MICTSETA | Media, Information And Communication Technologies Sector Education And Training Authority

SHAPING SKILLS, PIONEERING INDUSTRIES, EMPOWERING FUTURES

FEASIBILITY STUDY FOR ARTISANAL PROGRAMMES IN THE MICT SECTOR

DRAFT RESEARCH REPORT

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ACRONYMS AND ABBREVIATIONS

A21	Apprenticeship of the 21st Century	**NADAB**	National Artisan Development Advisory Body
ACASA	Association for Communication and Advertising South Africa	**NADSC**	National Artisan Development Support Centre
ADTTT	Artisan Development Technical Task Team	**NAMB**	National Artisan Moderation Body
AI	Artificial Intelligence	**NATED**	National Technical Education
ARPL	Artisan Recognition of Prior Learning	**NC(V)**	National Certificate (Vocational)
CHIETA	Chemical Industries Education and Training Authority	**NDP**	National Development Plan
CoS	Centres of Specialisation	**NEET**	Not in Employment, Education, or Training
DCDT	Department of Communications & Digital Technologies	**NeSPA**	National e-Skills Plan of Action
DHET	Department of Higher Education and Training	**NIHRD**	National Integrated Human Resource Development
DSAP	Dual System Apprenticeship Project	**NQF**	National Qualifications Framework
EPR	Expenditure and Performance Review	**NSA**	National Skills Authority
FOSS	Free Open Access Software	**NSDS**	National Skills Development Strategy
GITOC	Government Information Technology Officers Council	**NSF**	National Skills Fund
GTAC	Government Technical Advisory Centre	**NSFAS**	National Student Financial Aid Scheme
HRD-SA	HRD strategy for South Africa	**Off-JT**	Off-the-Job Training

HRDC	Human Resource Development Council	**OJT**	On-the-Job Training
HTFVs	Hard to Fill Vacancies	**PSET**	Post-School Education and Training
ICT	Information and Communication Technologies	**QCTO**	Quality Council for Trades and Occupations
ICT SMME Chamber	Information and Communication Technologies SMME Chamber	**RPL**	Recognition of Prior Learning
ICTVs	ICT Ventures	**SAQA**	South African Qualifications Authority
IFR	International Federation of Robotics	**SDA**	Skills Development Act
IITPSA	Institute of Information Technology Professionals South Africa	**SDL**	Skills Development Levy
IPP	Industry Professional Practice	**SETA**	Sector Education Training Authorities
ITA	Information Technology Association	**SITA**	State Information Technology Agency
JIPSA	Joint Initiative for Priority Skills Acquisition	**SMEs**	Small and Medium Enterprises
MDDA	Media Development and Diversity Agency	**SSACI**	Swiss South African Cooperation Initiative
MICT SETA	The Media, Information, and Communication Technologies Sector Education and Training Authority	**TIA**	Technology Innovation Agency
MQA	Mining Qualifications Authority	**TVET**	Technical and Vocational Education and Training
MTSF	Medium-Term Strategic Framework	**USAASA**	Universal Service and Access Agency of South Africa
NAB	National Association of Broadcasters		

EXECUTIVE SUMMARY

The Media, Information and Communication Technologies Sector Education and Training Authority (MICT SETA) commissioned research into the feasibility of supporting artisan programs to address specific sector needs and opportunities. The study seeks to gauge the interest and need for artisan programs among employers and other stakeholders in the MICT sector. This includes understanding the specific types of artisan skills that are in demand and the extent of this demand. The study also aims to identify existing occupational qualifications associated with trades relevant to the MICT sector and determine if new or additional qualifications need to be developed.

The findings of the study are based on desktop research which encompassed a thorough policy analysis of artisan development, an examination of various types of artisan development programs, and a review of successful artisan development initiatives. The research also included an international comparative analysis of artisan development in Germany and South Korea. It also involved a review of occupational qualifications associated with trades in the MICT sector to assess their suitability for implementation as apprenticeships. Additionally, the research team analysed Workplace Skills Plan (WSP) and Annual Training Reports (ATRs) data from the MICT SETA for the 2022-23 period. This data, collected annually from MICT SETA employers, provided insights into various workforce aspects, including employee demographics, occupations, hard-to-fill vacancies, skills gaps, and training initiatives.

An electronic survey, utilising SurveyMonkey, was distributed to all employers within the MICT SETA database. The survey comprised 25 questions and was sent to 2,187 contacts, of which 1,015 emails bounced (45.4%). The bounce rate increased with each subsequent reminder. Out of the 1,172 emails successfully delivered, 634 remained unopened (54.1%). From the 538 opened emails, 93 responses were received after five reminders. The majority of respondents represented small companies. The responses to the survey are dominated by respondents from the Information Technology sub-sector.

The researchers also conducted semi-structured interviews with twelve industry representatives within the MICT sector and engaged with a sample of employers in the MICT sector through two focus group discussions. To further enrich the understanding of artisan development within the MICT sector, two mini case studies

were conducted, each involving in-depth interviews with a training manager and an apprentice within two different companies.

The study started with an international review with a focus on Germany and South Korea. In the domain of Information and Communication Technology (ICT) apprenticeships in Germany, dual IT apprenticeships are held in high regard due to their practical and comprehensive nature of learning within the information technology field. With a strong emphasis on practical training, dual IT apprenticeships in Germany lay a solid foundation for success.

The South Korean government has placed significant emphasis on the apprenticeship system to enhance youth employment opportunities and to create a seamless connection between skills development and skills application.

South Korean apprentices have traditionally viewed apprenticeship as a means for job creation and subsequent employment opportunities rather than as a platform for professional development facilitated by the reciprocal interaction between a meister and an apprentice. In contrast, the German apprenticeship system mandates that apprentices undergo a comprehensive learning process spanning two to four years under the guidance of meisters, enabling them to acquire skills within a stable environment alongside other apprentices.

In South Africa, 192,369 employees are employed as skilled agricultural, forestry, fishery, craft, and related trades workers (MICT SETA WSP/ATR data, 2022/23). This represents 3% of the total workforce. The trades with the highest number of employees in the MICT sector are Data and Telecommunications Cabler; Cable Jointer; Telecommunications Line Mechanic; Computer Engineering Mechanic/Service Person; and Electrician. There is significant presence of artisans across 56 recognised trades.

The data also highlights the employment of individuals in "trade-type" occupations not currently registered as formal trades, such as Continuous Stationery Printing Machine Technician, Commercial Digital Printer, Mechanical Equipment Repairer, and Metal Fabricator. There also is a significant demand for specific artisan trades within the MICT sector, particularly in trades such as Instrument Mechanician,

Telecommunications Line Mechanic, Electro Equipment Mechanician, Business Machine Mechanic, Computer Engineering Mechanic/Service Person, and Electrician. These roles, often reported as "Hard to Fill" by employers, highlight a potential misalignment between the perceived and actual demand for artisan skills in the sector.

MICT sector employers indicated their planned training goals for their employees, many of which are planned to be trained in artisan trades. The trades with the highest number of planned traineesare Telecommunications Line Mechanic; Business Machine Mechanic; Data and Telecommunications Cabler; Computer Engineering Mechanic/Service Person; and Electrician. This distribution suggests a prioritisation of training in trades directly relevant to the MICT sector's core operations and infrastructure, particularly in computer engineering, telecommunications, and electronics. There are also occupations where training is planned, such as a Continuous Stationery Printing Machine Technician, that could lend itself to being implemented as a trade, even though it is not currently registered as a trade.

Focus group discussions and interviews highlighted a desire for the development of new qualifications that could be implemented as artisan training programs, particularly in areas such as basic network fundamentals, networking agents, field services, ICT development, and fibre optic installation and splicing. These findings suggest that the current artisan training landscape may not fully align with the evolving needs of the MICT sector employers, necessitating the development of new training pathways and qualifications to address these emerging skill requirements.

Whilst some companies are already engaged in artisan training, the scale is limited. However, stakeholders strongly agree that artisan training would increase significantly if funding and structural support were provided.

The similarities between occupational qualifications and apprenticeship training have been mentioned, emphasising the progression from knowledge to practical application and workplace learning, culminating in international certification or assessment. However, a key distinction remains: apprenticeship training prioritises workplace learning under a mentor's guidance, with work experience documented

in a logbook and culminating in a nationally recognised trade test after three to four years. While occupational qualifications offer a foundation in theoretical knowledge and practical skills, given their novel nature, stakeholders are not confident that they may fully address the specific requirements similar to artisan training in the MICT sector.

Various challenges in implementing artisan development have been identified, with the issue of funding being the biggest challenge, linked to the complex and bureaucratic nature of the funding system. Other challenges include a lack of a sufficient number of mentors, lack of required equipment and a lack of training providers. Various benefits resulting from artisan development include improved productivity, higher skills levels, improved morale, less wastage, less mistakes in the workplace, and a decrease in the need to outsource work.

Research indicates that it costs around R400 000.00 to train an artisan. Currently, the majority of companies fund artisan training from their own budgets. The financial support in the form of a legislated grant value provided for apprenticeships currently is R206,290.00 per apprentice, with additional provisions for apprentices with disabilities. A shift in funding priorities towards apprenticeship programs could potentially stimulate a significant increase in artisan training within the sector.

Stakeholders believe that artisan training would increase significantly with the provision of funding and structural support. Beyond apprenticeship grants, the MICT SETA would need to invest in advocacy, capacity building, quality assurance for existing trades, the development of new qualifications and the accreditation of providers. By focusing on both existing employees and new entrants, the MICT SETA can establish a sustainable and effective artisan development system that not only fulfills the sector's needs but also contributes to broader economic growth and development in South Africa.

Recommendations include the following:

- Integration of the findings and recommendations of this feasibility study into the MICT planning documents;

- To implement artisan development programmes in phases, starting with conservative targets and budgets to assess stakeholder appetite and gradually scaling up as capacity and demand increase.
- The Discretionary Grant Funding Policy should be amended to explicitly include funding for artisan training.
- Policies for apprentice contracting, workplace approval for artisan training, employer guidelines, quality assurance, and mentorship should be developed.
- A comprehensive advocacy campaign should be initiated to communicate the availability of grants and the benefits of artisan development to MICT SETA stakeholders.
- Capacity building programmes for employers and for mentors should be developed and implemented.
- Stakeholder meetings to explore the implementation of existing occupational qualifications as trades and to refine the need for and content of new qualifications, ensuring diverse representation and input from relevant stakeholders, should be arranged.
- A comprehensive national footprint of theoretical and practical providers of artisan training, and collaborate with other SETAs to address any gaps in coverage.
- The development of new qualifications should pro-actively be communicated to potential providers and guidance and support offered to facilitate their accreditation process, ensuring a sufficient pool of qualified training providers.
- MICT SETA should also invest in the development of external integrated summative assessments (EISAs) to ensure a standardized and rigorous evaluation of apprentice competencies, aligning with the requirements of the QCTO and industry standards.

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1 INTRODUCTION

This feasibility study examines the demand for artisan programs within the Media, Information, and Communication Technologies (MICT) sector and offers practical recommendations for their implementation. The study was commissioned in response to stakeholder requests for the MICT Sector Education and Training Authority (SETA) to consider supporting artisan programs to address specific sector needs and opportunities. The sector is experiencing a skills gap, particularly in specialised technical areas, and industry stakeholders have identified supporting artisan programs as a potential solution.

Artisans generally possess a skill level that extends beyond task execution to a deep understanding of how tasks interconnect within a broader process. They not only perform individual steps but also comprehend the overall system and their role within it. Developing artisan skills requires a multifaceted approach that combines formal theoretical knowledge with hands-on practical training and real-world work experience.

The MICT sector recognises the need for a diverse and inclusive workforce . Artisan programs are seen as a way to attract individuals from various backgrounds, including those who may not have pursued traditional academic paths, thereby fostering a more inclusive industry and stimulating entrepreneurship and job creation within the sector .

2 BACKGROUND

The Department of Higher Education and Training (DHET) guides artisan development through a policy and legislative framework, including the Skills Development Act (SDA), National Skills Development Plan (NSDP), White Paper for Post-School Education and Training (WP-PSET), National Development Plan (NDP), and the National Artisan Development Strategy and Implementation Plan. The SDA outlines the objectives and functions of skills development within the DHET, while the legislative framework provides various pathways for learning trades, meeting national standards, and undergoing trade testing. These pathways include apprenticeships, learnerships, the NCV(4) to artisan pathway in public TVET colleges, and Artisan Recognition of Prior

Learning (APRL). The National Artisan Development Advisory Body (NADAB) oversees these provisions.

Following a decline in artisan numbers nationwide, the establishment of the National Artisan Moderation Body (NAMB) in 2010 initiated the rebuilding of the national artisan development system. A seven-step process to becoming an artisan was defined, encompassing traditional NATED certificates, relevant engineering NCV Certificates at NQF level 3, a technical Grade 11 with specified subjects, and the relevant N6 certificate or National Technical Diploma. The process emphasises the practical application of theoretical knowledge in a training centre, along with workplace learning and trade testing. Colleges, in partnership with SETAs, have contributed to this revitalisation.

Despite these efforts, many stakeholders perceive a shortage of artisans in the country. The current NSDP acknowledges this critical shortage and the need to understand the factors that attract and retain artisans. As generic retention strategies have proven ineffective, alternative approaches are sought. The plan stresses the importance of continuous curriculum transformation, particularly within TVET colleges, to produce skilled artisans, technologists, and technicians vital to the economy.

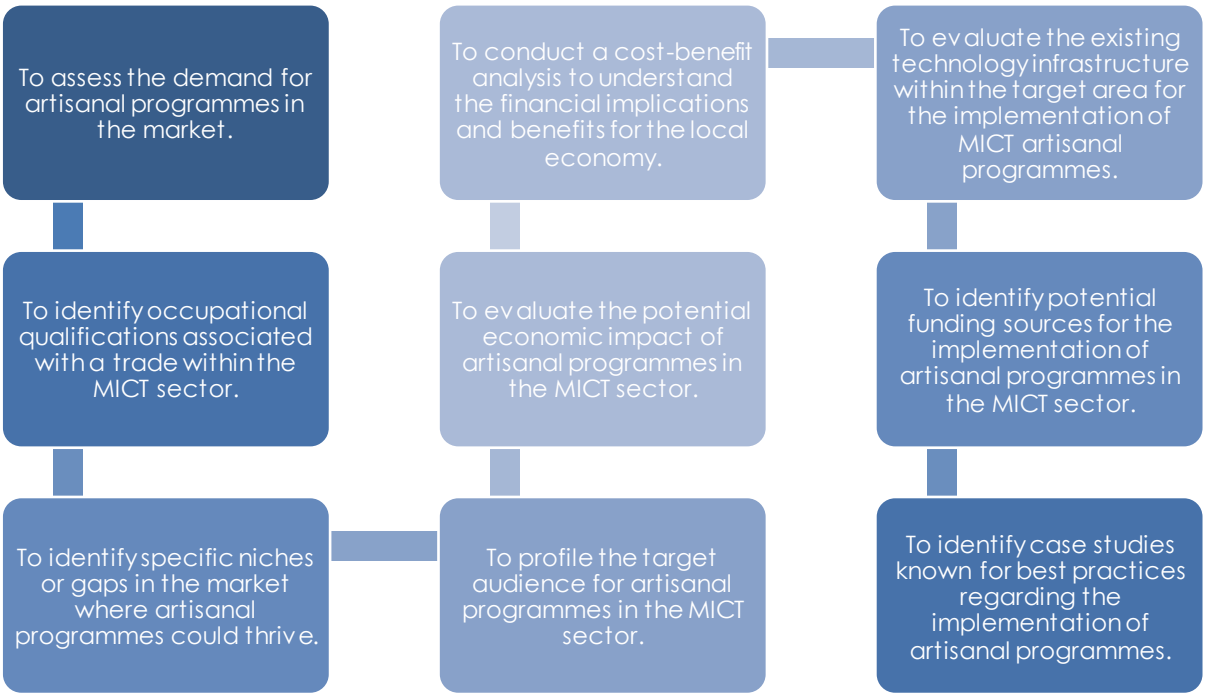
2.1 Project Objectives

The feasibility study primarily aims to assess the demand for and viability of implementing artisanal programs within the MICT sector. The study seeks to gauge the interest and need for artisan programs among employers and other stakeholders in the MICT sector. This includes understanding the specific types of artisan skills that are in demand and the extent of this demand. The study also aims to identify existing occupational qualifications associated with trades relevant to the MICT sector and determine if new or additional trades need to be developed. Moreover, the study seeks to pinpoint specific areas within the MICT sector where artisan programmes could be particularly successful. This involves analysing market trends, skills gaps, and potential growth areas.

