



diversITy Series

# Promoting e-skills training for a diverse tech workforce

Country report for South Africa

February 2019

## Terms of use and disclaimer

The *diversITy* series of reports presents information collected and compiled by empirica, supported by J.P. Morgan, on the technology skills training landscape in seven target countries: Spain, Germany, the United Kingdom, Ireland, Poland, France and South Africa. External sources of information and data have been credited accordingly where applicable.

The term *Information and Communications Technology (ICT) sector* used in this report refers to the technology or digital sector in all target countries.

The term *ICT skills* used in this report comprises two main categories:

*ICT user skills*: the capabilities required for effective application of ICT systems and devices by the individual. ICT users apply systems as tools in support of their own work, which is, in most cases, not ICT. At the general level, they cover “digital literacy”: the skills required for the confident and critical use of ICT for work, leisure, learning and communication.

*ICT practitioner skills*: The capabilities required for researching, developing and designing, managing, producing, consulting, marketing and selling, integrating, installing and administering, maintaining, supporting and servicing ICT systems.

The term *ICT skills training* refers to programmes and initiatives aimed at improving or upgrading peoples’ skills and knowledge in ICT user and practitioner skills.

The term *ICT specialists* refers to the European Commission’s definition of ICT specialists as workers whose main job involves ICT and who can deal with a wide range of tasks concerning corporate ICT systems. The terms *ICT specialists* and *ICT workers* are used interchangeably in this report.

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## Preface

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The diversITy project carried out an evaluation and assessment of ICT skills and training programmes to support diverse populations to enter the labour market. It identified and analysed ICT training programmes that aim to prepare and place jobseekers into meaningful tech jobs, with a focus on diverse target groups, including women, youth at risk of social exclusion or from difficult socio-economic backgrounds, migrants or unemployed adults changing careers. The target countries are Germany, France, the United Kingdom, Ireland, Spain, Poland and South Africa.

The work product of the diversITy project informs policy development on the European and national level and provides practical recommendations to non-profit organisations and training providers. An initial assessment and evaluation of identified ICT skills training programmes in the target countries produced a repository of 96 inclusive programmes. Brief descriptions of these 96 cases are available on the diversITy online repository, which can be accessed at [www.eskills4diversity.com](http://www.eskills4diversity.com). In addition to the online repository of cases, we produced seven country reports for each target country, discussing in-depth each country's ICT skills gap and unique training landscape. In each report we showcase a set of best practices, setting a benchmark for other training providers to learn from. Rounding off our series of diversITy country reports is a final report, summarising the key findings from the target countries, reporting strengths and weaknesses of various approaches, and identifying challenges and recommendations for ICT skills training programmes as well as policy makers.

The diversITy project is part of the J.P. Morgan New Skills at Work initiative that aims to identify strategies and support solutions that help improve labour market infrastructure and develop the skilled workforce globally. This \$250 million five-year global initiative, first launched in December 2013, brings together leading policymakers, academics, business leaders, educators, training providers and nonprofits with the goal of connecting labour market policy with practice, supply with demand and employers with the workforce.

We greatly acknowledge the support and collaboration of J.P. Morgan to produce this report.

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## Executive summary

- In spite of a high unemployment rate, South Africa faces a critical shortage of ICT specialists. Industry continuously struggles to recruit suitably qualified candidates equipped with the required skills, particularly in technical fields such as ICT. A closer collaboration between industry and universities / training institutions is essential to meet evolving skills demand of industry driven by existing and emerging digital technologies
- The technical and vocational education and training (TVET) sector is particularly ill-equipped for producing the type of ICT skills demanded by employers given that qualifications in these types of colleges do not go beyond NQF Level 4 and are not recognised by universities and employers in the ICT sector. The weaknesses of the current system of skills development are well-acknowledged; plans for revising the system exist, but progress has been slow.
- There are unequal opportunities available to different parts of the population for joining the ICT workforce. The by far biggest under-represented group are Black Africans, Coloured (mixed race) and Indians. Only 43% of South Africa's Media, Information and Communication Technologies (MICT) workforce are Black Africans, against a share of 78% in the economically active population.
- Available data also suggest that the ICT workforce's gender balance is skewed towards males. In university education, computer and information sciences is the field of study with the lowest share of women after military sciences and engineering.
- The South African government has embarked on a range of policies to increase access to ICT training and education and to step up production of digital skills.
- Neither the size nor the nature of existing ICT training programmes targeting young persons from groups currently under-represented in the ICT workforce is sufficient to tackle the digital skills shortage and to significantly improve the inclusiveness of the ICT workforce. Stronger, concerted efforts from all stakeholders are required.
- A range of initiatives by NGOs and private companies are trying to fill the gap left by South Africa's ineffective national ICT training system, especially in the vocational education and training sphere. Results are promising, but limited in overall impact because of their scope in relation to the size of the challenge.
- The lack of skilled candidates was reported as the main reason given for the hard to fill vacancies in the MICT sector, which marked 2.9% of total employment in 2017.

### The ICT labour market in South Africa

**South Africa's ICT sector will employ between 290,000 and 350,000 workers in 2025, up from 250,000 in 2015.**

Estimations are made based on Adelzadeh (2017) model calculation on the forecasted MICT sector employment in 2025. The 2015 figure translates into 2.2% of the country's total labour force – roughly the same share as the average for the EU and China but significantly higher than in the other BRICS countries India, Russia and Brazil. While no data is available for the number of ICT specialists working in other sectors of the economy, dependence on advanced ICT skills is expected to grow significantly across most parts of the country's economy in the coming years<sup>1</sup>.

**Employers find it increasingly difficult to source the skills needed on the labour market**, which is reflected in high numbers of hard-to-fill vacancies. The MICT sector reported a 2.9% hard to fill occupations as a percentage of total employment. The list of top 10 occupations with hard to fill vacancies in the MICT sector includes: Software developer; Computer Network and Systems Engineer; ICT Systems Analyst; Programmer Analyst; ICT Security Specialist; Business Analyst; Multimedia Designer; Advertising Specialist; Database Designer and Administrator; and Telecommunications Network Engineer. 75% of senior ICT managers report that the ICT skills shortage is having a major effect on their business. Lack of skilled candidates is the reason most often reported for problems in filling over 63% of occupations in need.. 9% of all cases cite "employment equity considerations" as the main cause, which points to

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<sup>1</sup> Schofield, A. (2017)



difficulties in finding the right skills among the non-white labour force.

