked to graduate attrition to other sectors and limited qualifications/experience**.**

Chapter 4: MQA Partnerships

- **The MQA's partnership framework fosters a responsive and future-ready skills ecosystem for the MMS. Partnerships (strategic and special, education and training delivery as well as industry and professional bodies partnerships) ensure an adaptable workforce, strengthens competitiveness, supports sustainable development, and drives inclusive growth in the MMS through:**
  - **Bridging current and future skills gaps:** Through collaboration with education, research, and industry.
  - **Advancing specialised skills:** In AI, geospatial intelligence, green technologies, and other emerging areas.
  - **Promoting inclusivity and resilience:** Via reskilling for NEETs, ex-mineworkers, and small-scale mining entrepreneurs.
  - **Leveraging innovation and global best practice:** Including cross-SETA initiatives, partnerships with the CSIR and the Mandela Mining Precinct for just energy transition preparedness.

Chapter 5: Monitoring and Evaluation

- **SETA Skills Planning Reflections:** Improvements in M&E over the past five years include the fortification of the Risk sub-unit, the conscientisation of MQA staff as practitioners of M&E and the adoption of virtual learner verification methods.
- **The MQA's Approach to Monitoring and Evaluation:** M&E data guides strategic planning and resource allocation for maximum sector impact; tracking progress to optimise project management to ensure successful outcomes; and conducting impact and tracer studies to evaluate the effectiveness of training programmes on beneficiaries.
- **Status on the Implementation of Interventions and measures in support of National Strategies and Plans:** The MQA exceeded targets across learnerships and WIL placements (University and TVET), with strong year-on-year growth driven by financial support that incentivised employer participation.
- **The plan of action to strengthen MQA's M&E system includes the continued application of the following mechanisms:**
    - **Standardising data collection, expanding tracer studies, and improving performance indicators and data analysis**: Leading to increasingly focused, evidence-based decisions.
    - **Stronger links between research and planning, alongside clear targets, risk management, and transparent reporting:** For improved accountability and alignment with strategic goals.
    - **Enhanced collaboration across units:** To ensure increasingly impactful skills development support for the MMS.

6.3. Strategic Priority Actions

The MQA has maintained consistent strategic priorities for the past five years, focusing on key areas such as transformation, health and safety, technology, and environmental sustainability in the MMS. While its core mission has remained steady, the MQA has adapted by implementing a strong M&E framework and introducing new initiatives. These include targeted support for historically disadvantaged individuals, research on green and 4IR skills, and programs to assist small businesses. Building upon the successes and lessons learned from the previous planning cycle, the MQA has developed a new set of strategic priorities for the next planning cycle (2025-2030). These priorities are aligned with the evolving needs of the MMS, informed by two of the three strategic priorities of the MTDP, i.e., inclusive growth & job creation, reducing poverty and tackling the high cost of living. The planned key strategic skills priorities include:

Priority Action 1: Strengthen the strategic partnership with the DMPR to enhance collaboration on the compliance of the submission of WSP-ATRs, integrate IDPs and Social Labour Plans into the DDM, implement skills development programmes, launch targeted programmes to improve Certificates of Competency (COC) pass rates, and drive transformation in the sector

- Collaborate with the DMPR to ensure that companies adhere to the Mineral and Petroleum Resources Development Act (MPDRA), which mandates the submission of Social and Labour Plans (SLPs) and compliance with the Mining Health and Safety Act (MHSA), including the submission of WSP-ATRs, as prerequisites for obtaining, renewing, or retaining mining permits.

- Facilitate roadshows featuring senior leadership and management to emphasise the strategic significance of WSPs-ATRs and the importance of their submission. These roadshows can also serve as a platform for engaging stakeholders on other MQA programmes and fostering collaboration TVETs and CETs, as well as work-integrated learning (WIL) initiatives.

- Advocacy and lobbying in various platforms such as the Mining Indaba. Secure a slot in the CEO Forum meeting to discuss critical issues such as WSP-ATRs, graduate employment, and WIL, ensuring that skills development remains a central focus in high-level discussions within the sector.