Understanding the target audience for artisan programmes is crucial for tailoring the programmes to meet their needs and aspirations. This includes identifying the demographics, educational backgrounds, and career goals of potential participants. In this regard, the study aims to assess the potential economic impact of artisan

programs on the MICT sector and the broader economy. This includes analysing the potential for job creation, skills enhancement, and increased productivity. Understanding the financial implications of implementing artisan programs is essential for decision-making. The study will conduct a cost-benefit analysis to weigh the costs of training and infrastructure against the potential benefits to the sector and the economy. Assessing the existing technology infrastructure is crucial for determining the feasibility of implementing MICT artisanal programs. This includes evaluating the availability of equipment, software, and internet connectivity in the target areas. The study aims to identify potential funding sources for the implementation of artisan programs. This could include government grants, industry contributions, and other financial mechanisms.

In summary, the project objectives include the following:



2.2 Research Questions

The key research questions and sub-questions for this study included:

Is there a demand for artisanal programmes amongst employers and other industry and employee representatives in the MICT sector?

a. Is the demand for existing trade qualifications (apprenticeships), or is there a need for the development of additional and new trades?
b. What is the extent of the demand?
c. Where could artisanal programmes thrive within the MICT sector?
    i. What is the extent of existing technology infrastructure within the target area for the implementation of MICT artisanal programmes?
d. Who would be the target audience for artisanal programmes within the MICT sector?

2. Are there occupational qualifications associated with a trade relevant to the MICT sector?
    a. What are they?
3. What is the potential economic impact of artisanal programmes within the MICT sector?
    a. What are the potential benefits of artisanal programmes in the MICT sector?
    b. What are the potential costs of artisanal programmes in the MICT sector?
    c. Are there potential funding sources for the implementation of artisanal programmes in the MICT sector?

3 METHODOLOGY

This feasibility study employed a mixed-methods approach, incorporating both quantitative and qualitative methodologies. Quantitative methods encompassed data analysis and an online survey, while qualitative methods included document analysis, literature review, and semi-structured interviews and focus groups with employers and broader sector stakeholders.

The document analysis involved a thorough review and analysis of MICT SETA historical performance reports and planning documents, as well as other relevant MICT and sector reports. Additionally, a comprehensive literature review was conducted on artisan development, encompassing national plans, grey literature, and academic sources such as Cresswell. Cresswell's work provided valuable guidance on methodological considerations for the study.

To ensure relevance, coverage and representivity, the research team adhered to sampling guidelines provided by the MICT SETA, striving to cover all sub-sectors within the industry . The research process was structured into six distinct stages, each comprising multiple tasks and activities to systematically address the research questions and objectives. A six-stage research process was implemented, with each stage consisting of multiple tasks and activities.

3.1 Desktop Research

A comprehensive desktop research phase was conducted to investigate artisanal programs. This encompassed a thorough policy analysis of artisan development, an examination of various types of artisan development programs, and a review of successful artisan development initiatives. The research also included an international comparative analysis of artisan development in Germany and South Korea.

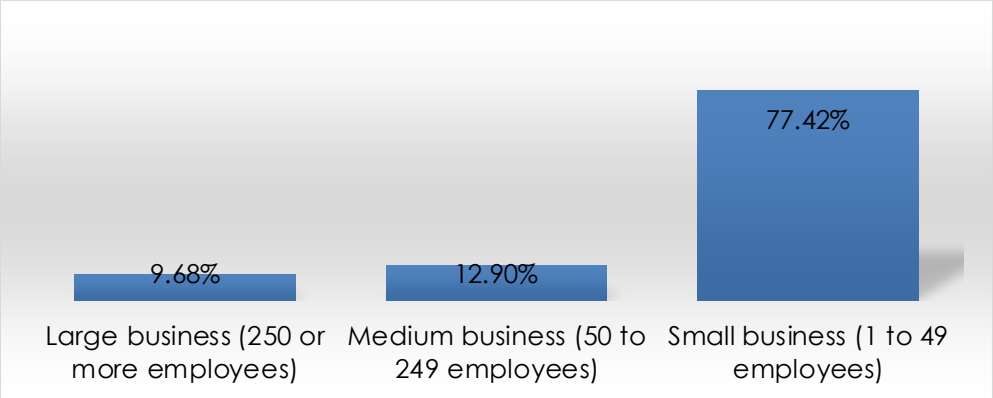
Furthermore, the desktop research involved a review of occupational qualifications associated with trades in the MICT sector to assess their suitability for implementation as apprenticeships. Additionally, the research team analysed Workplace Skills Plan (WSP) and Annual Training Reports (ATRs) data from the MICT SETA for the 2022-23 period. This data, collected annually from MICT SETA employers, provided insights into various workforce aspects, including employee demographics, occupations, hard-to-fill vacancies, skills gaps, and training initiatives.

3.2 Employer Survey

An electronic survey, utilising SurveyMonkey, was distributed to all employers within the MICT SETA database. The survey comprised 25 questions and was sent to 2,187 contacts, of which 1,015 emails bounced (45.4%). The bounce rate increased with each subsequent reminder. Out of the 1,172 emails successfully delivered, 634 remained unopened (54.1%). From the 538 opened emails, 93 responses were

received after five reminders. The majority of respondents represented small companies.

Figure 1: Company size of survey respondents

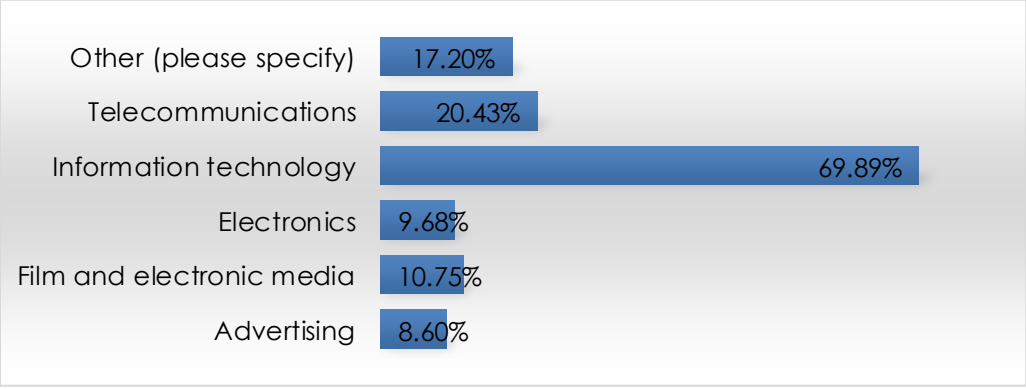


Source: MICT SETA Survey, 2024

This distribution suggests that small businesses are the predominant respondents within the surveyed sector. It also indicates that the findings and implications of the study are likely to be most relevant to smaller organisations, even though there are some large employers with many employees who participated. This is important to consider when interpreting the survey results, as the needs and challenges of small businesses may differ significantly from those of larger enterprises.

Furthermore, the significant representation of small businesses highlights the importance of tailoring artisan development programs to meet their specific needs and constraints. For instance, smaller businesses may require more flexible and affordable training options, as well as support in navigating the administrative and financial aspects of apprenticeship programs.

Figure 2: Survey respondents per sub-sector



Source: MICT SETA Survey, 2024

The responses to the survey are dominated by respondents from the Information Technology sub-sector, as can be seen in Figure 2. This distribution suggests that Information Technology is the dominant sub-sector within the MICT sector, at least among the survey respondents. This could imply that artisan development programs within the MICT sector may need to focus on skills relevant to IT to address the largest workforce segment. It must be noted that 17,2% of respondents selected "other", indicating that they do not belong to any of the five sub-sectors of the MICT SETA. The "Other" category also holds a significant portion, indicating potential for diverse, niche specialisations within the sector that could benefit from artisan training.

Some of these organisations indicated that their business focus was "public relations and communication management; research; power generation; agricultural economics; government and banking law firms; and packaging". It is possible that these companies fall within the scope of another SETA and that some of the skills needs identified in the section below, for example, "poultry slaughterer" and "roof tiler", do not seem to logically fall under the MICT SETA scope of coverage.

3.2.1 Interviews

In addition to secondary data analysis and an online survey, the researchers conducted semi-structured interviews with twelve industry representatives within the MICT sector to gain further insights into the feasibility of implementing artisanal programs. These interviews, guided by a predetermined set of questions, aimed to gather qualitative data on industry perspectives, experiences, and recommendations regarding artisan development within the sector. This approach allowed for a deeper understanding of the challenges and opportunities related to artisan training, complementing the quantitative data collected through the survey and secondary sources.

3.3 Focus Groups

To supplement secondary data analysis and online surveys, the researchers engaged with a sample of employers in the MICT sector through focus group discussions. Two focus groups were conducted to gather qualitative insights and perspectives on the demand for and feasibility of implementing artisanal programs within the sector. These discussions aimed to delve deeper into the specific needs, challenges, and

opportunities related to artisan development, providing a more nuanced understanding of the issue beyond quantitative data.

3.4 Case studies

To further enrich the understanding of artisan development within the MICT sector, two mini case studies were conducted, each involving in-depth interviews with a training manager and an apprentice within two different companies. This approach allowed for a nuanced exploration of the specific experiences, challenges, and successes related to artisan training from the perspectives of both those responsible for implementing training programs and those undergoing the training itself. These case studies provided valuable contextual information and real-world examples to complement the broader findings of the feasibility study.

3.5 Ethical Considerations

To maintain ethical integrity and protect participant confidentiality, all interviewees were anonymised within this report, ensuring no negative consequences could arise from their responses. Additionally, data collection practices strictly adhered to the requirements of the Protection of Personal Information (POPI) Act, safeguarding the privacy and security of personal information.

3.6 Consolidation of Findings and Report Writing

The research methodology employed a multi-faceted approach to ensure comprehensive data collection and analysis. Triangulation was a key principle, integrating insights from literature review, secondary data analysis, and qualitative interviews and focus groups. This approach allowed for a robust validation of findings, filling gaps in knowledge, and exploring potential solutions.

The diverse research streams, including desktop research, secondary data analysis, interviews, and focus groups, were meticulously analysed and synthesised to inform the development of the draft report. Interviews were analysed thematically, comparing responses across the main research questions to identify key themes related to the demand for artisans in the MICT sector. This rigorous methodology ensured a comprehensive and nuanced understanding of the research topic, contributing to the validity and reliability of the study's findings and recommendations.

3.7 Limitations and Challenges

The study encountered several limitations that may affect the generalizability of the findings. The low response rate to the online survey, despite multiple reminders, raises concerns about the representativeness of the sample . This could be attributed to various factors, such as survey fatigue, lack of interest in the topic, or technical difficulties in accessing the survey.

Furthermore, the limited scale of artisan training currently in the MICT sector posed challenges in obtaining accurate information on the cost of training, the adequacy of equipment, and the types of training providers utilised. This lack of data could hinder the development of precise cost estimates and recommendations for future artisan training programs.

To mitigate these limitations, the researchers supplemented the survey data with qualitative insights from focus group discussions. These discussions provided valuable context and helped to address some of the gaps in the quantitative data. However, the reliance on focus group data may introduce potential biases and limit the generalisability of the findings.

Future research could address these limitations by employing a more diverse range of data collection methods, such as in-depth interviews with a wider range of stakeholders, including artisans, training providers, and policymakers. Additionally, a larger sample size for the online survey could enhance the representativeness of the findings and provide a more comprehensive understanding of the demand for and challenges associated with artisan training in the MICT sector.

4 LITERATURE REVIEW

A comprehensive literature review was conducted and submitted as a separate report. In this section, a high-level summary of this literature review is provided.

4.1 Background

In South Africa, there are various pathways to becoming an artisan, each with its own unique features and requirements. These pathways include apprenticeships, learnerships, the NC(V)4 pathway in public TVET colleges, and Artisan Recognition of Prior Learning (ARPL). Apprenticeships are structured programmes that combine on-

the-job training with theoretical education, typically lasting three to four years. Learnerships are also structured learning programmes, but they are more flexible than apprenticeships and can be undertaken by both employed and unemployed individuals. The NC(V)4 pathway allows students who have completed a National Certificate (Vocational) at level 4 to gain practical work experience and qualify as artisans. ARPL assesses the skills and knowledge individuals have acquired through work experience, allowing them to take a trade test and become certified artisans. While the traditional apprenticeship model has been the most successful pathway, with high throughput and pass rates, other pathways like learnerships and the NC(V)4 have also played a role in artisan development, albeit with varying degrees of success.

The National Development Plan sets a target of 30,000 artisans per year by 2030, and achieving this goal will require collaboration and investment across various sectors. There has been continuous alignment between SETA sector skills plans and the production of artisans. This alignment has been largely due to a process followed by the DHET whereby a Service Level Agreement is negotiated with each SETA to identify specific artisan targets for each sector. Thorough evidence-based processes have been followed to identify the priority trades that inform SETA skills plans and, in broad terms, production was in line with these plans.

Various tracer studies have been conducted. The DHET, through the National Artisan Development Chief Directorate located in the Skills Development Branch, is tasked with collecting data on individuals that pursue artisanal occupational programmes, including apprenticeships and learnerships. A tracer study was conducted on artisans who were found competent between the period 01 April 2018 to 31 March 2019. A summary of the findings is presented below:

- 79.0% of the individuals were employed by a company; 2.0% were self-employed; and 19.0% were unemployed.
- 85.0% were still employed at the same company where they did their apprenticeship.
- Most held a permanent contract.
- A significantly high number (61.0%) were employed by private companies.
- 21.0% were earning between R11 000 and R15 000/month.

4.2 International Benchmarking

A comparative analysis of the apprenticeship systems in Germany and South Korea has been done, examining the distinct strategies each nation employs to enhance workforce development.

For a long time, Germany's National Policies on Apprenticeships have been a cornerstone of the country's vocational education and training system. The German apprenticeship model is firmly established, with clear guidelines for negotiating and implementing training programmes, a strong emphasis on using apprenticeships as a pathway to skilled jobs and middle management positions, and an expectation for businesses to provide apprenticeship opportunities ((Nicklich & Fortwengel, 2017).

The apprenticeship system is internationally renowned for its rigour, collaboration, and mutual benefits for both employers and apprentices, distinguishing it from those in many other countries (Farnbauer, 2021). The vocational training system follows a dual approach, blending theoretical education with hands-on training. This system, governed primarily by the Vocational Training Act (BBiG), offers a variety of programmes, including pre-vocational training and apprenticeships. Company-based training typically lasts two to three and a half years, leading to recognised qualifications and school-based training varies in duration from one to three and a half years (Youth Wiki, 2023).