**South Africa's education system faces severe problems in producing the ICT skills demanded by employers.** This applies in particular to the Technical and Vocational Education and Training (TVET) system. In university education, total ICT graduate numbers have increased significantly since 2009, from 3,800 to over 5,300, but only a small share of these advance beyond the bachelor or equivalent level. Employers complain that fresh graduates lack fundamental skills needed for operating in a business environment. Recruitment of young persons who have completed TVET (for entry level positions) is generally not considered a viable option due to substandard level of training provided by many of these colleges.

**In terms of gender equality, South Africa is well ahead of most other countries at similar levels of economic development.** Overall, South Africa has achieved near gender parity in professional and technical roles. Women are still significantly underrepresented, however, among ICT and engineering students: Currently only 13% of STEM graduates are women. The little evidence available also indicates marked gender imbalances in senior ICT specialist positions.

### The policy response

**Progress has been made in policy formulation on strengthening what the South Africa government calls supply-side ICT skills,** i.e. ICT specialist skills, which has resulted in two National e-Skills Plan of Action (NeSPA) in 2010 and 2012. Actual numbers of persons trained in ICT specialist skills have not yet increased sufficiently, however, to mitigate the problems facing employers who seek to recruit ICT skilled staff.

**The mechanism used to fund skills development in South Africa is known as the levy-grant system.** Employers pay a levy for skills development, and 80% of this pool of funds is passed to the Sectoral Education and Training Authorities (SETAs). They distribute a portion of the levy funds to contributing employers for training provided to their workers. The ICT professions are managed by the Media, Information and Communication Technologies (MICT) SETA. The levy-grant system is criticised for not achieving its objectives.

**MICT SETA has established new learning interventions to help tackle ICT skills shortages.** These include Internships, Learnerships and Skills Programmes, all of which use work placements as essential tools for equipping learners with the soft skills essential for

operating in a modern business environment. Their number has increased continuously, from about 3,900 in 2011 to 12,700 in 2016. Further growth is needed, as well as an emphasis on quality: There is evidence that the majority of Learnerships currently being undertaken are at NQF<sup>2</sup> level 3, and as such do not qualify even for an entry-level ICT job. Greater alignment of training offers with employer demand is urgently needed.

**The South African government stresses inclusion and diversity as a horizontal topic across all policy areas,** in the tradition of policy-making since the end of apartheid. The country has a framework for affirmative action designed specifically to rectify some of the inequalities resulting from the legacies of South Africa's colonial past and the discriminatory practices during apartheid. Legislation has been developed which requires positive or affirmative measures to attract, develop and retain individuals from previously disadvantaged groups. Employers are required to take effective measures to ensure improved representation of black Africans also in fields traditionally dominated by white workers, as in the ICT sector. Compliance is measured on the Broad-Based Black Economic Empowerment (B-BBEE, see Section 3) Scorecard.

### Industry-driven training programmes

**Several companies from the ICT and related industries offer inclusive ICT training programmes dedicated to disadvantaged groups.** These are usually initiatives funded from the companies' Corporate Social Responsibility (CSR) budget. Examples include:

- T-Systems, in co-operation with the Good Work Foundation, an international NGO, operates the Hazyview Digital Learning Centre (HDCL), which targets students from disadvantaged backgrounds.
- Sci-Bono Discovery Centre, an NGO, co-operates with SAP, the ICT multinational, to adapt the 'Simplon' programme from the original French version for implementation in Gauteng Province, targeting youth from disadvantaged backgrounds.
- SAP also operates SAP Skills for Africa, a 3-months scholarship programme targeting fresh,

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<sup>2</sup> The NQF in South Africa consist of 10 levels divided into three categories; Levels 1 to 4 equate to high school grades 9 to 12 or vocational training, 5 to 7 are college diplomas and technical qualifications, 7 to 10 are university degrees

talented and unemployed graduates who cannot afford commercial SAP education.

- EOH, a large consulting, technology and outsourcing company, operates the EOH Youth Job Creation Initiative which provides MICT-SETA accredited training to disadvantaged youth over a period of 12 months.

**For persons who face difficulties in entering the ICT workforce, Learnerships offered by ICT companies are of particular value**, as they expose participants to the business environment and thereby serve as an entrance into the industry. Learnerships are work-based learning programmes directly related to an occupation such as for i.e. IT technician, and offered under the auspices of MICT SETA. This is a route to a NQF registered full qualification. Learnerships combine a structured learning component with practical work experience that is acquired while being employed in a company, government department or small business. Learnerships have been shown to increase access to

employment opportunities and to assist in career-pathing and self-development. For the employer, offering Learnerships to black Africans has the advantage of earning Empowerment credentials and B-BBEE points for the company. More generally Learnerships can be used as a vehicle to address employment equity targets and to help fill identified skills gaps.

#### NGO-driven training programmes

**South Africa has a large number of NGOs that are active in providing training to young people from disadvantaged backgrounds**, including trainings focused on advanced digital skills. Most if not all of these are facing the challenge of making funding arrangements more permanent. Private sector donors tend to renew decisions about funding individual programmes every few years, based on performance but also on factors unrelated to the level of the initiative's success.

### Key Recommendations

#### Secure stronger input from industry in development of learning interventions

- Current programmes such as Learnerships need to be reviewed and new ones developed in a process of close collaboration between MICT SETA (and other skills bodies where relevant), training providers and employers. The aim is to foster development of appropriate qualifications which match to the current demand in the job market.