Priority Action 2: Leverage and enhance existing partnerships to deliver skills development through the implementation of SIHIPs, directly contributing to MTDP priorities of employment growth (Outcome 2), responsive skills systems (Outcome 5), and improved public sector governance (Outcome 7)

During the upcoming mid-term planning cycle, all SETAs are expected to execute six impactful programmes in a coordinated manner and the MQA will:

- **Develop a stakeholder matrix to systematically categorize role players (primary, secondary, tertiary) by their responsibilities, forging high impact and targeted partnerships that maximize impact in skills development, education, and labour absorption.**
- Consider mainstreaming its Partnership Management Framework into its operational processes. This include ensuring that the partnership has clearly defined the nature, scope, goals, objectives, and indicators of success and desired outcomes.
- Engage all partners in collaborative planning processes to develop action plans, timelines, and milestones for implementation. This collaborative approach ensures buy-in, commitment, and ownership of the implementation process.
- Allocate sufficient resources, including infrastructure, financial, human, and technical resources, to support the implementation of each partnership.
- Implement robust M&E mechanisms to track progress, measure outcomes, and identify areas for improvement. This regular monitoring allows partners to assess performance, identify successes and challenges, and make informed decisions to enhance implementation effectiveness.
- Collaborate with other SETAs to co-implement SIHIP programmes via resource-sharing, aligned projects, and joint advocacy, ensuring a coordinated approach to sector-wide skills development priorities.
    - Create a standardised cross-SETA working model to implement SIHP programmes, targeting rural development, institutional capacity (Hydrogen Centre), graduate employment, SMME growth, and digital advancement through shared resources and accountability frameworks.
- Collaborate with other SETAs to implement integrated ICT solutions featuring a standardised learner management system and centralised WSP-ATR reporting platform, enhancing efficiency in skills development monitoring and compliance reporting.

Priority Action 3: Leverage the Special Projects framework to reconfigure the support of SMMEs including the ASM to go beyond the surface level skills development initiatives to include facilitating access to funding from development finance institutions such as DBSA and IDT, infrastructure support and meaningful mentoring

To address poverty and high living costs, aligning with the MTDP's second strategic priority, the MQA should amend its funding policy to provide infrastructure funding and capacity building for small business development (including market access, taxation, and licensing for artisanal and small-scale miners), while also engaging development finance institutions such as IDC to increase support for mining enterprises with job creation potential.

Priority Action 4: Continue supporting interventions to improve mine health and safety through targeted skills development and increasing the number of safety officers in the MMS. This includes forging partnerships with mines such as Sibanye to share insights on how to address occupational health and safety (OHS)

The mining fatalities occur due to various factors, and understanding these causes is crucial for implementing preventive measures and improving safety standards in the MMS. Among others, there is a need to:

- Increase the number of safety officers in the MMS. Address the imbalance between safety representatives and officers in the MMS by implementing a targeted progression pathway. This should include specialised training programmes in risk assessment, incident investigation, regulatory compliance, and emergency response (aligned with MHSA requirements) to equip safety representatives with the skills needed to advance into officer roles, thereby strengthening the overall safety workforce capacity.
    - Work with MHSC and Mineral Council Mosh to see how we can contribute towards the FOGAP. To address the challenge of having more safety representatives than safety officers in the MMS, a focus on skills development is crucial. Strategies include developing specialised training programmes aimed at equipping safety representatives with additional skills and knowledge to perform tasks traditionally handled by safety officers.
    - Partner with educational institutions or accredited bodies to design certification programmes tailored to the needs of safety representatives to articulate into the safety officer programme.
    - Establish mentorship programmes to pair safety representatives with safety officers for guidance, support, and acquisition of practical knowledge. These mentoring relationships can facilitate knowledge transfer and professional development, on-the-job training, continuing education, and performance.
- Conduct a vigorous analysis of the causes of the fatalities in the MMS (human, behavioural- due to “planisa”, Fall of Ground Action Plan (FOGAP), heavy equipment and machinery, seismicity, natural disaster such as floods) and then ensure that appropriate interventions to effect transformation.
    - Conduct ethnographic and phenomenological studies to better understand the underlying reasons why fatalities persist in the sector.

Priority Action 5: Heighten collaboration with mine training centres and service providers to gain an informed understanding of their skills needs and develop fit-for-purpose solutions that align precisely with emerging technological requirements in the MMS

The MQA will prioritise integrating digital literacy, data analytics, and renewable energy skills across its programmes by collaborating with other SETAs to leverage existing curricula and partnering with research institutions such as the Mandela Mining Precinct to identify emerging skill needs. This initiative, aligned with SIHIPs focus on holistic digitisation and technological advancement, will develop both unit standards-aligned and flexible training programmes—including green skills—to future-proof the mining workforce.