The German Dual Vocational Education and Training (VET) system is renowned for its strength and innovative capacity, which is underpinned by five key principles listed below (Lee et al., 2017):

- The close cooperation between the state and the economy plays a pivotal role in providing a comprehensive framework for VET. This collaboration includes various aspects such as funding, curriculum development, implementation, and certification.
- VET emphasizes work-process learning, which involves integrating real work situations with school-based education. This approach fosters the development of comprehensive professional competence and encourages independent and responsible problem-solving skills among learners.

- The system adheres to nationwide standards for training and examination. These uniform standards ensure that the qualifications obtained through VET are of high quality and are widely recognized and valued by both businesses and society as a whole.
- The maintenance of high-quality VET is facilitated by well-trained personnel. These individuals possess a combination of technical knowledge and pedagogical skills, enabling them to effectively integrate theory and practice in their teaching methods.
- The German VET system places great importance on research and development. Through ongoing institutionalised research and advisory support, the system continuously evolves and improves, ensuring its relevance and effectiveness in

According to Gessler (2017), the 'dual' system might suggest that companies and vocational schools share equal roles in training apprentices, but companies have much more control and influence over the system than the schools do.

In the domain of Information and Communication Technology (ICT) apprenticeships, in Germany, dual IT apprenticeships are held in high regard due to their practical and comprehensive nature of learning within the information technology field. With a strong emphasis on practical training, dual IT apprenticeships in Germany lay a solid foundation for success in the dynamic field of Information Technology (Redaksion, 2023).

A 2016 evaluation study of IT occupations—such as IT specialist, IT and telecommunications systems electronics technician, IT and telecommunications system support specialist, and IT officer—revealed several key findings (Schwarz et al. 2017; in Lee et al., 2017):

- High overall demand for IT occupations, with a particular growth in software development.
- The need to modernise training regulations to include crucial aspects like data protection, security, big data, and cloud computing, which have become more important since the early 2000s.
- Industry demands to integrate industrial applications (e.g., robotics, sensor technology) into vocational education for existing IT occupations.

- A disparity in trainee satisfaction – while company-based training was rated highly, vocational school education received lower satisfaction due to outdated equipment, materials, and teacher qualifications. This highlights a challenge in the Dual VET system, where schools often lag in digital transformation compared to companies.

The vocational education and apprenticeship systems in South Korea at the time of early economic development were inadequate in meeting the growing need for skilled workers. "Apprenticeship programme involves many stakeholders that include social partners, trade unions, governments, and VET providers" (Moon, 2018, p17). The Korean VET system distinguishes apprenticeship into secondary and post-secondary stages. The former integrates formal education, while the latter highlights workplace learning that results in qualifications or recognition of prior learning. These assessments are based on national competency standards to qualify for government financial support, with a focus on prioritising human capital cultivation from a National Human Resource Development (NHRD) perspective rather than individual professional growth (Moon, 208).

The South Korean government has placed significant emphasis on the apprenticeship system to enhance youth employment opportunities and to create a seamless connection between skills development and skills application. In their analysis of apprenticeship systems, Moon (2018) notes, "Korean apprenticeship practice benchmarked European apprenticeship and thus, its purpose and characteristics are similar to that of European" (p. 8). The Korean-style apprenticeship known as the Work-Learning Dual System (WLDS) offers young individuals the opportunity to acquire relevant job competences through a structured combination of theoretical education at education/training institutions and practical training in real workplaces.

According to Kang (2015; in Moon 2018), Korean apprenticeships are characterised by several distinct features:

- Programmess are either corporate-led or training center-led.
- They address workforce-job mismatches with government funding support for participants.

- Government support extends to programme development, training of trainers, creation of module-based learning materials, and provision of facilities and equipment.
- Apprenticeship programmes are designed based on the unit of competency of national standards

The rapid advancement of digital technologies and artificial intelligence (AI) has brought about a profound change in both the nature of work and the workplace. Korea has been at the forefront of this transformation, swiftly adopting advanced technologies and replacing human labour with robots for routine tasks. In their study, Lee and Jung (2023) draw attention to the imbalance between the supply and demand of ICT skilled workers in South Korea. They note that a mere 5% of the annual labour demand from the ICT sector is fulfilled by college graduates possessing ICT skills. This emphasises the significance of implementing specific skills development initiatives, such as apprenticeships, to bridge the skills gap and cater to the industry's needs.

The Korean Work-Learning Dual System, a fundamental national initiative targeting youth unemployment and the cultivation of a competency-driven society, has witnessed substantial quantitative growth in its initial phases. Despite this, in order to establish itself as a reliable vocational education and training system, there is a crucial requirement for enhanced quality assurance of learning programmes and resources. This includes strengthening the support capabilities of key institutions, such as company instructors at workplaces and joint training centres.

Korean apprentices have traditionally viewed apprenticeship as a means for job creation and subsequent employment opportunities rather than as a platform for professional development facilitated by the reciprocal interaction between a meister and an apprentice. In contrast, the German apprenticeship system mandates that apprentices undergo a comprehensive learning process spanning two to four years under the guidance of meisters, enabling them to acquire skills within a stable environment alongside other apprentices (Kim, 2012; in Moon, 2018).

4.3 Prerequisites for Implementation

The literature review highlights several prerequisites for the successful implementation of artisan development programmes in the MICT sector. These include:

- Establishing strong partnerships between industry, government, and educational institutions to ensure relevant and high-quality training programmes.
- Developing a robust apprenticeship system that combines theoretical and practical training, supported by effective monitoring and streamlined administrative processes.
- Encouraging employer investment in training through incentives and grants.
- Enhancing career guidance services to inform individuals about artisan career paths.
- Continuously updating training programmes to keep pace with technological advancements.
- Creating inclusive training programmes that cater to diverse learners, including those from disadvantaged backgrounds.

By addressing these prerequisites, the MICT sector can effectively develop a skilled artisan workforce capable of meeting the industry's current and future demands, fostering growth and innovation.

5 DEMAND FOR ARTISANS

To ascertain the demand for artisans within the MICT sector, a multifaceted approach was employed, encompassing an analysis of the MICT SETA WSP/ATR 2022/23 submissions, an employer survey, interviews, and focus groups. The analysis of WSP/ATR submissions aimed to determine the current employment of artisans within MICT companies and their future plans for training in artisanal occupations. This multi-pronged approach allowed for a comprehensive understanding of the demand for artisans in the sector, drawing on both quantitative data from the WSP/ATRs and qualitative insights from employer surveys, interviews, and focus groups.

5.1 Employment of Artisans

An analysis of company WSP/ATR for the 2022/23 period reveals that amongst employers submitting in the MICT sector, 5,716 individuals were employed as skilled agricultural, forestry, fishery, craft, and related trades workers. This figure represents 3% of the total MICT sector workforce of 192,369 employees, indicating that while artisans are present in the sector, they constitute a relatively small proportion of the overall workforce.

Table 1: Number of employees by occupational category

Occupational category	2022/23
PROFESSIONALS	29 213
TECHNICIANS AND ASSOCIATE PROFESSIONALS	6 026
CLERICAL SUPPORT WORKERS	27 703
MANAGERS	2 383
SERVICE AND SALES WORKERS	76 344
ELEMENTARY OCCUPATIONS	10 438
SKILLED AGRICULTURAL, FORESTRY, FISHERY, CRAFT AND RELATED TRADES WORKERS	5 716
PLANT AND MACHINE OPERATORS AND ASSEMBLERS	34 310
(blank)	236
Grand Total	192 369

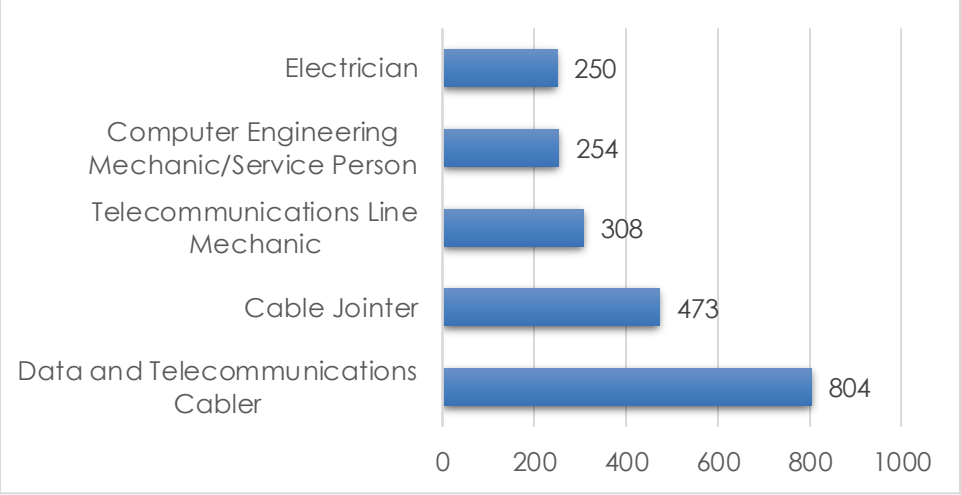
Source: WSP/ATR data 2022/23

This distribution outlined in Table 1 suggests a concentration of artisan roles within specific technical areas of the MICT sector, particularly those related to telecommunications and computer engineering.

The relatively small percentage of artisans in the MICT sector workforce may indicate a limited recognition or utilisation of artisan skills within the industry. This could be due to various factors, such as a lack of awareness of the value that artisans can bring to the sector, a preference for hiring professionals with higher qualifications, or a perception that artisan skills are not relevant to the technologically advanced nature of the MICT sector.

However, the presence of these artisans, particularly in key technical roles, suggests that there is a demand for their skills within the sector. This demand could potentially be leveraged to expand artisan training programs and increase the number of skilled artisans in the MICT sector. The trades with the highest number of employees in the MICT sector in 2022/23 (Figure 3) are Data and Telecommunications Cabler (804); Cable Jointer (473); Telecommunications Line Mechanic (308); Computer Engineering Mechanic/Service Person (254); and Electrician (250).

Figure 3: Trades with the highest number of employees



Source: WSP/ATR data 2022/23

Analysis of the MICT sector's workforce composition, referencing the official list of trades in South Africa, reveals a significant presence of artisans across 56 recognised trades. Furthermore, the data highlights the employment of individuals in "trade-type" occupations not currently registered as formal trades, such as continuous stationery printing machine technician, commercial digital printer, mechanical equipment repairer, and metal fabricator. These findings suggest a potential opportunity for the development and formalisation of artisan-type training programs tailored to these specific occupations within the MICT sector.

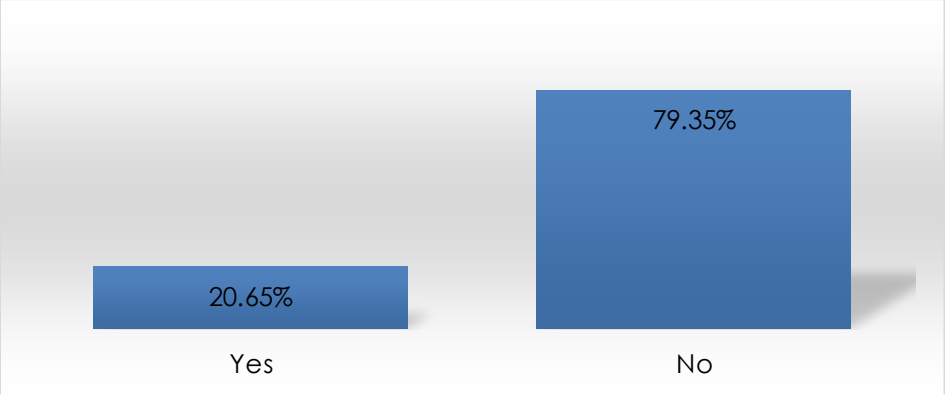
The survey results (Figure 4) indicate a relatively low rate of artisan employment within the MICT sector, with only 20.65% of respondent companies reporting that they currently employ artisans. This suggests that the majority of MICT companies (79.35%) do not employ individuals in traditional artisan roles.

This finding could be attributed to several factors, including the nature of the MICT sector: The MICT sector is primarily driven by technological advancements and may not traditionally rely on artisan skills to the same extent as other sectors like manufacturing or construction. The specific skills required in the MICT sector might not align with the traditional training and qualifications of artisans. There might be a perception among MICT employers that artisan roles are not relevant or necessary for their operations.

This low employment rate of artisans highlights a potential opportunity for the MICT SETA to promote the value and relevance of artisan skills within the sector. However,

it is also important to consider that the survey results might not be fully representative of the entire MICT sector. The low response rate to the survey raises concerns about the generalisability of the findings.

Figure 4: Companies employing artisans



Source: MICT SETA Survey, 2024

Interviews with industry representatives revealed a preference for employing electrical and electronics technicians and engineers over artisans, often outsourcing artisan-related tasks when needed. This preference may stem from the perception that technicians and engineers possess a higher level of theoretical knowledge and problem-solving skills compared to artisans, who are typically associated with practical, hands-on expertise.

However, the WSP/ATR data for 2022/23 indicates a significant demand for specific artisan trades within the MICT sector, particularly Instrument Mechanician, Telecommunications Line Mechanic, Electro Equipment Mechanician, Business Machine Mechanic, Computer Engineering Mechanic/Service Person, and Electrician . These roles, often reported as "Hard to Fill" by employers, highlight a potential misalignment between the perceived and actual demand for artisan skills in the sector.

Furthermore, interviews identified additional hard-to-fill vacancies for specialised roles like surveillance and energy solutions specialists, fibre technicians, cybersecurity experts, and high-voltage electricians . These roles, while not traditionally classified as artisan trades, require a blend of technical knowledge and practical skills that could be developed through artisan-style training programs.

The discrepancy between the interview responses and the WSP/ATR data suggests a potential lack of awareness among some employers regarding the value and relevance of artisan skills in the MICT sector. Additionally, the identification of hard-to-fill vacancies in both traditional and emerging technical roles underscores the potential for expanding artisan training programs to encompass a wider range of skills and occupations within the MICT sector. The trades workers most reported as HTF by employers (Table 2) are Instrument Mechanician (1 242); Telecommunications Line Mechanic (1 127); Electro Equipment Mechanician (330); Business Machine Mechanic (228); Computer Engineering Mechanic/Service Person (219); and Electrician (217)[1].

Table 2: Hard to Fill Occupations (trades) in the MICT sector under the skilled agricultural forestry, fishery, craft and related trades worker occupational category

Occupation	Number of times an employer mentioned the occupation)
Air-conditioning and Refrigeration Mechanic	28
Bricklayer	52
Business Machine Mechanic	228
Cabinet Maker	70
Cable Jointer	30
Computer Engineering Mechanic / Service Person	219
Diesel Mechanic	21
Electrician	217
Electronic Equipment Mechanician	330
Electronic Originator	4
Fitter and Turner	20
Instrument Mechanician	1 242
Mechatronics Technician	15
Millwright	35
Rigger	48
Special Class Electrician	18
Tailor	7
Telecommunications Line Mechanic	1 127
Welder	14

Source: WSP/ATR data 2022/23

[1] 2022/23 data was used for analysis because limited trades were reported as HTFVs in the 2023/24 data.

In interviews, the following were stated as hard-to-fill vacancies: Surveillance and energy solutions specialists; fibre technicians; cyber security experts; and high-voltage electricians.

5.2 Planned Training of Artisans

The data reveals that MICT sector employers plan to train 12,708 employees in skilled trades, representing 1.5% of the total planned training across all occupational categories (Table 3). This indicates a relatively small but targeted focus on artisan development within the sector's broader training initiatives.