#### Stronger multi-stakeholder partnership at local level

- Building partnerships in which state agencies such as MICT SETA work closely with employers and other stakeholders is a tried-and-tested way to increase the responsiveness of colleges to local labour markets.
- Partnerships at the local level might be most appropriate for developing cross-sectoral partnerships and projects in the delivery of learning interventions.

#### Expand opportunities for work-integrated learning

- Private sector companies should step up co-operation with MICT SETA for offering Learnerships and Internships to people for groups currently under-represented in the ICT workforce.
- There needs to be more exchange of experience and best practice between companies active in this area.

#### Explore innovative ways to increase private business investment in ICT training



- Pay for Performance funding mechanisms should be explored as an incentive for South African companies to invest in ICT training of youth from a disadvantaged socio-economic background.
- The Broad Based Black Empowerment Scorecard system should be used to create incentives for the outsourcing of ICT training to NGO-driven training programmes.

#### **Boost quantity and quality of ICT training at TVET colleges**

- The TVET pathway into ICT careers should be strengthened not only by increasing the input of colleges but also by improving the quality of their output. Evaluators have emphasised the need to update the curricula to industry standard, improve the low certification rates and improve management staff training and their attitudes.<sup>3</sup>
- Investments in TVET colleges in underserved areas, e.g. in former townships, should put a special emphasis on ICT training because of the latent demand for advanced ICT skills in the labour market, too.

#### **Improve the capacity of SMEs to provide inclusive ICT training**

- The large numbers of SMEs that employ ICT specialists require targeted support for empowering them to offer Learnerships or provide other types of ICT training to jobseekers.
- MICT SETA should follow through with its idea to win over established larger companies in the sector to mentor smaller companies that are willing to engage in training provision.

#### **Putting more emphasis on soft skills**

- Employers request ICT graduates who do not only come with the technical knowledge and practical skills required for the job, but also with workplace readiness in terms of interpersonal and self-management skills. This needs to be fully reflected in all training programmes.
- Stronger use should be made of mentoring programmes, e.g. for supporting members of groups currently under-represented in the ICT workforce such as women during their education.
- Innovative mentorship models should be explored. This could include train-the-mentor schemes in which seasoned employees working for multinationals in a developed country give active support to mentors who work in the same company's South African branch.

#### **Make career advice more effective and step up online promotion**

- More efforts are required for establishing effective career advice, including set-up of MICT SETA offices in each college with ICT training programmes.
- These offices could also build relationships with local schools in order to streamline promotional activities and attract young persons as early as possible to the ICT field.
- Targeted use should be made of cost-efficient ways to reach young people via their preferred channels of communication (e.g. social media).

#### **Urgent need for better data, evaluation**

- There is an urgent need for better data to give stakeholders vital insight into the size and nature of digital skills shortages, employer investment in training, and the outputs of the country's education and training system. This may require establishment of a new, central coordinating body, as SETAs have not yet been able to fill the role.
- A commitment to thorough evaluation needs to be mainstreamed across all training interventions in the ICT domain, especially in terms of impact on employability.

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<sup>3</sup> Mason, R.B., Mbambo, S.N. & Pillay, M.A.: Service quality at technical and vocational education and training colleges: perceptions according to demographic factors. In: Journal of Technical Education and Training (JTET), Vol. 10, No.1, June 2018: "Clearly most students have high expectations of the service they want to receive and most students feel that they are not receiving this desired level of service. In other words, students are receiving a poor level of service and it does not appear as if any particular demographic is being discriminated against in terms of service level. This implies that it is not the nature of the student that is attracting poor quality service, but that poor service appears to be endemic at TVET colleges. It is probably therefore that the poor service quality is due to inadequate systems, inadequate administrative staff training, demotivated staff, or staff with inappropriate attitudes being employed. This further implies that the management of the colleges may be unprofessional and inadequate, as strong and professional educational management should have addressed these issues."

# Introduction

In spite of an extremely high rate unemployment, South Africa faces a critical shortage of ICT specialists. The production of supply-side ICT skills suffers from challenges of both quantity and quality. The technical and vocational education and training (TVET) sector is particularly ill-equipped for producing the kind of ICT skills demanded by employers. Such shortcomings are reflected in the unequal opportunities available to different parts of the population to join the ICT workforce. Against this background, stakeholders have embarked on initiatives that utilise ICT training as a means to support members of groups currently under-represented in the ICT workforce, such as Black people (including African, Coloured (mixed race) and Indians) and people with disabilities. We conducted a comprehensive survey to determine the impact and challenges of inclusive e-skills training programmes for diverse groups to enter the digital labour market in South Africa. In this report, we provide an analysis of our main findings.



## Introduction

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South Africa's population consists largely of young people – two in three persons in the country are below 35 years old. While living conditions for South Africans have significantly improved in the last decades, inequality is easily identifiable along racial lines in the country and remains a key challenge despite a very high level of social transfers. Unemployment is a constant problem, especially for those with low educational attainment. About 2 million young people aged between 19-24 years are neither employed nor in education or training (NEET).<sup>4</sup>

Around 50% of learners in South Africa dropout before reaching grade 12 (mainly in grades 10 and 11).<sup>5</sup> According to the results of the General Household Survey 2016, there has been an upward trend in the percentage of individuals who completed Grade 12 (matric<sup>6</sup>). Statistics indicate that in 2016, 50% of the learners who started schooling 12 years earlier were able to pass the 'matric' qualification written at the end of grade 12. However, this leaves the other 50% of young South Africans with no school-leaving certificate and effectively dropped out of school. These statistics put South Africa in an unfavourable position compared to other BRICS<sup>7</sup> countries (with the exception of India which has 33% graduation rate). For instance, Brazil has a graduation rate of 65%, Russia 98%, China 86%. Also, significant differences are observed when looking at dropout levels by race: only 46.7% of black Africans and 51.5 % of Coloured Youth aged 22-25 had attained matric in 2016, compared to 86.5% of Indian/ Asian youth and 83.4 of White youth. This pattern has remained consistent across the years.<sup>8</sup>

There is a general consensus in the literature reviewed by Hartnack (2017) on the school system quality being a particularly important causal factor contributing to the dropout, especially after grade 9. Around 75% of learners from South Africa are from low social-economic status and attend schools which

offer a poor quality education (i.e. have low quality of teaching; include large class sizes, lack necessary resources, etc.)