Priority Action 6: Implement skills development support for ex-mine workers as well targeted interventions for the NEET population, ensuring their participation in mainstream economic activities and addressing both skills and employability needs

The MQA will develop a cogent support plan targeting two critical groups:

- **Ex-mineworkers**, through a portable skills framework, business/financial training, and job placement networks with MMS partners to facilitate transitions into new roles within and beyond mining; and
- **NEETs** (youth and rural), by expanding access to PSET institutions, demand-driven skills programmes, and

work-integrated learning (learnerships, apprenticeships) with mining and related industries—enhancing employability while addressing sectoral skills gaps.

Priority Action 7: Conduct a study aimed at evaluating the MQA's programme performance against three key criteria: objective attainment (effectiveness), resource optimisation (efficiency), and impact generation (efficacy), ensuring evidence-based continuous improvement

This evaluation framework will generate critical insights by: (1) measuring the achievement of intended outcomes (skills improvement, employability, and job performance); (2) enabling quality improvement through systematic identification of programme strengths and weaknesses; and (3) establishing evidence-based decision-making processes using empirical data to guide programme design, resource allocation, and strategic direction.

Priority Action 8: Develop a formal Research Recommendations Implementation Framework to synthesize research recommendations into an actionable plan, with a monitoring system to track implementation and maximize the impact of research on sector planning

To ensure the successful implementation of research recommendations and driving meaningful change for greater impact, the MQA will strive to:

- First, rigorously align all recommendations with the organisation's strategic vision. Second, embed project managers throughout the research process - shaping the Research Agenda, validating findings, and leading its dissemination to the broader sector. Third, convene specialised implementation teams with deliberately diverse expertise. Fourth, develop granular action plans specifying tasks, deadlines, and accountable parties. Fifth, operationalise actions through phased execution of prioritised workstreams. Sixth, institute robust M&E systems measuring responsiveness, relevance, and sustainability through impact studies - ensuring research continuously elevates sector planning quality.

6.4. Conclusion

This chapter synthesises the key findings from the preceding analysis to present a set of strategic priority actions for the MMS. The preceding chapters have laid bare the sector's complex challenges, from a declining employer base and an ageing, imbalanced workforce to persistent skills gaps and the rising forces of technology and a volatile global market. In response to these dynamics, this SSP consolidates its insights into a clear and actionable roadmap, ensuring the MQA's interventions are targeted, impactful, and aligned with national priorities.

The eight strategic priority actions outlined in this chapter represent the MQA's commitment to building a more inclusive, resilient, and future-proof mining workforce. Crucially, these priorities are designed to be synergistic, leveraging partnerships to integrate emerging skills—such as those related to digitalisation and green technologies—and ensuring research findings translate into tangible actions. This holistic approach, aligned with national frameworks such as the the Medium-Term Development Plan and the Human Resources Development Strategy for South Africa, marks a deliberate move to transition from a reactive model to a strategic one. It is a bold declaration of the MQA's commitment to creating a skilled workforce that can drive sustainable growth, foster inclusive employment, and secure the long-term viability of the MMS.

References

Creamer, M. 2024. South Africa's small-end diamond producers are battling to survive, Sadpo reports. Creamer Media's Mining Weekly. Available from: https://www.miningweekly.com/article/south-africas-small-end-diamond-producers-are-battling-to-survive-sadpo-reports-2024-08-22 [Date accessed: 21 August 2025]

Department of Basic Education. 2021. About DBE. Available from https://www.education.gov.za/AboutUs/AboutDBE.aspx [Date accessed: 04 May 2025]

Department of Basic Education. 2024. 2023 NSC Exam Results Technical Report. Available from https://www.education.gov.za/Portals/0/Documents/Reports/2021NSCReports/NSC23%20Technical%20Report.pdf?ver=2024-01-18-161615-123 [Date accessed: 13 June 2025]

Department of Higher Education and Training. 2013. Guidelines: Organising Framework For Occupations (OFO). Available from: https://www.dhet.gov.za/Publications/OFO%20Guideline%20-%202013.pdf [Date accessed: 24 February 2025]

Department of Higher Education and Training. 2022. Skills Supply and Demand in South Africa – 2022. Available from: https://lmi-research.org.za/publication/skills-supply-and-demand-in-south-africa-2022/ [Date accessed: 24 January 2025]