The emphasis on training for these specific trades aligns with the identified hard-to-fill vacancies in the sector, indicating a strategic approach to addressing skills shortages and ensuring a pipeline of qualified artisans to meet industry demands. However, the relatively small proportion of planned training dedicated to artisan development raises questions about the sector's overall commitment to investing in this critical area of skills development. Further research and analysis are needed to understand the factors influencing employers' training decisions and to explore strategies for increasing investment in artisan training within the MICT sector.

Table 3: Planned training by occupational category as reported by employers in the MICT sector

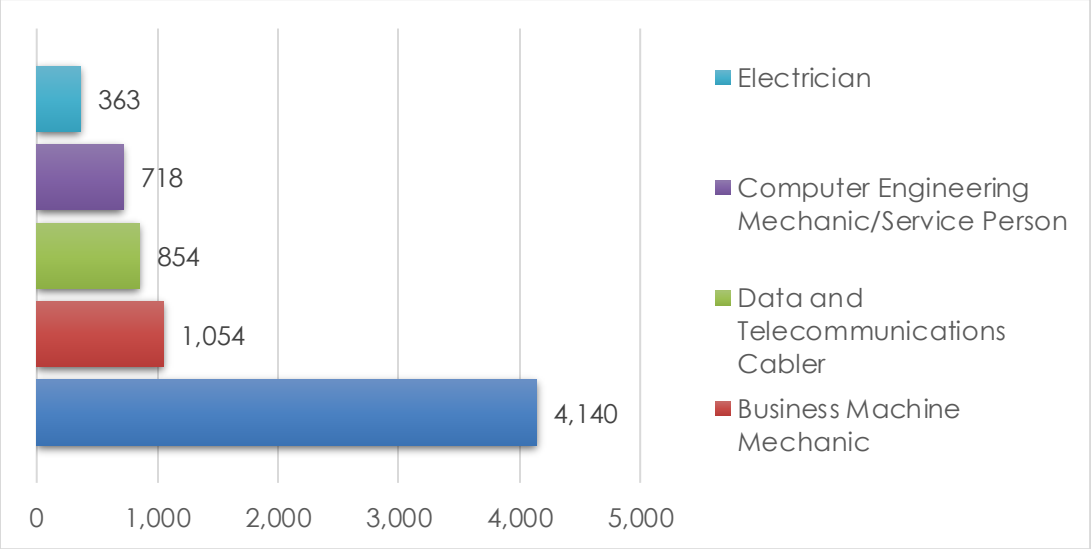
Occupational Category	2022/23
CLERICAL SUPPORT WORKERS	63 905
ELEMENTARY OCCUPATIONS	13 235
MANAGERS	65 907
PLANT AND MACHINE OPERATORS AND ASSEMBLERS	2 531
PROFESSIONALS	536 316
SERVICE AND SALES WORKERS	35 948
SKILLED AGRICULTURAL, FORESTRY, FISHERY, CRAFT AND RELATED TRADES WORKERS	12 708
TECHNICIANS AND ASSOCIATE PROFESSIONALS	126 188
Grand Total	856 738

Source: WSP/ATR data 2022/23

The trades with the highest number of planned trainees (Figure 5) are Telecommunications Line Mechanic (4 140); Business Machine Mechanic (1 054); Data and Telecommunications Cabler (854); Computer Engineering

Mechanic/Service Person (718); and Electrician (363). This distribution suggests a prioritisation of training in trades directly relevant to the MICT sector's core operations and infrastructure, particularly in telecommunications and computer technology.

Figure 5: Planned training by occupation

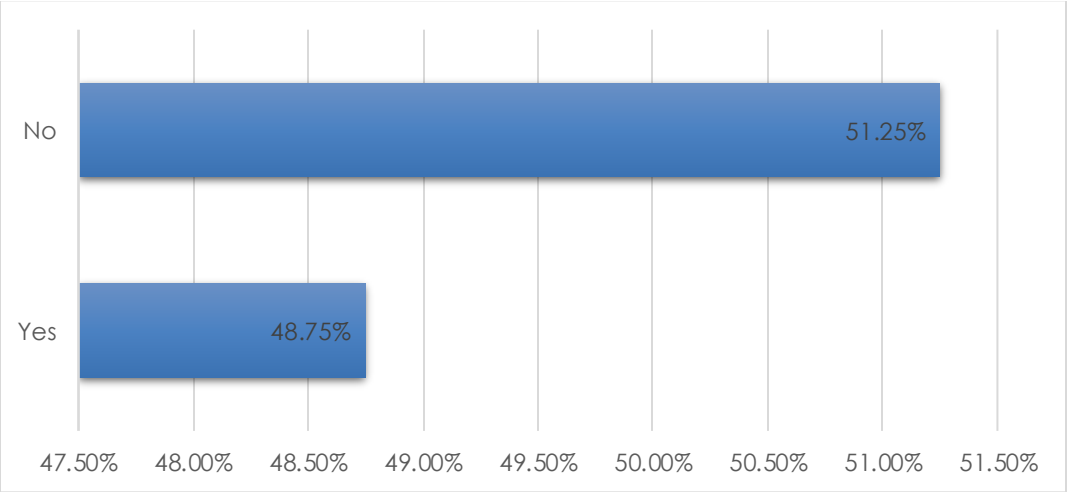


Source: WSP/ATR data 2022/23

A comprehensive table, showing all the planned training by occupation under the skilled agricultural forestry, fishery, craft and related trades worker occupational category (with trades highlighted) is provided in Annexure 2. There are also occupations where training is planned, such as a Continuous Stationery Printing Machine Technician, that could lend itself to being implemented as a trade, even though it is not currently registered as a trade.

The survey results indicate a nearly even split among MICT sector employers (Figure 6) regarding the need for artisans within their organisations. While 48.75% of respondents indicated a need for artisans, a slightly larger proportion (51.25%) reported no such need. This near-even split suggests a degree of ambivalence within the sector regarding the value and relevance of artisan skills.

Figure 6: Employer indication of a need for artisans



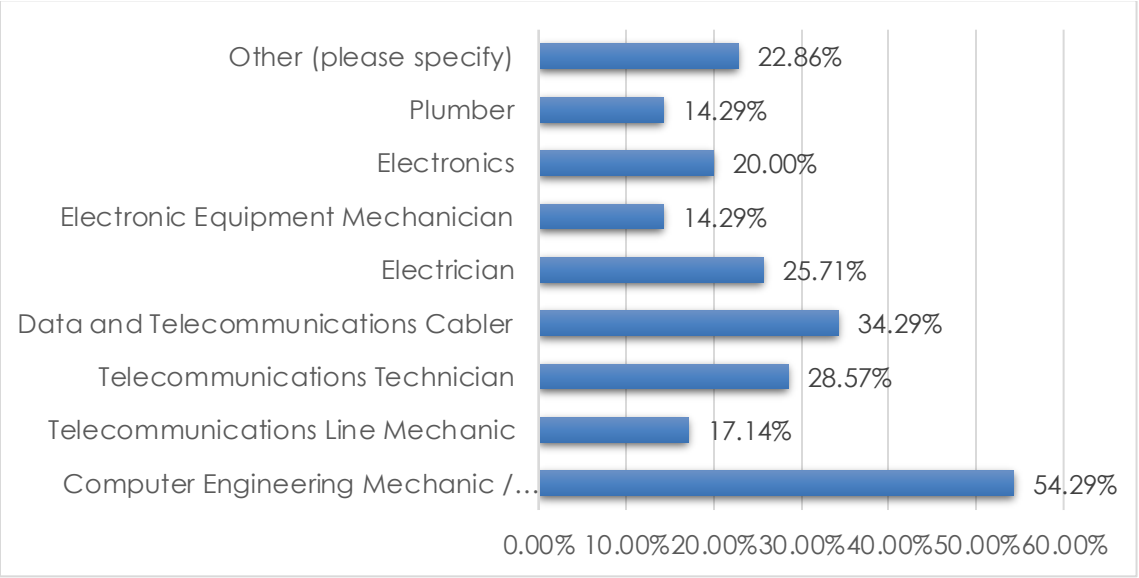
Source: MICT SETA Survey, 2024

The 51.25% who do not perceive a need for artisans may have a limited understanding of the diverse artisan roles listed on the Organising Framework of Occupations (OFO). This could be due to a lack of awareness of the specific skills and competencies associated with broader trades workers or artisanal skills or a misconception that artisan roles are only the hard technical roles traditionally trade-tested and therefore, not relevant to the technologically driven nature of the industry.

The survey results indicate a strong demand for specific artisan trades within the MICT sector over the next five years. Figure 7 shows that the greatest need identified is for Computer Engineering Mechanics/Service Persons, with 54.29% of companies anticipating a need for these artisans. This is followed by Data and Telecommunications Cablers (34.29%), Telecommunications Technicians (28.57%), and Electricians (25.71%). Other trades, such as Electronics, Electronic Equipment Mechanic and Plumber also show a notable demand, albeit to a lesser extent.

This data suggests that the respondents in the MICT sector are experiencing a significant demand for artisans with specialised technical skills, particularly in the areas of computer engineering, telecommunications, and electronics. This could be attributed to the rapid technological advancements in these fields, which require a skilled workforce to install, maintain, and repair complex systems and equipment.

Figure 7: Trades in which companies will need artisans over next five years

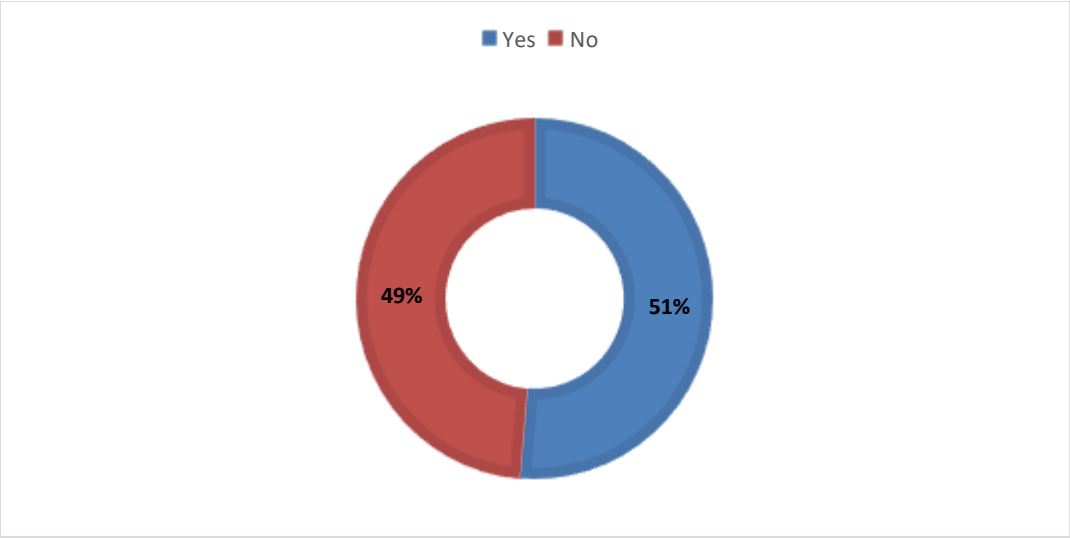


Source: MICT SETA Survey, 2024

** Only trades where a need of more than five was indicated, have been included in the figure below*

The survey results presented in Figure 8 shows that 49% of respondents plan to train artisans in the future, while 51% do not plan to do so. Therefore, about half of survey respondents responded in the affirmative when asked if they planned to train artisans in the future. The fact that nearly half of the respondents plan to train artisans suggests a recognition of the value of artisan skills among a significant portion of the MICT sector. This indicates a potential demand for artisan training programs, particularly if tailored to meet the specific needs of the sector.

Figure 8: Planned training of artisans



Source: MICT SETA Survey, 2024

The analysis reveals a nuanced landscape regarding artisan employment and training within the MICT sector. While some companies express a preference for hiring technicians and engineers, there is a clear demand for artisans in specific trades, particularly those related to electronics, computer engineering and telecommunications. This demand is further underscored by the identification of hard-to-fill vacancies in both traditional artisan roles and emerging technical positions.

Focus group discussions and interviews highlighted a desire for the development of new qualifications that could be implemented as artisan training programs, particularly in areas such as basic network fundamentals, networking agents, field services, ICT development, and fibre optic installation and splicing. These findings suggest that the current artisan training landscape may not fully align with the evolving needs of the MICT sector employers, necessitating the development of new training pathways and qualifications to address these emerging skill requirements.

Furthermore, the analysis indicates that while some companies are already engaged in artisan training, the scale is limited. However, stakeholders strongly agree that artisan training would increase significantly if funding and structural support were provided. This suggests a latent demand for artisan training within the sector, which could be unlocked through targeted interventions and support from the MICT SETA.

Overall, the findings underscore the need for a more comprehensive and tailored approach to artisan development in the MICT sector. This includes not only supporting training in existing trades but also developing new qualifications that reflect the evolving technological landscape and addressing the barriers to training, such as funding constraints and lack of awareness among employers.

5.3 Target Audience for Artisan Development

The survey results indicate a significant discrepancy between the preferred target audience for artisan development among surveyed employers and the actual practices of interviewed companies.

Figure 9 shows that the surveyed employers predominantly focus on training new recruits (73.33%) for artisan roles, with a smaller proportion (20%) training both new recruits and existing employees.

Figure 9: Target audience for artisan development

Source: MICT SETA Survey, 2024

However, company representatives interviewed for the study revealed a contrasting preference for training existing employees. This discrepancy suggests a potential misalignment between the perceived ideal and the practical realities of artisan development within the MICT sector.

The findings highlight the need for further investigation into the reasons behind this discrepancy and the potential implications for artisan development strategies. Understanding the specific challenges and preferences of employers in the MICT sector can inform the design of more effective and targeted training programs that cater to both new recruits and existing employees.

5.4 Completed Training of Artisans

The data in Table 4, derived from the ATRs of MICT sector employers for the 2022/23 financial year, reveals that a total of 655,417 employees received training. Of these, only 9,040 individuals trained (1.4%) were in skilled agricultural, forestry, fishery, craft, and related trades worker occupations. This indicates that artisan training constitutes a relatively small proportion of the overall training efforts in the MICT sector.

The most frequently trained occupational categories were professionals (304,068) and clerical support workers (189,800), which dovetails with the prevalence of those

occupational categories employed in the sector. The comparatively low number of individuals trained in artisan trades suggests a potential underinvestment in this critical area of skills development within the sector. This is particularly because about 3% of employees in the sector are in trades occupations whilst only 1.4% are trained. This could have implications for the sector's ability to address skills shortages and meet the demand for practical, hands-on expertise.