The education and training of young people faces further challenges due to ethnic inequalities in access to education, a result of South Africa's Apartheid past. During Apartheid the eleven 'historically black universities' existing in the country had no engineering faculties. Because black students were excluded from White universities, Blacks (the category includes Africans, Coloured people (mixed race) and Indians) had no access to technical and engineering education beyond secondary school.<sup>9</sup> Today non-Whites are still seriously under-represented among ICT students.

This partly explains why today, in spite of galloping unemployment, South Africa faces a critical shortage of ICT specialists. An article in *Brainstorm*, a renowned national business magazine, in August 2017 provocatively wrote that "the South African IT industry doesn't have a skills issue or a skills problem: it has a full-blown skills crisis. And if it doesn't do something about it quickly, the entire industry will suffer a slow and agonising decline. And that's the optimistic scenario"<sup>10</sup>. The South African government is in full agreement about the need to develop the country's ICT-related human capital: The SA Connect policy strategy states that "perhaps the greatest gap for South Africa is overcoming human development and having the skills base necessary to operate a knowledge economy. This is demonstrated in South Africa's low ranking on global indices such as the Human Development Index and the World Economic

Forum's Global Information Technology Report".<sup>11</sup> South Africa's global e-readiness rankings have slightly improved from 70th in 2013 to 65th in 2018 (out of a total of 140 countries, among which, Brazil is in 72<sup>nd</sup> position, Russia 41<sup>st</sup>, India 91<sup>st</sup>, and China 19<sup>th</sup>).

Progress has been made in policy formulation on strengthening what the South Africa government calls

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<sup>4</sup> Field et al. (2014) 'A Skills beyond School Review of South Africa'.

<sup>5</sup> Hartnack (2017)

<sup>6</sup> The minimal qualification in South Africa is the National Senior Certificate or 'matric', written at the end of grade 12

<sup>7</sup> OECD (2019) Graduation rates, entry rates and average ages

<sup>8</sup> General Household Survey: Focus on Schooling 2016

<sup>9</sup> Kahn (n.a.) 'Science, Technology, Engineering and Mathematics (STEM) in South Africa'

<sup>10</sup> van der Merwe (2017) 'IT skills shortage choking SA business'

<sup>11</sup> Department of Communications (2013) 'South Africa Connect', p. 24.

supply-side ICT skills, i.e. ICT specialist skills, which has resulted in two National e-Skills Plan of Action (NeSPA) in 2010 and 2012. Actual numbers of persons trained in ICT specialist skills have not yet increased sufficiently, however, to close the ICT skills gap.

The quality of education provision more generally is frequently mentioned as a barrier to development of the country. The OECD 2017 Economic Survey notes that “despite increased spending to broaden access to education, low quality is limiting access to jobs”. The OECD considers development of an effective vocational system as particularly urgent, as it would “help in addressing skills shortages and redirecting the youth back into training. Only 12% of South African students in upper secondary education were enrolled in vocational programmes in 2013. The technical and vocational education and training (TVET) sector can be further strengthened in terms of qualifications and training of staff, resources and curriculum content to make it more viable and attractive to students and businesses”<sup>12</sup>. Access to higher education is limited by rising university fees, a result of universities having to deal with increasing enrolment rates while government teaching subsidies have not increased in line.<sup>13</sup> A sustainable financing scheme for higher education is not yet in place.

This is reflected in the unequal opportunities available to different parts of the population to join the ICT workforce. Lack of diversity is generally understood to refer, most of all, to representation of black population (including African, Coloured (mixed race) and Indians), as well as to women and people with disabilities. In the tradition of policy-making since the end of apartheid, the South African government stresses inclusion and diversity as a horizontal topic across all policy areas. In this context, the country has developed a framework for affirmative action designed specifically to rectify some of the inequalities resulting from the legacies of South Africa’s colonial past and the discriminatory practices during apartheid. In this spirit, legislation has been developed which requires positive or affirmative measures to attract, develop and retain individuals from previously disadvantaged groups. This means that the need for workforce diversity in South Africa is not only based (as it is in most other countries) on principles of corporate social responsibility and non-

discrimination, but also on a legal requirement to take affirmative action to increase the share of “previously disadvantaged groups” in the workforce, including in senior positions. In practice, employers are asked to take effective measures to ensure improved representation of black population also in fields traditionally dominated by white workers, as in the ICT sector.

In terms of gender equality, South Africa is well ahead of most other countries at similar levels of economic development. On the World Economic Forum’s Global Gender Gap Index, South Africa ranks 15<sup>th</sup> out of 144 countries covered. This is reflected in the fact that “South Africa – overall – has achieved gender parity in professional and technical roles (at the skills employment level there is gender parity)”<sup>14</sup>. Women are still significantly underrepresented, however, among ICT and engineering students: Currently only 13% of STEM graduates are women.<sup>15</sup>

Against this background, stakeholders from outside of the formal education system have embarked on initiatives that utilise ICT training as a means to support members of groups currently under-represented in the ICT workforce, such as black population and people with disabilities.

South African employers are looking for software developers and other types of ICT workers. Strengthening demand is evident specifically in the ICT sector. The ICT sector is the economic sector with the by far highest demand for ICT skilled workers.<sup>16</sup>

ICT workers and technicians belong to the skills hardest to find in South Africa. The following reasons were given as the most likely causes of your hard-to-fill vacancies in the CompTIA South Africa State of ICT Skills Survey of employers in 2018.

Not enough suitably skilled people :	43.9 %
Company doesn’t pay enough :	14.0%
Lack of the work experience you demand :	12.3 %

<sup>14</sup> World Economic Forum (2016) ‘Global Gender Gap Report 2016’, <https://www.biznews.com/wef/2016/10/27/gender-equality-wef/>

<sup>15</sup> *ibid.*

<sup>16</sup> BusinessTech: These are the most in-demand jobs skills in South Africa right now, 18 November 2018

<sup>12</sup> Field et al. (2014), p. 19.