Department of Higher Education and Training. 2023. Statistics on Post-School Education and Training, DHE, (2023). Available from https://www.DHE.gov.za/DHE%20Statistics%20Publication/Statistics%20on%20Post-School%20Education%20and%20Training%20in%20South%20Africa%202021.pdf [Date accessed: 19 February 2025]

Department of Higher Education and Training. 2024. 2022 Higher Education Management Information System. Available from: https://www.DHE.gov.za/SitePages/Higher-Education-Management-Information-System.aspx [Date accessed: 9 April 2025]

Department of Higher Education and Training. 2024. Identification of the Skills Needed for the Hydrogen Economy. Available from https://www.DHE.gov.za/Planning%20Monitoring%20and%20Evaluation%20Coordination/Identification%20of%20Skills%20Needed%20for%20the%20Hydrogen%20Economy-Report-April-2024.pdf [Date accessed: 25 June 2025]

Department of Mineral and Petroleum Resources. 2025. Mineral Economics and Statistics. Mineral Economics Bulletin. 6(4), 1-39

Dunne, P. 2025. Welcome speech for State of the Mining Nation media briefing – 3 February 2025.

Frey, C., & Osborne, M. 2013. The Future of Employment. How Susceptible Are Jobs to Computerization? Working Paper, Oxford: Oxford Martin.

Human Science Research Council. 2021. South African Mining Sector Employment Forecast to 2025. Downloaded from:

https://www.gtac.gov.za/wp-content/uploads/2022/02/South-African-Mining-Sector-Forecast-to-2025.pdf [Accessed date: 9 May 2025]

Independent Online (IOL). 2025. South Africa braces for impact as 30% US tariffs take effect. Available from: https://iol.co.za/business-report/economy/2025-08-07-south-africa-braces-for-impact-as-30-us-tariffs-take-effect/ [Accessed date: 3 August 2025]

Landiswa, S., Pierre, J. & Manilall, D. 2019. Employees' Perceptions of the Effects of Retrenchment on Job Stress and Organisational Commitment in a Mining Company. African Journal of Employee Relations.

McBride, B. 2022. Lacklustre interest among youth a big problem for mining. Available from: https://www.mining.com/lacklustre-interest-among-youth-a-big-problem-for-mining/ [Date accessed: 29 July 2025]

Maphosa, J. 2023. The Disability and Reasonable Accommodation Toolkit: A Roadmap to Inclusion in the Mining Sector. This Ability. A disability Awareness Newspaper. Available from: https://www.thisability.co.za/2023/12/14/review-ensuring-accessibility-and-inclusion-in-the-mining-industry/ [Date accessed: 10 August 2025]

Mohlakoana, N., Rathupetsane, A., Molope, B. & Jacob, M. 2024. Demistifying employment in South Africa's Just Energy Transition: Exploring emerging decent work themes. Development Southern Africa. 41. 1-17.

Metcaife, J., Le Riche, B. & McKay, J. 2020. Unlocking South Africa's hydrogen potential, Johannesburg: PwC.

Masuku, B. 2023. Skills development in mining – a solution to a changing industry. The Southern African Institute of Mining and Metallurgy. Available from: https://www.mineralscouncil.org.za [Date accessed 24 March 2025].

Minerals Council South Africa. 2025. Available at: https://www.mineralscouncil.org.za [Accessed date: 24 March 2025].

Minerals Council South Africa. 2025a. Collaboration reduces constraints on mining in 2024 but more progress is needed for the industry to reach its true potential. Cape Town: Minerals Council South Africa. Available at: https://www.mineralscouncil.org.za/industry-news/publications/facts-and-figures [Accessed date: 24 March 2025].

Mbazima, M. 2020. Reviving a declining mining industry. Centre for Development and Enterprise. Downloaded from: https://cde.org.za/wp-content/uploads/2020/08/viewpoints-reviving-a-declining-mining-industry-norman-mbazima.pdf [Accessed date: 13 April 2025]

Minerals Council South Africa. 2025a. Facts and Figures Pocketbook 2024. [online] Minerals Council South Africa. Available at: https://www.mineralscouncil.org.za/component/jdownloads/?Itemid=119&catid=17&id=2390&m=0&task=download.send [Accessed 24 March 2025].

Minerals Council South Africa. 2025b. Minerals Council South Africa Certificates. Unpublished data.