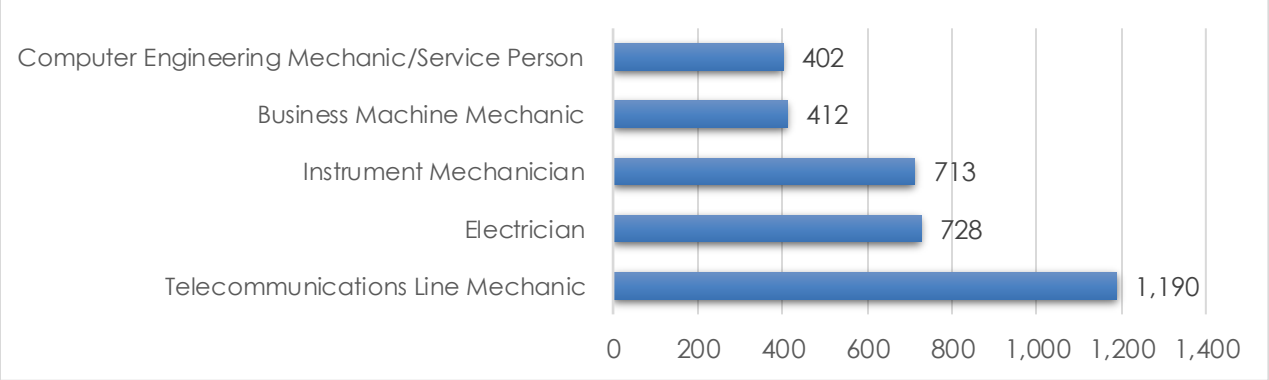
Table 4: Annual Training Report by occupational category

Occupational Category	2022/23
CLERICAL SUPPORT WORKERS	189 800
ELEMENTARY OCCUPATIONS	13 104
MANAGERS	37 302
PLANT AND MACHINE OPERATORS AND ASSEMBLERS	3 981
PROFESSIONALS	304 068
SERVICE AND SALES WORKERS	23 170
SKILLED AGRICULTURAL, FORESTRY, FISHERY, CRAFT AND RELATED TRADES WORKERS	9 040
TECHNICIANS AND ASSOCIATE PROFESSIONALS	74 952
Grand Total	**655 417**

Source: WSP/ATR data 2022/23

Figure 10 reveals that the MICT sector in 2022/23 focused its training efforts on specific technical trades, prioritising Telecommunications Line Mechanics, followed by Electricians, Instrument Mechanics, Business Machine Mechanics, and Computer Engineering Mechanics/Service Persons. This distribution of training aligns with the sector's operational needs, particularly in telecommunications and computer technology, which are critical for maintaining and expanding digital infrastructure and services. The high number of Telecommunications Line Mechanics trained may reflect the ongoing expansion of telecommunications networks and the demand for skilled technicians to install and maintain these networks. Similarly, the training of Electricians and Computer Engineering Mechanics/Service Persons reflects the need for expertise in maintaining and repairing electrical and computer equipment, which are essential components of the MICT sector.

Figure 10: Trades with the highest number of trainees

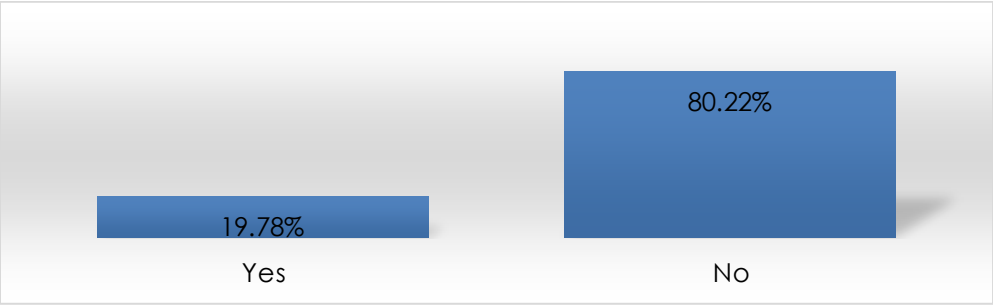


Source: WSP/ATR data 2022/23

The training of Business Machine Mechanics and Instrument Mechanics, although fewer in number, indicates a demand for specialised skills in maintaining and repairing office equipment and precision instruments, respectively, which are also relevant to the MICT sector. A comprehensive table in Annexure 2 shows the training completed by employers by occupation under the skilled agricultural forestry, fishery, craft, and related trades worker occupational category, with the trades highlighted. This table also includes occupations that are not designated as trades, where training is happening, and where the training could potentially be implemented as a trade.

The survey results (Figure 11) indicate that a minority of respondents, approximately 19.78%, are currently involved in artisan training within the MICT sector. This suggests that the majority of companies (80.22%) are not actively engaged in training artisans, which supports the 1.4% training of trades workers reported by employers in the ATRs.

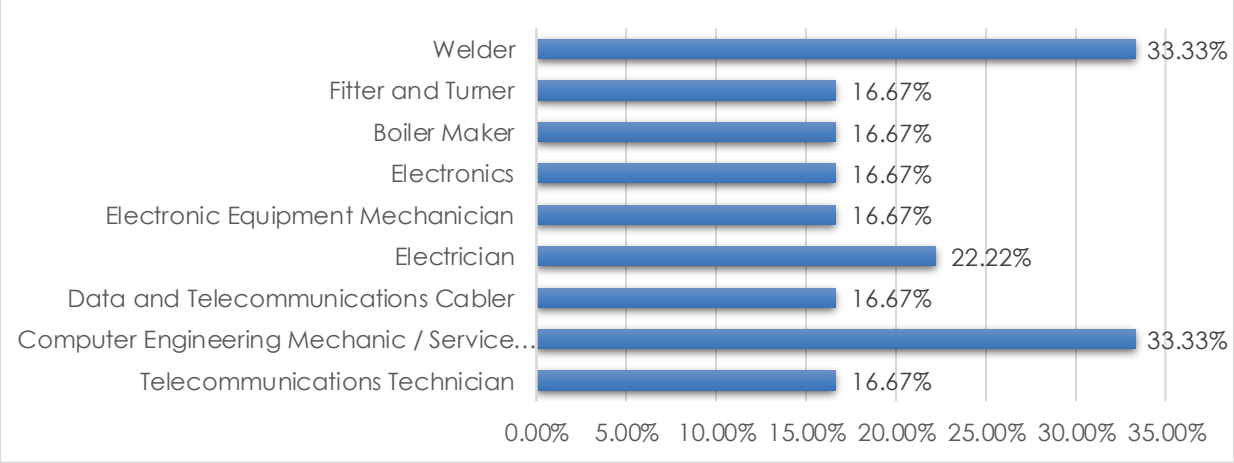
Figure 11: Are you involved in artisan training?



Source: MICT SETA Survey

The survey data in Figure 12, based on 18 respondents who indicated they are training artisans, shows the trades in which these companies provide training.

Figure 12: Trades in which companies provide training



Source: MICT SETA Survey

The most common trades being trained are Welder and Computer Engineering Mechanic/Service Person, both at 33.33%. This is followed by Electrician (22.22%), while the remaining trades (Fitter and Turner, Boilermaker, Electronics, Electronic Equipment Mechanic, Data and Telecommunications Cabler, and Telecommunications Technician) all have a training frequency of 16.67%.

The presence of trades like Welder and Boilermaker suggests that some companies within the MICT sector might have diversified operations beyond the core ICT domain, perhaps venturing into areas like infrastructure development or renewable energy, as indicated by the mention of solar technology.

6 OCCUPATIONAL QUALIFICATIONS AND TRAINING GAP ANALYSIS

6.1 Qualifications Associated With a Trade

An analysis of occupational qualifications reveals a potential disconnect between existing qualifications and the specific needs of artisan training in the MICT sector. While some stakeholders acknowledge similarities between occupational qualifications and trades training, emphasising the progression from knowledge acquisition to practical application and workplace learning, others highlight key differences.

One interviewee noted that current QCTO-developed occupational qualifications lack the depth and hands-on focus required for artisan development, emphasising the need for "actual tactile skill versus theoretical skills". Another interviewee expressed concerns about the lack of confidence in deploying individuals who have completed occupational qualifications to service machines or provide customer solutions,

contrasting this with the assurance provided by artisan programs where individuals have "earned their hours" and been mentored in a structured environment.

Despite these concerns, one respondent highlighted the similarities between occupational qualifications and trades training, emphasising the progression from knowledge to practical application and workplace learning, culminating in international certification or assessment. However, a key distinction remains: apprenticeship training prioritises workplace learning under a mentor's guidance, with work experience documented in a logbook and culminating in a nationally recognised trade test after three to four years. While occupational qualifications offer a foundation in theoretical knowledge and practical skills, given their novel nature, stakeholders are not confident that they may fully address the specific requirements similar to artisan training in the MICT sector.

Table 5 below shows that the MICT SETA has registered a total of 21 qualifications with the QCTO.

Table 5: Qualification registered with the QCTO

QUALIFICATION TITLE	NQF LEVEL	CREDITS
Artificial Intelligence Software Developer	NQF Level 5	209
Data Science Practitioner	NQF Level 5	185
Cloud Administrator	NQF Level 4	149
Design Thinking Practitioner	NQF Level 4	100
Quality Test Automator	NQF Level 5	179
Software Developer	NQF Level 5	220
Software Engineer	NQF Level 6	240
Design Thinking Innovation Lead	NQF Level 4	160
Telecommunications Cable Jointer	NQF Level 3	265
Computer Technician	NQF Level 5	282
Cybersecurity Analyst	NQF Level 5	173
E-Waste Operations Controller	NQF Level 4	167
Internet-of-Things Developer	NQF Level 4	141
Robotic Processing Automation (RPA) Developer	NQF Level 5	185
Advertiser	NQF Level 5	120
Extended Reality Developer	NQF Level 6	218

QUALIFICATION TITLE	NQF LEVEL	CREDITS
Information and Communication Technology: Business Development Consultant	NQF Level 5	120
Remotely Piloted Aircraft Systems (RPAS) Technician	NQF Level 4	212
Software Tester	NQF Level 5	70
Sound Operator	NQF Level 5	168
Telecommunications Specialist	NQF Level 5	

Source: QCTO web-site

Although none of these qualifications are currently being implemented as artisanal-type training, two can be linked to occupations that lend themselves to artisanal-type training (based on inputs received during interviews). These are Telecommunications Cable Jointer and Computer Technician. The credit value of the Telecommunications Cable Jointer is 265 and for Computer Technician 282, which implies that the duration of training is more or less 2,5 years.

6.2 Gaps in the Market Where Artisanal Programmes Could Thrive

Fieldwork conducted for this study has revealed several gaps in the market regarding available qualifications for artisan-level skills within the MICT sector. One interviewee highlighted the inadequacy of existing technical skills learnerships, suggesting that artisan training, particularly in electrical or electronics fields, would be a more suitable fit for addressing the sector's needs.

Additional areas identified during fieldwork where artisan programs could thrive include:

- Installation technicians- both fibre and wireless networks
- Splicing technicians
- Network technicians (building a network both fibre and wireless)
- Network NOC Engineers
- Helpdesk agents
- ICT Developers
- VoIP specialists
- Technical sales programmes
- Cyber security, programmers,
- Cloud computing technicians;
- Blocking of unauthorised apps,

- Developing remote vehicle control systems, and
- Implementing SIM-based vehicle tracking
- Cloud storage solutions.

Stakeholders have expressed concerns about the lack of local development in South Africa and the reliance on international companies for cloud computing services, indicating a potential area for growth in domestic artisan training.

Within the telecommunications sub-sector, a significant need has been identified for training in basic network fundamentals, networking agents, and field services, encompassing roles from network construction to installation and ICT development. Focus group participants emphasised the need for a comprehensive artisan program in this area, potentially covering installation technicians, splicing technicians, and network maintenance personnel, emphasising technical and soft skills. These findings underscore the need for the development and implementation of new artisan training programs that cater to the specific and evolving needs of the MICT sector.

7 CHALLENGES AND BENEFITS OF ARTISAN DEVELOPMENT

7.1 Challenges

The literature review conducted for this research found that challenges in artisan development in South Africa are multifaceted and deeply rooted in the country's socio-economic context. Challenges have also been identified in the survey, and during focus group discussions.

7.1.1 Misalignment Between Skills Produced and Industry Needs

The literature review found that one of the primary challenges is the misalignment between the skills produced by education and training providers and the actual needs of the industry. This skills mismatch is evident in the high unemployment rate among artisan graduates, despite the reported shortage of skilled artisans in various sectors (LGSETA, 2021). This misalignment can be attributed to several factors, including outdated curricula, inadequate training facilities, and a lack of industry involvement in curriculum development.

The rapid pace of technological advancements poses a challenge for artisan development. The skills required in the MICT sector, for example, are constantly evolving, making it difficult for training programs to keep up. This necessitates

continuous curriculum transformation and upskilling of instructors to ensure that artisans remain relevant and competitive in the job market (Kana, 2024). This was emphasised by MICT SETA stakeholders in interviews and in focus groups. Trades and occupational qualifications are often outdated by the time they become available. Where new qualifications need to be developed, there is the possibility that there are not quality training providers available across the country.

7.1.2 Funding

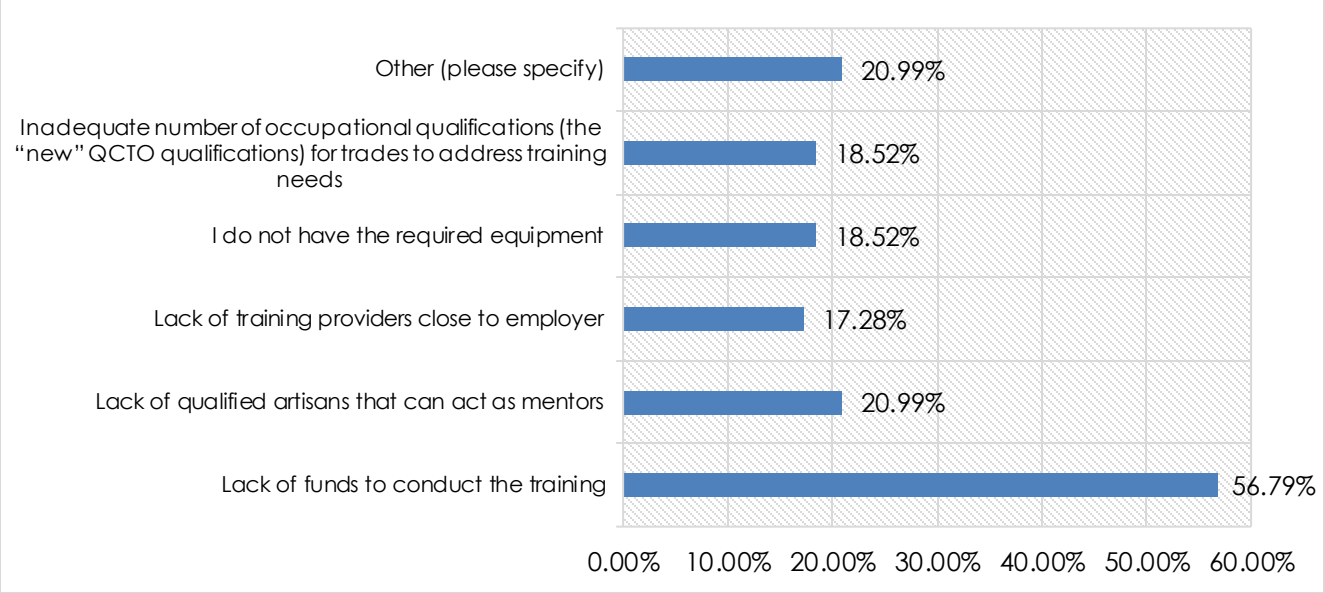
The issue of funding remains a persistent challenge in artisan development. While the government has implemented various funding mechanisms, such as the Skills Development Levy and grants, these are often insufficient to cover the high costs of training. This financial burden can deter employers from investing in artisan training, leading to a reliance on foreign recruitment for skilled artisans (The Research Consortium, 2008). Additionally, the complex and bureaucratic nature of the funding system can create barriers for small and medium enterprises (SMEs) to access and utilize available funds.

Funding has been identified by more than 50% of survey respondents as a barrier for training artisans. This has been confirmed in interviews and focus groups.

7.1.3 Implementation Challenges

In the employer survey, employers indicated a range of challenges that are barriers to training artisans, in addition to funding. These are shown in the figure below.

Figure 13: Barriers to training artisans



Source: MICT SETA Survey, 2024

Survey respondents as well as some interviewees indicated that they lack qualified artisans to act as mentors, although focus group respondent felt that they would have a sufficient number of people that can fulfill that role. Although the availability of equipment has been identified as a challenge by some survey respondents, interviewees and focus group participants did not see that as a major challenge. Lack of training providers close to the employer also pose a challenge for some employers.