<sup>13</sup> *ibid.*, pp. 29-30.

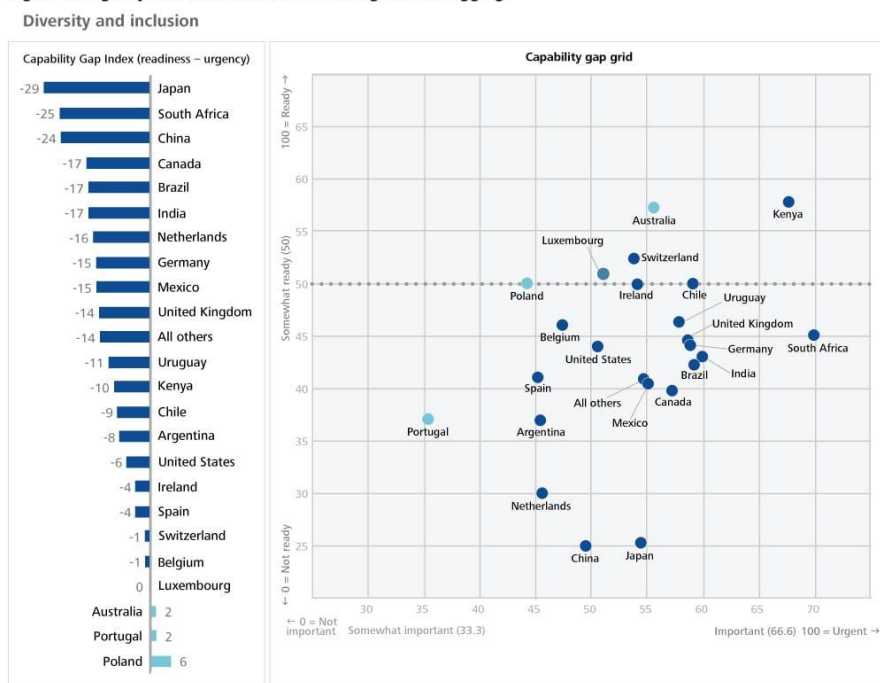


Lack of the qualifications that you demand or require :	5.3 %
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The results clearly indicate a strong need for ICT skills training and development. The same survey also revealed that ‘experience’ is the main recruiting criteria (83.9%) followed by ‘vendor certifications’ (42.9 %), ‘references’ (28.6 %) and ‘university degree’ (17.9 %).

From the results of a global survey by Deloitte, it becomes apparent that only one company in five (20 percent) believes it is fully “ready” to address the issue of diversity and inclusion. The gap between the urgency of this trend and companies’ readiness to address it is particularly wide in Japan, South Africa, and China.<sup>17</sup>

**Figure 1. Urgency vs. readiness: Who is leading, who is lagging?**



Graphic: Deloitte University Press | DUPress.com

#### The Human Capital Capability Gap Index

The Deloitte Human Capital Capability Gap Index is a research-based index that shows HR's relative capability gap in addressing a given talent or HR-related problem. It is computed by taking an organization's self-rated “readiness” and subtracting its “urgency,” normalized to a 0–100 scale. For example, if an organization feels that an issue is 100 percent urgent and it also rates itself 100 percent capable and ready to address the issue, the capability gap would be zero. These gaps, which are almost always negative, can be compared against each other.

#### The capability gap grid

By plotting the gaps on a grid (with readiness on the vertical and urgency on the horizontal), we can see how capability gaps vary among different countries and industries.

- Capability gaps at the lower right part of the grid are those of high urgency and low readiness (areas that warrant major increases in investment).
- Capability gaps at the upper right part of the grid are highly urgent, but companies feel more able to perform in these areas (they warrant investment but are lower priority than those at the bottom right).
- Capability gaps on the left side of the grid are areas of lesser importance, and those lower in the grid are areas of less readiness.

<sup>17</sup> Bourke, J. et al.: From diversity to inclusion. Move from compliance to diversity as a business strategy. 7<sup>th</sup> March 2014: <https://www2.deloitte.com/insights/us/en/focus/human-capital-trends/2014/hc-trends-2014-diversity-to-inclusion.html?id=gx:el:dc:dup681:cons:awa:hct14>



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# ICT Skills Forecast

South Africa's ICT sector employs about 250,000 persons, which translates into about 2.2% of the country's total labour force – roughly the same share as the average for the EU and China but significantly higher than in the other BRICS countries India, Russia and Brazil. It is expected that by 2025 the sector will employ between 290,000 and 350,000 workers. Employers find it increasingly difficult, however, to source the skills needed on the labour market, which is reflected in high numbers of hard-to-fill vacancies. 75% of senior ICT managers report that the ICT skills shortage is having a major effect on their business. While lack of skilled candidates is the reason most often reported for problems in filling vacancies, for 9% of all cases "employment equity considerations" are the main cause, which points to difficulties in finding the right skills among the Black labour force. South Africa's education system faces severe problems in producing the ICT skills demanded by employers. This applies in particular to the Technical and Vocational Education and Training (TVET) system. In university education, total ICT graduate numbers have increased significantly since 2009, from 3,800 to over 5,300, but only a small share of these progress beyond the bachelor or equivalent level.