Minerals Council South Africa. 2025c. Expected mining sector contraction in Q1 2025 will be a hit to real GDP. Available from: https://www.mineralscouncil.org.za/all-categories?task=download.send&id=2465:expected-mining-sector-contraction-in-q1-2025-will-be-a-hit-to-real-gdp&catid=134 [Date accessed: 18 August 2025]

Mining Indaba. 2024. Mining Indaba. [Online] Available at: https://miningindaba.com/Articles/platinum-boosting-clean-hydrogen-projects-pat. [Accessed date: 19 03 2024].

Mining Qualifications Authority. 2023. Investigating the Nature of Demand and Skills Supply Required with Changing Technologies in the MMS. Unpublished Report

Mining Qualification Authority. MQA. 2024a. The Nature and Extent of 4IR Innovation and Related Impact on Occupational Profiling in the Mining and Minerals Sector (MMS). Unpublished report

Mining Qualifications Authority. MQA. 2024b. Internal engagement: Monitoring and Evaluation in 2023/24.

Mining Qualifications Authority. 2024c. Mining Skills Lekgotla Report, Johannesburg: Mining Qualifications Authority.

Mining Qualification Authority. MQA. 2025a. Annual Performance Report (APR). Unpublished Report.

Mining Qualifications Authority. MQA. 2025b. DHET Registration File. Available from: https://DHEwebapps.DHE.gov.za/LevyPortal/Account/Login (Institutional login). [Date accessed: 3 July 2025].

Mining Qualifications Authority. MQA. 2025c. WSP-ATR. Unpublished data.

Mining Qualifications Authority. MQA. 2025d. Exploring beneficiation skills that can be prioritised in the Mining and minerals sector. Pretoria: Department of Higher Education and Training.

Mining Qualifications Authority. MQA. 2025e. Exploring the state and nature of the green hydrogen technology in the Mining and minerals sector. Pretoria: Department of Higher Education and Training.

Mitchell, F. 2025. Mining Production and Sales. Market Overviews. Available from: https://aluma.co.za/2025/06/13/mining-production-and-sales-2506/ [accessed date: 13 June 2025]

Mishra, G. 2025. The Mining Industry in 2025: Challenges, Innovation, and the Road Ahead. The Southern African Institute of Mining and Metallurgy. GMG-SAIMM Johannesburg Forum.

National Union of Mineworkers. 2025. NUM is deeply worried about the decision taken by Petra Diamonds to retrench over 200 mineworkers. Media Statement. Available from: https://num.org.za/news-reports-speeches/posts/num-is-deeply-worried-about-the-decision-taken-by-petra-diamonds-to-retrench-over-200-mineworkers/ [Accessed 10 May 2025]

Rossouw, A. and Khutlang, V. 2023. SA Mine 2023 – Adapt to thrive. 15th edition. PricewaterhouseCoopers. Available at: https://www.pwc.co.za/en/assets/pdf/sa-mine-2023-v3.pdf [Date accessed: 15 May 2025]

Statistics South Africa. 2025:Q1. Quarterly Labour Force Survey. Available from https://www.statssa.gov.za/publications/P0211/P02111stQuarter2025.pdf [Accessed date: 20 July 2025]

South African Government. 2024. Education. Available from https://www.gov.za/about-sa/education#:~:text=The%20mandate%20of%20the%20Department,Republic%20of%20South%20Africa%20of [Date accessed: 23 March 2025]

Statistics South Africa. Gross Domestic Product. 2025:Q1. Available from https://www.statssa.gov.za/publications/P0441/P04411stQuarter2025.pdf [Date accessed: 20 July 2025]

Statistics South Africa. 2025. Mining: Production and sales (Preliminary) February 2024. Available from: https://www.statssa.gov.za/publications/P2041/P2041February2024.pdf

Tyson, R. 2024. Navigating Skills Shortage and Skills Gap in the Mining Industry. Mining International – Discovering new talent. Available from: https://www.mining-international.org/navigating-skills-shortage-and-skills-gap-in-the-mining-industry/ [Date accessed: 17 July 2025]

Valikandi, E.M. and Choi, Y. 2024. Utilization of solar and wind power-generation systems in the mining industry: recent trends and future prospects. *Journal of Sustainable Mining*, *23*(4), pp.388-396. Available from https://jsm.gig.eu/journal-of-sustainable-mining/vol23/iss4/7/ [Accessed 19 August 2025]

Zadeh, J. 2025. South Africa's Mining Production Decreases 7.7% in April 2025. Discovery Alert. Available from: https://discoveryalert.com.au/news/mining-production-decline-south-africa-2025/ [Date accessed: 16 June 2025