A challenge that has been identified in a case study, relates to motivating internally for training: "*The biggest barrier is actually getting approval from non-management and from an HR budget point of view. We really have to motivate why it is important that we need to get these skills into the business. The fear from HR or the fear from senior management is that once we have this artisan that has the ability to do installations and give the certificate of compliance, they will leave and go create their own business. So, it is addressing the fear within the business that upskilling these individuals will actually increase staff turnover*."

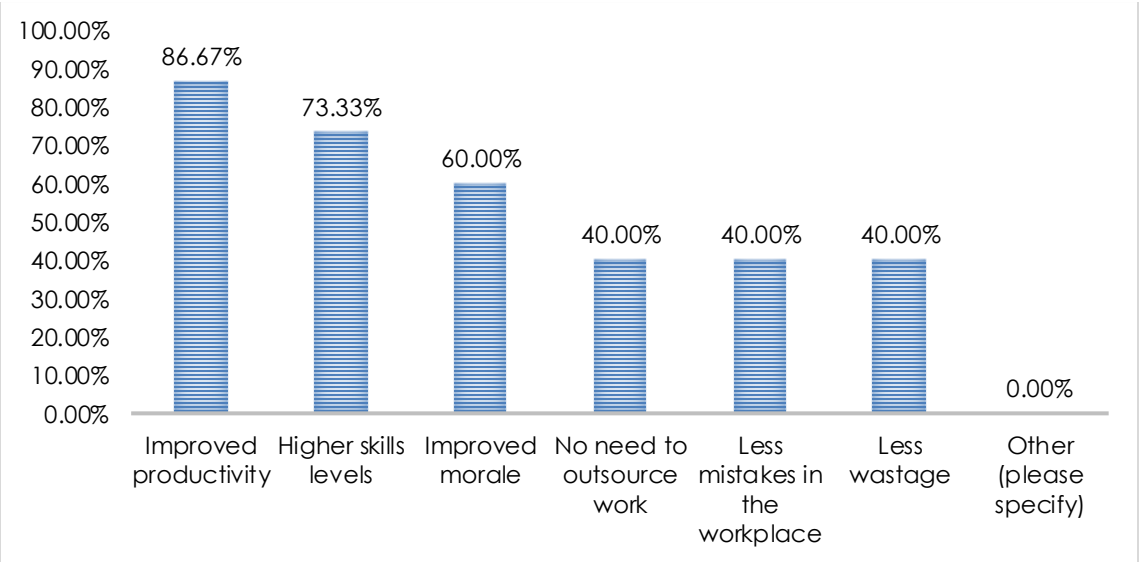
7.2 Benefits of Artisan Training

Many benefits of training artisans have been expressed in interviews and case studies. One interviewee stated that "*I think our biggest motivation at this point is that we can rely less on external vendors if we have the skills in house, so it just makes a lot of*

economic sense to not pay an outside vendor. If we have an electrician for instance on staff. It also has the added benefit of the tasks getting completed quicker".

The survey respondents indicated a range of benefits, illustrated in Figure 14 below. These include improved productivity, higher skills levels and improved morale.

Figure 14: Benefits of training artisans



Source: MICT SETA Survey, 2024

An interviewee stated that "*It is good and well to have the theoretical background. However, it is very important to us and we cannot afford to have someone that just understands how the machine works. They need to actually be able to fix a machine in order for us to deliver on our service commitments to our customers. So apprenticeships then give us that, where a person is also able to get on the job training, so it is going to mitigate against youth unemployment. It also gives an opportunity to an untapped market, so not everyone will qualify or can afford to go get a qualification at a university or university of technology. Whereas artisan training then solves for that because it is also covered in the FET colleges*"

8 FINANCIAL IMPLICATIONS AND BENEFITS

Artisan development in South Africa is supported by a complex funding landscape, with the Skills Development Levy (SDL) serving as a primary source. Employers contribute 1% of their payroll to the SDL, which is then distributed to various entities,

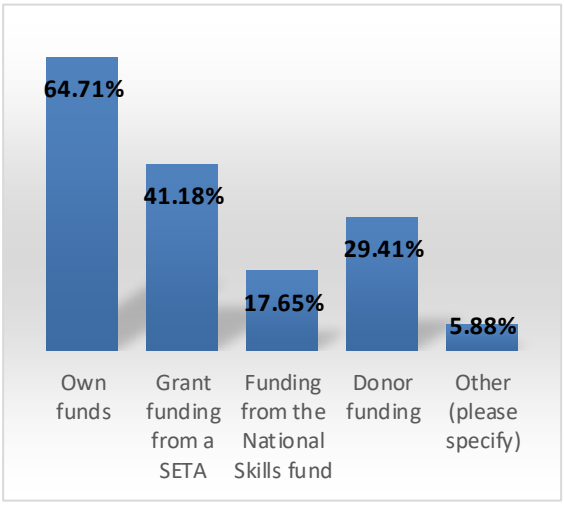
including the National Skills Fund (NSF), Sector Education and Training Authorities (SETAs), and the National Student Financial Aid Scheme (NSFAS) (GTAC, n.d.). The majority of the SDL allocation, 80%, is directed towards SETA training initiatives, demonstrating a commitment, amongst other, to the development of skilled artisans across the country (GTAC, n.d.).

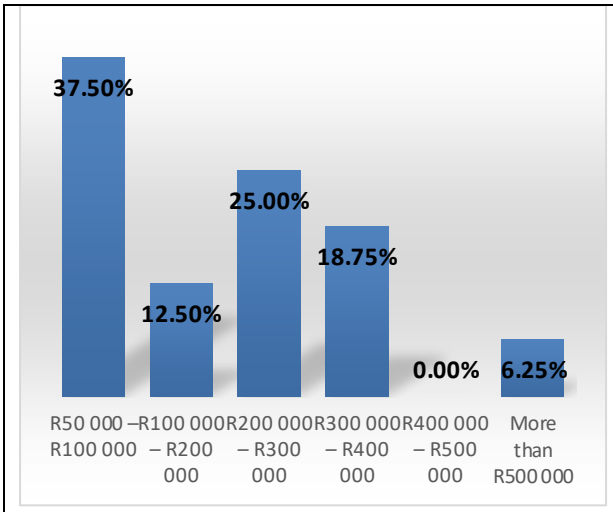
Training artisans in South Africa is costly, with estimates indicating that it takes approximately R400,000 to train a single artisan (von Maltitz, 2018). Figure 15 shows that the majority of respondents (37.50%) reported costs ranging from R50,000 to R100,000 per artisan, with a smaller percentage (25%) indicating costs exceeding R100,000. This high cost could deter some employers from investing in artisan training, particularly smaller businesses with limited budgets.

The data illustrated in Figure 16 reveals that most employers (64.71%) in the MICT sector primarily fund artisan training through their own funds. This suggests a significant reliance on internal resources for skills development, potentially indicating a lack of external funding options or a preference for maintaining control over the training process. However, a substantial proportion of employers (41.18%) also receive grant funding (mostly mandatody grants) from the SETA, highlighting the role of the SETAs in supporting artisan development within the sector. Additionally, some employers (17.65%) utilise funding from the National Skills Fund, while a smaller percentage (5.88%) rely on donor funding or other unspecified sources.

Figure 15: Cost of training an artisan

Figure 16: Funding of artisan training





Source: MICT SETA Survey, 2024

Source: MICT SETA Survey, 2024

The high percentage of self-funded training raises questions about the financial sustainability of artisan development within the MICT sector, particularly for smaller companies with limited resources. It also suggests a potential opportunity for the MICT SETA to expand its grant funding initiatives and provide additional support to employers in financing artisan training programs. Furthermore, the diverse range of funding sources utilised by employers indicates a need for a more comprehensive understanding of the funding landscape for artisan development in the MICT sector. This includes exploring the effectiveness of different funding mechanisms, identifying potential barriers to accessing funding, and developing strategies to encourage greater collaboration between employers, SETAs, and other stakeholders in financing artisan training initiatives.

8.1 Cost of Artisan Training

The complexity of the funding system, coupled with the high costs associated with artisan training, underscores the need for continued investment and innovative approaches to ensure the sustainable development of skilled artisans in South Africa.

The GTAC developed an Expenditure Review Process (EPR) costing model to evaluate the expenses associated with different policy decisions and goals regarding artisan development.

The model considers various factors such as the number of artisan learners enrolled, grant funding proportions, grant values, TVET college enrolment rates, NSFAS support

proportions, tax rebate values, and throughput rates. The EPR process focused on four pathways to becoming an artisan: formal apprenticeship or learnership, accelerated artisan programme, integrated occupational qualification, and RPL.

The GTAC's analysis revealed that the cost of training artisans is substantial, with administration, theoretical training, practical training, and workplace training being the main cost drivers. The administration costs, while only 4% of the total, are crucial for the success of artisan development. Government spending on theoretical training in public TVET colleges is significant, while practical training costs are mostly covered by employers, with partial funding from SETAs and the NSF. The spending review on artisan training for the 2014/15 financial year showed that the largest expenditure was on practical and workplace training, followed by theoretical training and administration.

The GTAC's analysis highlights the significant financial investment required for artisan development in South Africa. It also emphasises the need for effective policy decisions and implementation strategies to ensure the optimal utilisation of resources and the achievement of artisan development goals.

In the merSETA artisan pathways evaluation (2020) study, a costing model was developed to assess the financial implications of artisan training across different pathways. The merSETA defines return on investment as the outcomes from its investments, primarily measured by the number of learners completing trade tests and becoming artisans.

Given the apprenticeship duration, return on investment calculations typically start four years after learners complete three years of enrolment, necessitating data from 2011/12 to 2013/14, with additional data, sought for 2014/15 enrolments to estimate return on investment over the evaluation period spanning 2011/12 to 2017/18.

The financial support provided for apprenticeships has seen a notable increase, with the nationally determined grant amount per apprentice rising from R112,500 in 2011/12 to R165,000 in 2018/19. By 2022/23, this financial support further escalated to R206,290.00 per apprentice with additional provisions for apprentices with disabilities. This upward trend in financial support underscores a growing commitment to artisan development. The next revision date for these grants is set for April 2025.

Should the MICT SETA make the decision to provide financial support for artisan development, the grant per apprentice will be R206,290.00. There will be additional costs, which will be discussed in Section 9 of this report.

8.2 Cost-benefit Analysis of Artisan Training

In the merSETA artisan pathways evaluation (2020) it was found that there was a consistent rise in the proportion of funded apprenticeship programmes. This suggests a growing reliance on merSETA funding for artisan training. Between the financial years 2011/12 and 2014/15, merSETA's investment in apprenticeship grants was estimated to be at least R780 million. The return on this investment, calculated as the amount attributed to learners who successfully passed trade tests, was estimated to be R570 million. The trade test success rates for these years ranged from 69% to 74%, signalling a substantial return on investment. However, given the substantial amounts invested in artisan development, it is worrying that almost a quarter of those enrolled had not yet passed their trade tests.

This financial analysis underscores the significant investment made by merSETA in apprenticeship programmes and the positive returns observed in terms of the number of apprentices who successfully qualified as artisans. However, it also highlights the ongoing financial commitment required to support apprentices who are still in training and have not yet achieved artisan status.

Furthermore, the merSETA evaluation revealed that the cost of investment versus return on investment for learnerships is less favourable compared to apprenticeships. From 2011/12 to 2014/15, merSETA spent an estimated R313 million on learnership grants, but only R52 million resulted in learners who passed trade tests and became artisans. This indicates that a significant portion of the investment, R261 million, was allocated to learners who did not complete the program or did not pass the trade test. This does not necessarily mean the funds were wasted, as learnerships can still provide valuable skills and knowledge that may lead to employment, even if not directly as an artisan. However, it highlights the need for a more critical evaluation of the effectiveness of learnerships as a pathway to artisan qualification and employment.

In contrast, the ARPL pathway demonstrated a more efficient use of resources, with a high completion rate and a low cost of non-completions compared to

apprenticeships and learnerships. This suggests that the sector got good value from its investment in ARPL, as it effectively facilitates the certification of skilled workers who have already acquired their skills through work experience.

Overall, the merSETA evaluation highlights the importance of carefully considering the cost-effectiveness of different artisan training pathways. While apprenticeships remain the most successful pathway, ARPL also demonstrates a high return on investment. Learnerships, while valuable for skills development, may not be the most efficient pathway to artisan qualification.

8.3 Funds Spent on Training of Artisans by MICT SETA Stakeholders

Error! Reference source not found. illustrates the funds spent on training and the number of individuals trained under the trades worker occupational category within the MICT sector during the 2022/23 financial year. The data, sourced from the WSP/ATR submitted to the MICT SETA, reveals a total expenditure of over R49 million on training 9,040 individuals.

A significant portion of the budget, R23 million (46.8%), was allocated to bursaries, indicating a substantial investment in supporting learners through financial aid. This is followed by a considerable amount spent on skills programs, amounting to R16 million (34.4%), suggesting a focus on enhancing specific skill sets within the workforce. Learnerships for both employed (18.1) and unemployed (18.2) learners also received notable funding, with R328,900 and R14 million allocated, respectively, highlighting the commitment to upskilling both existing employees and new entrants to the sector.

Table 6: Money spent on training-by-training programme and number of trained under the skilled agricultural forestry, fishery, craft and related trades worker occupational category

Training programme	2022/23 – Money spent on training	2022/23 – Total trained
AET End-user Computing	R1 725 640	566
Apprenticeships	R231 161	56
Bursaries	R11 919 237	1 147
Internships	R168 190	22
Learnership for 18.1 Learners	R328 900	529
Learnership for 18.2 Learners	R14 006 156	420

Training programme	2022/23 – Money spent on training	2022/23 – Total trained
Occupational Programmes	R24 128	33
Professional Placements	R2 944 191	341
Short Courses	R839 271	455
Skills Programmes	R16 992 098	5 326
Work Integrated Learning	R72 585	98
Workplace Integrated Learning	R222 144	47
Grand Total	**R49 473 701**	**9 040**

Source: WSP/ATR data 2022/23

Interestingly, a relatively small amount reflecting 0.5% of expenditure, was spent on apprenticeships, indicating a lower prioritisation of this traditional training pathway. This could be attributed to various factors, such as the perceived costs and time commitment associated with apprenticeships, or a preference for more flexible training models like learnerships. The remaining budget was distributed among other training programs, such as AET end-user computing, internships, professional placements, short courses, and workplace-integrated learning. These programs cater to diverse learning needs and preferences, providing a range of options for individuals seeking to develop their skills within the MICT sector.

Table 7 shows the financial investments made in training for various artisan occupations within the trades worker occupational category during the 2022/23 financial year. The data indicates a significant disparity in spending across different trades, with some receiving substantial investments while others receive minimal funding.