## Baseline figures and forecast for South Africa

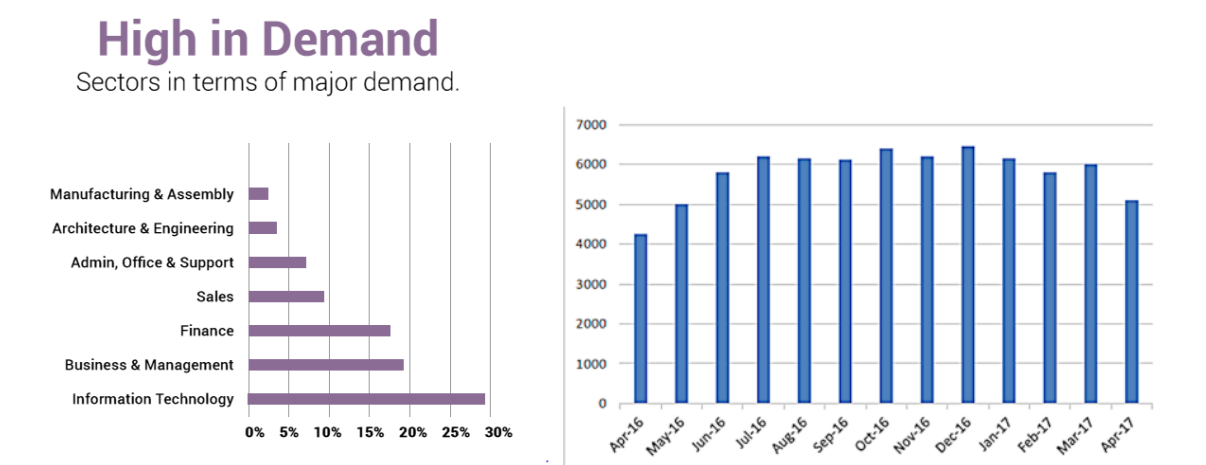
### The ICT skills challenge for South Africa

For many years already, industry observers in South Africa have complained that the country's ICT sector is affected by large unmet demand for skilled labour. This is confirmed by the analysis of CareerJunction, an online job site (see Figure 1). The source reports that software developers are most highly sought after, particularly those with Java and C+ skills. The total number of ICT sector vacancies, according to this source, exceeded 6,000 for most of 2016 and early 2017. Another source, the Robert Walters South African Jobs Index which charts vacancy numbers posted to online platforms, indicates that the IT sector has seen the highest year-on-year growth in the number of advertised roles amongst all other sectors: "IT job vacancies have shot up by 38% between the first quarter of 2016 and 2017, with technical and specialist IT professionals in the highest demand. [...] IT professionals with technical and specialist skills sets with experience in systems and languages are in high demand within the South African job market. [...] Developers, programmers and specialised software subject matter experts continue to be highly sought after".<sup>18</sup>

In 2017, Media, Information and Communication Technologies (MICT) sector employers reported 2.9% hard to fill occupations as a percentage of total employment,<sup>19</sup> which translates into about 7,200 vacancies. 63% of these are for the category "professionals", 29% for "technicians and associate professions" and 3% for "managers".<sup>20</sup> While lack of skilled candidates was the reason most often given for the problems in filling vacancies, for 9% of all cases "employment equity considerations" were reported.<sup>21</sup> The latter issue is of particular relevance for the topic of the present report, as South African legislation means that employers are obliged to take account of diversity when recruiting ICT specialists.

MICT SETA, the sector's Education and Training Authority, created a list of ICT occupations affected by shortages, including estimations of how many each of these would be required in the near future (2018/19). The table below represents top occupations in the ICT sector with hard-to-fill vacancies, due to difficulties employers across the sector experience in recruiting skilled or qualified people.

**Figure 1 Sector's share in total vacancies (February 2018) and number of vacancies in ICT (2016-2017)**



Source: CareerJunction

<sup>19</sup> MICT SETA (2017)

<sup>20</sup> "Professionals": NQF level 7-10; "Technicians and Associate Professionals": NQF level 6; "Managers": NQF level 6-10 based on skills levels related to OFO groups. See Department of Higher Education and Training, Republic of South Africa (2015)

<sup>21</sup> ibid.

<sup>18</sup> Moyo (2017) 'SA sees spike in IT job vacancies', n.p.

**Table 1 Top occupations with hard to fill vacancies in the ICT sector (and the quantity needed)**

Occupation	Specialisation/ Alternative title	NQF level	Quantity needed 2018/19
Software developer	Information Architect, Software Architect, Software	6	1131
Computer Network and Systems Engineer	Communications Analyst (Computers), Computer Network Engineer, Computer Systems Integrator, Computer Systems / Service Engineer, Network Engineer, Network Programmer / Analyst, Network Support Engineer Systems Engineer, Systems Integrator, ICT Customer Support Officer	5	352
ICT Systems Analyst	Capacity Planner Computing, Computer Analyst, ICT Business Systems Analyst, ICT Systems Advisor, ICT Systems Architect, ICT Systems Consultant, ICT Systems Contractor, ICT Systems Coordinator, ICT System Designer, ICT Systems Specialist, ICT Systems Strategist, Internet Consultant / Specialist, LAN / WAN Consultant / Specialist, Systems Programmer	5	316
Programmer Analyst	Architect (Applications / Call Centre / Computing / Desktop / Ecommerce), Education Systems Coordinator, Designer (Hardware - Digital / Software), Engineer (Applications / Content / IT / Software / Systems / WAN), Architect (Enterprise / Internet / IT / Network / Software / Unix / Web), Software Configuration / Licensing Specialist, Database Designer	5	165
ICT Security Specialist	Security Administrator, Internet Security Architect / Engineer / Consultant, Database Security Expert, ICT Security Architect, Information Technology Security Manager	6	150
Business Analyst	Management Consultant, Financial Systems Advisor, Business Support Project Manager, Operations Analyst, Management Consulting Specialist, Business Consultant, Management Reporting Analyst, Resource Development Analyst	6	126
Multimedia Designer	Instructional Designer, Interactive Media Designer, Digital Media Designer, Multimedia Artist	7	121
Telecommunications Network Engineer	Telecommunications Network Planner, Communications Consultant, Telecommunications Specialist, Telecommunications Consultant	7	91
Database Designer and Administrator	Database Administrator, Database Analyst, Ecommerce Technical Architect, Data Administrator, Database Architect	5	71

*Source: MICT SETA (2017)<sup>22</sup>*

Employer surveys undertaken on behalf of MICT SETA found that stakeholders in the sector “are increasingly requiring that people have more generalist rather than specialist skills”. As it stands, the majority of employers working across all MICT sub-sectors are found lacking critical skills necessary to keep abreast of the latest developments and rapidly emerging technologies. This requires employers to implement various skills development interventions to address critical skill gap areas including management and leadership skills; customer service skills; technical skills and production efficiency skills.<sup>23</sup>

Outside of the MICT sector, large numbers of ICT specialists are working in other sectors such as in banking and other financial services.<sup>24</sup> The Sector

Education and Training Authorities responsible identified a range of ICT skills which are hard to fill such as, in the banking sector:

- Chief Information Officer
- Software Developer
- ICT Security Specialist
- Database Designer and Administrator
- ICT Systems Analyst
- Systems Administrator
- Programme Analyst
- Developer Programmer
- ICT Communications Assistant.