The highest expenditure was allocated to training Instrument Mechanics (R15,938,014), followed by Electronic Originators (R6,347,520) and Electricians (R6,310,585). This suggests a prioritisation of these trades, potentially reflecting a higher demand or strategic importance amongst employers. Several trades, such as Cable Jointer and Fitter and Turner, received minimal funding, indicating a lower priority or perceived demand for these skills within the sector

Table 7: Total amount spent by occupation and programme type under the skilled agricultural forestry, fishery, craft and related trades worker occupational category

Occupation and programme type	2022/23 – Money spent on training
Air-conditioning and Refrigeration Mechanic	**R101 252**
Bursaries	R101 252
Bricklayer	**R1 352 000**
Bursaries	R1 352 000
Business Machine Mechanic	**R1 029 394**
AET End-user Computing	R97 568
Learnership for 18.2 Learners	R883 550
Skills Programmes	R48 276
Cable Jointer	**R21 360**
Bursaries	R21 360
Computer Engineering Mechanic / Service Person	**R1 022 189**
Graduate Internship	R8 190
Learnership for 18.2 Learners	R420 042
Short Courses	R145 950
Skills Programmes	R225 863
Workplace Integrated Learning	R222 144
Continuous Stationery Printing Machine Technician	**R160 000**
Graduate Internship	R160 000
Electrician	**R6 310 585**
Apprenticeships	R64 911
Bursaries	R6 081 530
Occupational Programme	R15 050
Short Courses	R88 214
Skills Programmes	R60 880
Electronic Equipment Mechanician	**R1 173 326**
Short Courses	R15 000
Skills Programmes	R1 144 826
Work Integrated Learning	R13 500
Electronic Originator	**R6 347 520**
Learnership for 18.2 Learners	R6 347 520
Fitter and Turner	**R14 667**
Bursaries	R9 200
Short Courses	R5 467
Instrument Mechanician	**R15 938 014**

Occupation and programme type	2022/23 – Money spent on training
AET End-user Computing	R1 340 279
Bursaries	R1 883 490
Learnership for 18.2 Learners	R6 355 044
Skills Programmes	R6 359 201
Mechatronics Technician	**R10 890**
Bursaries	R10 890
Tailor	**R357 525**
Short Courses	R357 525
Telecommunications Cable Jointer	**R9 078**
Occupational Programme	R9 078
Telecommunications Line Mechanic	**R232 750**
Apprenticeships	R166 250
Short Courses	R54 600
Skills Programmes	R11 900
Telecommunications Technician	**R13 186 743**
AET End-user Computing	R287 793
Bursaries	R2 459 515
Learnership for 18.1 Learners	R328 900
Professional Placements	R1 075 536
Skills Programmes	R9 034 998
Grand Total	**R49 473 701**

Source: WSP/ATR data 2022/23

The analysis reveals interesting insights into funding allocation for artisan development within the MICT sector. Despite the prevalence of various artisanal occupations, the financial investment in apprenticeship training is notably limited, constituting a mere 0.5% of the total training expenditure. Conversely, a substantial portion of the training budget is allocated towards learnerships for unemployed individuals (18.2 learners) and skills programs, indicating employer preferences in the implementation of skills development interventions.

These preferences are further corroborated by qualitative feedback from interviewees and focus group participants. An interviewee highlighted the lack of funding and educational support as key barriers to the adoption of the apprenticeship model within the media sector. Focus group participants echoed this

sentiment, indicating a strong willingness to engage in artisan training if funding was made available. This disconnect between the demand for artisan skills and the limited funding for apprenticeship programs demonstrates the need for a reevaluation of funding strategies within the MICT SETA.

This further suggests that a shift in funding priorities towards apprenticeship programs could potentially stimulate a significant increase in artisan training within the sector. This reallocation of resources could not only address the existing skills gap but also foster a more sustainable and effective approach to artisan development, aligning with the long-term goals of the MICT SETA and the broader national skills development agenda.

9 SYSTEMS, STRUCTURES AND COST CONSIDERATIONS NEEDED FOR IMPLEMENTING ARTISAN PROGRAMMES

The literature review and fieldwork conducted for this study have identified several prerequisites for the successful implementation of artisan development programs in the MICT sector. These prerequisites encompass a multi-faceted approach that addresses both systemic and operational aspects of artisan training. These include:

- Establishing strong partnerships between industry, government, and educational institutions to ensure relevant and high-quality training programmes.
- Developing a robust apprenticeship system that combines theoretical and practical training, supported by effective monitoring and streamlined administrative processes.
- Encouraging employer investment in training through incentives and grants.
- Enhancing career guidance services to inform individuals about artisan career paths.
- Continuously updating training programmes to keep pace with technological advancements.
- Creating inclusive training programmes that cater to diverse learners, including those from disadvantaged backgrounds.

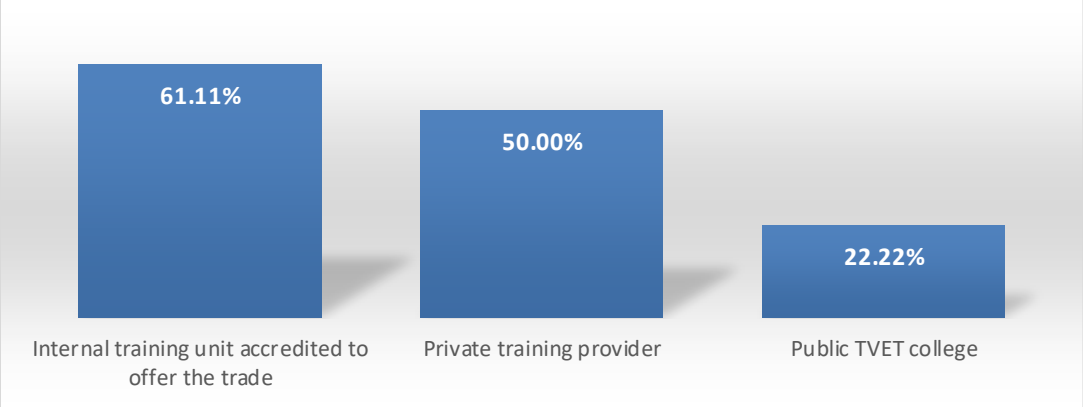
In addition to these prerequisites, fieldwork emphasised a number of key issues that need to be in place:

- The MICT SETA policy and budget approval to fund artisan development, importantly for employed workers and not only the unemployed.
- Advocacy in the MICT sector about opportunities for artisan development.
- Identification of existing training providers accredited to deliver artisan training for existing trades.
- A pool of mentors have to be developed and trained. That is why it is important that employed workers should be included in artisan development.
- Workplaces that can do workplace training must have the required equipment for training.

Figure 17 indicates a significant reliance on internal training resources among MICT sector employers, with 61.11% utilising their internal training units for artisan development. This suggests a preference for in-house training, potentially due to cost-effectiveness, customisation to specific company needs, and greater control over the training process.

The use of private training providers (50%) and public TVET colleges (22.22%) for artisan training highlights the need for expanded coverage of occupational qualifications amongst accredited providers, especially in light of legacy qualifications being discontinued.

Figure 17: Training providers used



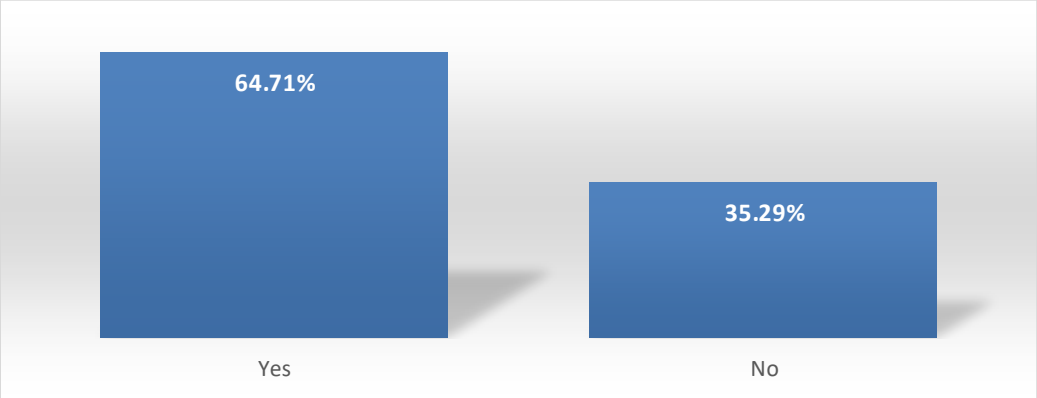
Source: MICT SETA Survey, 2024

The need for accredited providers has been expressed in interviews and focus groups. A focus group participant stated that "*in terms of accreditation, it would be great if there are accredited providers who can support this. Especially if we can find a link*

between the QCTO and finding the relevant programs and making sure it is accredited. It is difficult. We are a nationally spread company, so it is difficult to maintain quality in our programs. So having an accredited provider that is going to give us a consistent quality in terms of programs and presentation would definitely benefit us." This suggests that while companies recognise the value of external training providers, they may face difficulties navigating the accreditation landscape and finding providers that meet their specific needs. This need for accredited providers is evident, especially for larger companies with multiple locations.

The survey results (Figure 18) indicate that a majority (64.71%) of MICT sector employers believe they have adequate equipment to provide artisan training. This suggests a positive outlook regarding the sector's capacity for qualifications requiring in-house training implementation.

Figure 18: Adequacy of equipment for training



Source: MICT SETA Survey, 2024

However, a notable 35.29% of respondents indicated a lack of adequate equipment. This reveals a potential disparity in resources within the sector, with some companies potentially facing barriers to implementing effective artisan training due to equipment limitations. Addressing this issue will be crucial to ensure equitable access to training opportunities.

Focus group discussions affirmed the survey results regarding equipment adequacy, suggesting that most companies possess the necessary resources for artisan training. However, the availability of qualified mentors poses a challenge due to the limited history of artisan training in the sector. Despite this, focus group participants expressed

optimism about developing mentorship capacity internally, emphasizing the need for practice and upskilling to effectively mentor future artisans.

The rapidly changing technological landscape of the MICT sector necessitates continuous updates to qualifications and associated curricula to maintain their relevance. An interviewee highlighted this challenge, stressing the need for a flexible accreditation system that allows for easy updates to technology components without requiring a complete re-application process.

Fieldwork further revealed a consensus among stakeholders on the importance of collaboration in building capacity for artisan training. The suggestion of sharing experiences and best practices among employers to identify commonalities and guide future directions underscores the value of collective knowledge and collaborative problem-solving.

Moreover, stakeholders emphasised the crucial role the MICT SETA can play in supporting artisan training, including curriculum development, quality assurance, workplace learning opportunities, trainer development, resource provision, support services, industry collaboration, recognition of prior learning, and advocacy. This comprehensive approach aims to ensure the effectiveness, relevance, and accessibility of artisan training programs for a diverse range of learners.

9.1 Cost-drivers for the MICT SETA to Consider

The cost drivers associated with artisan development programs present a significant financial undertaking for the MICT SETA. The most substantial cost is the artisan grant, amounting to R206,290.00 per apprentice, which covers the apprentice's stipend and other training-related expenses. In addition to this direct financial support, the SETA must also consider the costs of promoting these programs to potential employers and apprentices. This includes advocacy campaigns, informational materials, and outreach initiatives to raise awareness and encourage participation.

Furthermore, building capacity within companies to implement artisan training programs is another crucial cost driver. This involves providing training and support to employers on the administrative, logistical, and pedagogical aspects of running an apprenticeship program. The costs associated with researching and developing a

geographical footprint of theory and training providers, as well as mentorship training, also need to be factored in.

The MICT SETA is also responsible for workplace accreditation and quality assurance, as delegated by the QCTO, which entails additional costs for conducting assessments, audits, and monitoring processes. Moreover, the development of new trade-type qualifications necessitates stakeholder workshops to define the scope of these qualifications, followed by the costs of qualification development, provider accreditation, and the creation of external integrated summative assessments (EISAs).

These cost drivers highlight the significant nature of artisan development and the need for a comprehensive and well-funded approach. The MICT SETA must carefully consider these costs when budgeting for artisan training programs and explore potential avenues for cost reduction or optimization, such as partnering with other stakeholders or leveraging existing resources and infrastructure.

10 CONCLUSIONS AND RECOMMENDATIONS

10.1 Conclusions

This feasibility study has assessed the demand for and potential of artisan programs within the MICT sector in South Africa. The research reveals a modest but notable presence of artisans in the sector, with companies showing a willingness to invest in artisan training, albeit on a limited scale. There is a clear demand for artisan training, particularly in existing trades and the development of new qualifications tailored to the telecommunications sub-sector.

The study identified the apprenticeship route as the preferred pathway for artisan development, demonstrating higher success rates in completion and employment compared to other learning programs. While current occupational qualifications may not readily translate into trades, the Telecommunications Cable Jointer and Computer Technician occupations present promising opportunities for artisan-type training, with existing registered qualifications that could be adapted.

Stakeholders believe that artisan training would increase significantly with the provision of funding and structural support. However, challenges such as the need for an adequate provider network, trained mentors, and equipment must be addressed to facilitate successful implementation.

Beyond apprenticeship grants, the MICT SETA would need to invest in advocacy, capacity building, quality assurance for existing trades, and the development and accreditation of new qualifications. By focusing on both existing employees and new entrants, the MICT SETA can establish a sustainable and effective artisan development system that not only fulfills the sector's needs but also contributes to broader economic growth and development in South Africa.

In conclusion, while the funding of artisan development in the MICT sector is limited, there is significant potential in line with employers' skills needs. By addressing the identified challenges and preconditions for successful implementation feasibility can be established. By focussing on both existing employees to allow for career progression of individuals, as well as young people entering employment in the sector, the MICT SETA can create a sustainable and effective artisan development system that not only meets the needs of the MICT sector but also contributes to the broader economic growth and development of the country.

10.2 Recommendations

Based on the findings of this feasibility study, the following recommendations are proposed to facilitate the successful implementation of artisan development programs within the MICT sector:

10.2.1 Strategic Planning and Implementation

- Integrate the findings and recommendations of this feasibility study into the MICT SETA Sector Skills Plan to ensure alignment with broader sector development goals.
- Include artisan development as a strategic priority in the MICT SETA's Strategic Plan and Annual Performance Plan, recognizing its potential to address skills shortages and drive sector growth.
- Implement artisan development programmes in phases, starting with conservative targets and budgets to assess stakeholder appetite and gradually scaling up as capacity and demand increase.

10.2.2 Policy and Funding

- Amend the Discretionary Grant Funding Policy to explicitly include funding for artisan training and streamline the application process for grants.

- Establish MICT SETA policies for apprentice contracting, workplace approval for artisan training, employer guidelines, quality assurance, and mentorship to provide a structured framework for artisan development.

10.2.3 Processes and Capacity Building

- Initiate a comprehensive advocacy campaign to communicate the availability of grants and the benefits of artisan development to MICT SETA stakeholders, fostering awareness and encouraging participation.
- Create a structured capacity-building program to guide employers through the process of implementing artisan training, addressing potential barriers, and ensuring compliance with relevant regulations and standards.
- Develop or procure a mentorship capacity-building program to equip mentors with the necessary skills and knowledge to effectively support and guide apprentices throughout their training journey.
- Organise stakeholder meetings to explore the implementation of existing occupational qualifications as trades and to refine the need for and content of new qualifications, ensuring diverse representation and input from relevant stakeholders.

10.2.4 Infrastructure and Accreditation

- Develop a comprehensive national footprint of theoretical and practical providers of artisan training, collaborating with other SETAs to address any gaps in coverage.
- Proactively communicate the development of new qualifications to potential providers and offer guidance and support to facilitate their accreditation process, ensuring a sufficient pool of qualified training providers.
- Invest in the development of external integrated summative assessments (EISAs) to ensure a standardized and rigorous evaluation of apprentice competencies, aligning with the requirements of the QCTO and industry standards .

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ANNEXURE 1: FOUR STEPS TO BECOMING AN ARTISAN

Artisans are distinguished from other categories of workers by the level of skill employed in work normally related to manufacturing or repair. Artisan work is skilled work in that knowledge connects tasks into procedures, and there is a link between the understanding of isolated components and a whole system's function.

The skills of an artisan are not a simple series of tasks that can be learned. They are a collection of skills that make up an occupation. Occupations change as a result of social, economic and technological developments. Skill entails a level of transferability between different jobs. The training of modern artisans includes much more theory than the traditional apprenticeship would have received. It requires a mix of theory, practical training, and work-based learning.