There is no indication available on the above listed hard-to-fill ICT occupations, whether these are university level of VET occupations. It should be noted here that the SETAs, South Africa’s Sector Education and Training Authorities, have been criticised widely by stakeholders in the country for failing to publish reliable data about skills shortages. The actual extent

<sup>22</sup> MICT SETA (2017)

<sup>23</sup> *ibid*

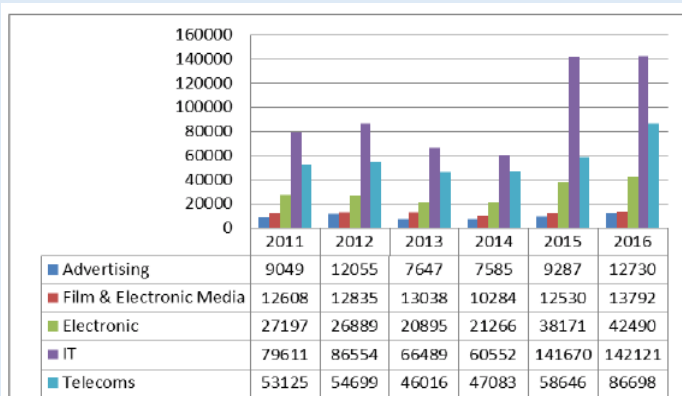
<sup>24</sup> See the discussion in: Schofield, A. (2017) ‘2017 JCSE ICT Skills Survey’

## Box 1 Snapshot: South Africa's ICT Workforce

As no data is available about the ICT workforce and its composition across all of South Africa's economic sectors, this section reports on the workforce in the ICT sector, which is part of the Media, Information and Communication Technologies (MICT) sector.

South Africa's ICT sector is the largest in Africa and contributes approximately 8.2% to South Africa's GDP.<sup>25</sup> The IT and telecommunications sectors combined employ about three in four MICT sector employees (77%).

**Figure 2 MICT sector employment according to WSP submissions 2011-2016**



The number of employees in the sector can be estimated using workplace skills plan (WSP) submissions, see Figure 2<sup>26</sup>. It appears that there has been significant employment growth in the IT and telecommunications sectors over recent years: Their combined workforce according to this data source was 229,000 in 2016, up from 133,000 in 2011.

Other sources have calculated estimates of the total MICT sector employment using the MICT SETA data as input. Adelzadeh's results

are presented in Table 2. According to this source, the most reliable available, the ICT sector employed about 250,000 persons in 2015, which translates into about 2.2% of the country's total labour force (formal sector only, excluding agriculture).

In the absence of detailed data on occupational sub-groups in South Africa's ICT workforce, the analysis carried out by the World Economic Forum of LinkedIn data for the entire continent gives some indications about the economic sectors employing ICT specialists<sup>27</sup>. ICT graduates across all sub-degrees are most likely to work in the software sector, with the exception of interaction designers who are mainly employed in the architecture sector. The FIRE sector (finance, insurance and real estate) as well as other business services companies are among the other sectors that employ large numbers of ICT graduates in Africa.

Some key indicators on South Africa's ICT workforce are presented in the Table 3 below. The data shows - amongst others - that even if all tertiary education ICT graduates leaving university each year would aim at a job in an ICT occupation a substantial number (more than 25%) of ICT vacancies would remain open.

**Table 2 MICT and estimated ICT sector employment, 2015**

Occupations	MICT 2015		ICT 2015 (estd.)	
	absolute	in %	absolute	in %
Manager	38,618	11.90%	29,736	11.90%
Professional	22,094	6.80%	17,012	6.80%
Technician	26,344	8.20%	20,285	8.20%
Clerk	48,873	15.10%	37,632	15.10%
Sales and services	52,886	16.40%	40,722	16.40%
Skilled agriculture	268	0.10%	206	0.10%
Craft and related trade	10,710	3.30%	8,247	3.30%
Plant and machine operator	53,533	16.60%	412,20	16.60%
Elementary and domestic worker	69,852	21.60%	53,786	21.60%
Total	323,179	100%	248,848	100%

Source: Adelzadeh (2017) + own calculations based on same source

**Table 3 Key figures at a glance**

ICT sector workforce	250,000
ICT sector workforce as % of domestic workforce (formal, non-agricultural)	2.20%
% non-white (ICT sector)	65%
% female (ICT sector)	~40%
Latest vacancy figure (ICT sector)	7,200
Vocational graduates per year	n.a.
Tertiary graduates per year (only first degrees)	5,300
% of enterprises that employ ICT specialists	n.a.
% of enterprises providing training for ICT specialists	n.a.
% of ICT sector workforce with tertiary education	17%

Source: Own compilation based on Adelzadeh (2017), MICT SETA (2017) and WEF (2017)

<sup>26</sup> MICT SETA (2016) 'Sector Skills Plan 2017 to 2022'

<sup>27</sup> World Economic Forum (2017) 'The Future of Jobs and Skills in Africa'

of skill shortage in the ICT domain is therefore likely to be considerably larger than the estimates published by MICT and the other SETAs indicate.<sup>28</sup>

A 2017 survey of senior ICT practitioners, conducted by the Joburg Centre for Software Engineering (JCSE) with the objective “to identify the most pressing skills needs from the corporate perspective”<sup>29</sup>, found that 75% of respondents said that the ICT skills shortage was having a major effect on their business, the highest figure since 2009 (the JCSE survey has been conducted annually since 2008). The skills needs mentioned by the largest share of respondents are: big data design / analytics; information security; business intelligence / knowledge management; and system design / architecture.