Trainees in the trades are socialised into occupational as well as social hierarchies in the workplace. They learn where one occupation begins and another takes over and where the roles of semi-skilled and skilled intersect with the intermediate nature of an artisan's role. In South Africa, those hierarchies of skill are informed and reinforced by historical racial and gender imbalances. The challenge in training artisans, post-1994 has therefore been to counteract that historical socialisation.

For many years, the apprenticeship was the dominant pathway for the development of artisans globally and in South Africa. Since 1994, several additional pathways to becoming an artisan have been added to the singular apprenticeship route. The 1998 Skills Development Act introduced learnerships and Artisan Recognition of Prior Learning (ARPL), and since 2010, a major focus has been on engaging the public TVET colleges in the training of artisans.

Now, there are different pathways to becoming an artisan. The Listing of Occupations as Trades for which Artisan Qualifications are Required (Gazette 35625, 2012) states:

- *The route to achieve artisan status … is uniquely characteristic of an artisan occupation and usually includes features such as:*
    - *a structured learning programme of knowledge, practical and work experience;*

- *a structured learning programme that must be successfully completed before a final assessment is attempted; and*
- *a final external summative assessment that must be passed and is known as a trade test.*

Chapter 6A Section 26D of the Skills Development Act, 97 of 1998 states that *no person may obtain an artisan qualification in terms of this Act unless they have successfully undergone a trade test administered by an accredited trade test centre. A person may apply to undergo a trade test in respect of that if:*

a) *that person has completed a learnership relevant to that trade;* [2] *or*
b) *that person has satisfied the relevant requirements of an apprenticeship in respect of that trade; or*
c) *an accredited trade test centre has certified that the person has acquired sufficient prior learning related to that trade; and*
d) *that person has completed any other learning programme resulting in an occupational or vocational qualification inclusive of prescribed work experience that entitles such person to undergo the relevant trade test* (Republic of South Africa, 2008).

The following section is an adaption of an evaluation conducted for the merSETA on the four pathways to becoming an artisan (2020) and subsequently a study conducted by the Labour Market intelligence (2022). The reports describe the four pathways as follows:

Apprenticeships

The distinguishing feature of apprenticeships in South Africa, setting them apart from other training pathways, is the legally binding employment contract between the employer and the apprentice. This contract solidifies the apprentice's status as a company employee throughout the apprenticeship duration, typically spanning three to four years. In certain instances, a "lead employer" may formally employ the apprentice but place them with a "host employer" for practical training.

[2] *Section 1 of the Skills Development Act states that "apprenticeship" means a learnership in respect of a listed trade and includes a trade test in respect of that trade.*

Apprenticeships encompass diverse training methodologies. Some prioritise on-the-job experience and logbook completion, while others integrate structured theoretical and practical training within the company's facilities. Additionally, some apprenticeships allow time off for external training at TVET colleges or private providers. Regardless of the specific approach, all apprenticeships culminate in the completion of a logbook detailing comprehensive work experience across the trade, accompanied by assessments of both theoretical knowledge and practical skills. Upon conclusion of the apprenticeship, the apprentice presents the completed logbook as evidence of work exposure at a trade test centre and undergoes a trade test to evaluate their competency and potentially achieve artisan certification.

Learnerships

The Skills Development Act (SDA) of 1998 introduced learnerships as a new approach to workplace learning, aiming to provide a more structured and systematic alternative to traditional apprenticeships. Learnerships are designed to link structured learning with diverse work experiences, ultimately leading to a nationally recognized qualification. The SDA distinguishes between two types of learners: employed workers (Section 18.1) and unemployed learners (Section 18.2), and learnerships cater to all levels of the National Qualifications Framework (NQF), unlike apprenticeships, which are limited to intermediate levels.

While learners in learnerships are required to have an employment contract in addition to the learnership agreement, the employer-employee relationship differs from that in apprenticeships. Employers often perceive learners as the responsibility of the training provider rather than as employees, as is the case in apprenticeships. In the context of artisan development, learners must complete multiple learnerships based on qualifications at different NQF levels to be eligible for the trade test, which assesses their competency and awards artisan status.

NC(V)4 to Artisan Pathway in the public TVET colleges

Public TVET colleges in South Africa have undertaken various projects to bridge the gap between theoretical and practical training, aligning their programs with trade qualifications and partnering with employers to offer practical experience. The introduction of the National Certificate (Vocational) (NC(V)) program was a significant step in this

direction, aiming to shift college provision away from traditional, narrow trade training models towards a broader vocational education that combines technical skills with a strong general education foundation.

While the NC(V) program was designed to equip students with the theoretical and practical knowledge required for a trade, it did not include the necessary workplace exposure and trade test components for artisan certification . To address this gap, the NC(V)4 pathway was established, enabling students who completed three years of NC(V) training to gain two years of work experience, complete a logbook, and undergo a trade test to become recognised as artisans.

Several TVET colleges with the capacity to train in priority trades partnered with employers to implement a two-year work placement programme. This program involved placing successful NC(V)4 learners with employers who would then provide them with a two-year contract, apprenticeship training, and support through their trade tests. This collaborative approach aimed to provide learners with the necessary workplace exposure and practical skills to complement their theoretical knowledge and ultimately achieve artisan status.

Note: There have been a number of variations of this pathway, including the Dual System Apprenticeship where a person studies for the NC(V) and the trade at the same time and alternates between working for an employer and studying at the college.

Artisan Recognition of Prior Learning (ARPL)

Artisan Recognition of Prior Learning (ARPL) is a process of evaluation conducted at an accredited trade test centre which measures a candidate's capability developed through work experience and enables a worker to take the trade test and become certified as an artisan. This route was instituted for those people who did not have the opportunity to attend the required learning sessions at a training provider and had learned their trade 'on-the-job'.

There are various routes to an ARPL trade test, with differing timeframes and requirements. It is a very flexible system that enables individuals to arrive at the trade test via a wide range of employment and learning experiences. In the merSETA a

grant is given to fund any gap training that the worker needs as well as the cost of the trade test (merSETA, 2020).

All four pathways have been based on aligning the nationally determined policy directions with the interests and requirements of the sector. They have each in different ways enabled the SETA and its stakeholders to respond well to the skills needs of the sector and engage constructively in the various policy shifts that have taken place within the skills development system.

The most successful pathway, and the one most supported by employers, is the 3-4-year apprenticeship. With throughput and pass rates of over 70% it is a demonstrably reliable pathway to a trade and very likely has the best success rate of any group of qualifications delivered in South Africa (MerSETA artisan Pathway study, 2020).

ARPL is also an important pathway, particularly for employed workers. In a sense the SETA manages the pathway, or at least access to the trade test, on behalf of the sector, but does not necessarily fund it.

In the MerSETA artisan pathway study (2020), learnerships - and in this context, solely about those designed to lead to an artisan trade – are not such a successful pathway. It is noted that while learnerships designed to lead to an artisan trade have high pass rates of around 80%, this pathway is not considered successful. The high pass rate refers only to those who complete the full pathway to level 4. However, the primary goal of this pathway is to provide a flexible route to the trade test, and the evidence indicates that throughput is extremely low. A significant issue is the high drop-out rates: most individuals who obtain a level 2 qualification through a learnership do not progress to levels 3 and 4, and consequently, do not take the trade test. Therefore, the 80% pass rate at level 4 excludes a substantial number of participants who drop out at earlier stages, highlighting the inefficiency of the pathway in achieving its intended purpose.

This is not to say that learnerships have no value. Many who gain a qualification through a learnership gain employment and so the skills learned appear to be in demand and do assist people to find work. However, this evaluation is examining the

learnership as a pathway to a trade and in that specific context the learnership has not proven to be a success, except in certain areas and sectors, where the learnerships have been managed well and have buy-in from employers.

In those companies where the system is working well there is strong support for the continuation of the learnerships pathway. Learnerships are viewed by some employers as being more flexible and more manageable than apprenticeships. The learnership is also viewed as paying more attention to the integration of theory and practice than the apprenticeship. It is also important to note that learnerships have been able to achieve better results in terms of gender and race targets than apprenticeships.

The NC(V)4 pathway has been the most difficult to evaluate. This is partly because of the way it was set up and implemented and partly because the limited data available show such mixed results. This pathway was managed and implemented well in some colleges, and not so well in others. The results were very mixed. Trade test passes range from 100% in some colleges to 0% in others. So, in certain circumstances the pathway can be a great success, whereas in other circumstances, it can be a complete failure. The merSETA evaluation has identified the enablers of success and the reasons for some of the failures. The overall conclusion is that the pathway has been an important and useful intervention but needs to be viewed as a pilot that was implemented by the merSETA.

The need for artisans within the various MICT SETA sub-sectors have been researched, and the findings of the research are reflected in this report.

ANNEXURE 2: TABLES ILLUSTRATING THE ANALYSIS OF WSP AND ATR DATA

Table 8: Number of employees by trade under the skilled agricultural forestry, fishery, craft and related trades worker occupational category

Occupation	2022/23	2023/24
Air-conditioning and Refrigeration Mechanic	10	6
Aircraft Structures Worker		2
Apparel and related pattern maker	1	
Armature Winder	3	8
Automotive Engine Mechanic	1	3
Automotive Motor Mechanic	6	
Boiler Maker	12	42
Bricklayer	16	2
Business Machine Mechanic	180	87
Cable and Rope Splicer	5	5
Cable Jointer	473	478
Carpenter	101	97
Carpenter and Joiner	2	9
Civil Engineering Constructor	19	37
Clothing, Home Textiles and General Goods Cutter	3	
Commercial Digital Printer	8	10
Communications Operator	4	13
Computer Engineering Mechanic / Service Person	254	576
Continuous Stationery Printing Machine Technician	21	18
Craft Bookbinding Technician	5	6
Data and Telecommunications Cabler	804	216
Diesel Mechanic	8	22
Diver	3	10
Electrical Equipment Mechanic	9	6
Electrical Installation Inspector	4	21
Electrical Line Mechanic		2
Electrician	250	252
Electronic Equipment Mechanician	202	194
Electronic Originator	6	3
Electronic Pre-press	2	
Fitter and Turner	4	8
Fitter-welder	26	

Occupation	2022/23	2023/24
Food Taster/Grader		1
Floor Finisher	1	
Gas Cutter	2	1
Grinder	3	
Groundskeeper	39	59
Hat Maker	2	
Heat Pump Installer	9	
Heavy Equipment Mechanic	16	14
House Builder	1	2
Industrial Machinery Mechanic	1	1
Industrial Spraypainter	5	12
Instrument Mechanician	109	115
Insulation Installer		1
Landscape Contractor	25	16
Locksmith		2
Mechanical Equipment Repairer	2	4
Mechanical Fitter	51	26
Mechanized soft-cover bookbinding technician	3	1
Mechatronics Technician	183	9
Metal Fabricator	40	57
Metal Machinist	161	69
Millwright	2	2
Moulder	10	2
Optical Mechanic	7	
Painter	51	47
Panelbeater	2	2
Pastry Cook	1	
Picture Framer	10	9
Pipe Fitter	2	4
Plasterer	1	18
Plumber	6	5
Poultry Slaughterer		39
Printing Machinist	19	17
Quality Controller (Manufacturing)	115	58
Radar Mechanic	1	

Occupation	2022/23	2023/24
Rigger	209	164
Roll Label Machine Technician	13	10
Roll Label Rewind Machine Operator	3	3
Roof Tiler	1	
Scaffolder	10	11
Screen Printer	2	4
Sheet Metal Worker	6	18
Shoemaker	2	
Signwriter	1	
Small Offset Lithography Operator	4	1
Solar Installer		7
Special Class Electrician	50	160
Stationery Machine Technician	14	
Stonemason		3
Structural Steel Erector		5
Tailor	60	21
Telecommunications Cable Jointer	382	59
Telecommunications Line Mechanic	308	249
Telecommunications Technician	1 245	1 685
Textile Produce Mender and Embroiderer	5	2
Textile, Clothing, Footwear and Leather Processing Machine Mechanic	2	
Toolmaker	1	3
Transportation Electrician	4	321
Vehicle Body Builder	1	
Vehicle Painter	1	1
Weapon Systems Mechanic	2	1
Welder	42	67
Wig Maker	6	
Grand Total	**5 716**	**5 521**

Source: WSP/ATR data 2022/23, 2023/24

Table 9: Planned training by occupation (for trades) under the skilled agricultural forestry, fishery, craft and related trades worker occupational category as reported by employers in the MICT sector

Occupation	2022/23
Building and Related Trades Workers	**405**
Air-conditioning and Refrigeration Mechanic	4
Bricklayer	323
Carpenter	8
Carpenter and Joiner	2
Painter	4
Plasterer	
Plumber	20
Scaffolder	2
Electrical and Electronics Trades Workers	**11 327**
Armature Winder	3
Business Machine Mechanic	1 054
Cable Jointer	273
Communications Operator	22
Computer Engineering Mechanic / Service Person	718
Data and Telecommunications Cabler	854
Electrical Equipment Mechanic	38
Electrical Installation Inspector	14
Electrician	363
Electronic Equipment Mechanician	94
Instrument Mechanician	250
Lift Mechanic	5
Mechatronics Technician	126
Millwright	7
Special Class Electrician	90
Telecommunications Cable Jointer	132
Telecommunications Line Mechanic	4 140
Telecommunications Technician	3 139
Transportation Electrician	5
Food Processing, Wood Working, Garment and Other Craft and Related Trades Workers	**356**
Cabinet Maker	185
Fruit or Vegetable Preserver	14

Occupation	2022/23
Panelbeater	2
Picture Framer	6
Quality Controller (Manufacturing)	128
Tailor	20
Vehicle Body Builder	1
Handicraft and Printing Workers	**228**
Commercial Digital Printer	7
Continuous Stationery Printing Machine Technician	64
Craft Bookbinding Technician	0
Electronic Originator	97
Electronic Pre-press	4
Printing Machinist	24
Roll Label Machine Technician	8
Roll Label Rewind Machine Operator	1
Screen Printer	1
Stationery Machine Technician	22
Market-oriented Skilled Agricultural Workers	**71**
Agronomy Farmer	57
Groundskeeper	2
Landscape Contractor	12
Metal, Machinery and Related Trades Workers	**321**
Automotive Motor Mechanic	1
Boiler Maker	20
Cable and Rope Splicer	6
Diesel Mechanic	14
Fitter and Turner	14
Fitter-welder	13
Gas Cutter	2
Heavy Equipment Mechanic	14
Mechanical Equipment Repairer	2
Mechanical Fitter	55
Metal Fabricator	1
Metal Machinist	26
Moulder	9
Pressure Welder	53

Occupation	2022/23
Rigger	23
Sheet Metal Worker	7
Welder	61
Grand Total	**12 708**

Source: WSP/ATR data 2022/23

Table 10: Annual Training Report by occupation under the skilled agricultural forestry, fishery, craft and related trades worker occupational category

Occupations	2022/23
Air-conditioning and Refrigeration Mechanic	4
Bricklayer	130
Industrial Spraypainter	4
Business Machine Mechanic	412
Cable Jointer	12
Computer Engineering Mechanic / Service Person	402
Electrician	728
Electronic Equipment Mechanician	285
Instrument Mechanician	713
Mechatronics Technician	7
Millwright	5
Special Class Electrician	9
Telecommunications Cable Jointer	54
Telecommunications Line Mechanic	1 190
Telecommunications Technician	4 213
Cabinet Maker	350
Fruit or Vegetable Preserver	30
Tailor	14
Continuous Stationery Printing Machine Technician	20
Electronic Originator	194
Diesel Mechanic	7
Fitter and Turner	6
Rigger	24
Welder	56
Grand Total	**9 040**

Source: WSP/ATR data 2022/23