### Trends in education and training of ICT specialists

Adelzadeh<sup>30</sup> provides estimates of MICT Sector employment by qualification. As noted above, three in four MICT sector workers are in the ICT sector. According to this source (Table 4) more than one in three workers in the sector have not completed secondary education. The share of the MICT workforce with a tertiary degree is a mere 17%. Their number (55,000) is roughly the same as the number

of managers and professionals in the sector (61,000).

These figures stand in sharp contrast to those on the level of education of ICT specialists in Europe. In 2017, more than three fifths (62.3 %) of all ICT specialists in the EU28 had completed a tertiary level of educational attainment. The share of ICT specialists with a tertiary level of educational attainment increased during the most recent decade for which data are available, rising from 54.8 % in 2007; in other words, the share of ICT specialists that had a high level of educational attainment rose by 7.5 percentage points between 2007 and 2017.<sup>31</sup>

While statistics on ICT graduates from universities are readily available, this is not the case for the system of public Technical and Vocational Education and Training (TVET) colleges and private Further Education and Training (FET) colleges. The “TVET data and information system is in a fledgling state”<sup>32</sup> and does not yet produce reliable data at aggregate level. For this reason Table 5, which is based on data from the Higher Education Management Information System (HEMIS), lists only ICT graduates from the higher education system. Total ICT graduate numbers have increased significantly since 2009, from 3,800 to over 5,300 in 2015<sup>33</sup>.

**Table 4 Employment by qualification level in the MICT sector, 2015 and projection to 2025**

Qualification	2015		Forecast 2025 (absolute)		
	absolute	share	Low	Medium	High
No schooling	4,032	1.2%	4,769	5,426	5,741
Incomplete primary	14,545	4.5%	17,244	19,743	20,938
Complete primary	11,445	3.5%	13,569	15,535	16,475
Secondary incomplete	96,686	29.9%	114,456	130,563	138,278
Secondary complete	97,793	30.3%	115,236	129,993	137,097
Certificate & Diploma less than G12	1,584	0.5%	1,861	2,088	2,197
Certificate G12	14,375	4.4%	16,901	18,975	19,974
Diploma G12	27,894	8.6%	32,666	36,356	38,136
Degree	54,825	17.0%	64,144	71,235	74,658
<b>Total</b>	<b>323,178</b>	<b>100%</b>	<b>380,846</b>	<b>429,915</b>	<b>453,495</b>

Source: Adelzadeh (2017) + own calculations based on same source

<sup>28</sup> Compare: Twinomurizi et al. (2017) ‘Towards a shared worldview on e-skills’

<sup>29</sup> Schofield, A. (2017)

<sup>30</sup> Adelzadeh, A. (2017) ‘Modelling Future Demand and Supply of Skills in South Africa’

<sup>31</sup> Eurostat: ICT specialists in employment, July 2018: [https://ec.europa.eu/eurostat/statistics-explained/index.php/ICT\\_specialists\\_in\\_employment#ICT\\_specialists\\_by\\_level\\_of\\_education](https://ec.europa.eu/eurostat/statistics-explained/index.php/ICT_specialists_in_employment#ICT_specialists_by_level_of_education)

<sup>32</sup> Reddy et al. (2016) ‘Skills Supply and Demand in South Africa’, p. 48

<sup>33</sup> Based on data from ‘Centre for Higher Education Trust (CHET)’: South African Higher Education Performance Indicators 2009-2015, Table 9b: Graduates by CESM, major field of study, level and race

**Table 5 ICT university graduates in South Africa**

ICT graduates	2009	2011	2013	2015	% ICT graduates/ all graduates (2015)	Percent non-white graduates (2015)
Undergraduate	3,814	4,137	5,349	5,324	3.8%	86.1%
PG < Masters	538	745	920	943	2.6%	67.5%
Masters	133	220	246	320	2.7%	66.5%
Doctorate	24	42	49	51	2.0%	64.4%

*Source: 'Centre for Higher Education Trust (CHET)': South African Higher Education Performance Indicators 2009-2015, Table 9b: Graduates by CESM, major field of study, level and race'<sup>34</sup>*

As Table 5 also shows, the share of ICT graduates among all graduates is 3.8% (for undergraduates), roughly the same percentage as in more developed countries such as the UK. A major difference to European countries, however, is the small share of graduates who progress beyond the bachelor or equivalent level.

The total number of students enrolled in TVET colleges in South Africa was 740,000 in 2015, up from 360,000 in 2010. Progression and success rates are very low, however, and only a small minority of TVET students are in ICT programmes. The only available data source<sup>35</sup> on completions in ICT programmes at public TVET colleges presents statistics only on National Certificate (Vocational) "information technology and computer studies" programmes. According to these data, only between 100 and 300 students pass examinations per year (pass rates are between 12% and 21%).

### Migration as a factor in ICT skills supply

In 2017, the OECD noted, that the South African government has responded by making it easier for foreign nationals to join the labour market in areas of skill shortage. The Critical Skills Visa allows entry of foreigners who are qualified in areas on the Critical Skills List published by the Department of Higher Education and Training<sup>36</sup>. The Institute of Information Technology Professionals South Africa (IITPSA) which evaluates people for critical skills permits reports about 1,000-2,000 applications per year. These tend to be for highly qualified professionals and do not include inter-company transfers that do not get vetted by IITPSA<sup>37</sup>.

<sup>35</sup> Reddy et al. (2016), p. 94

<sup>36</sup> OECD (2017) 'Getting Skills Right: Good Practice in Adapting to Changing Skill Needs: A Perspective on France, Italy, Spain, South Africa and the United Kingdom', Paris: OECD Publishing.

<sup>37</sup> MICT SETA (2017), p. 35.

## Box 2 ICT skills forecast model for South Africa

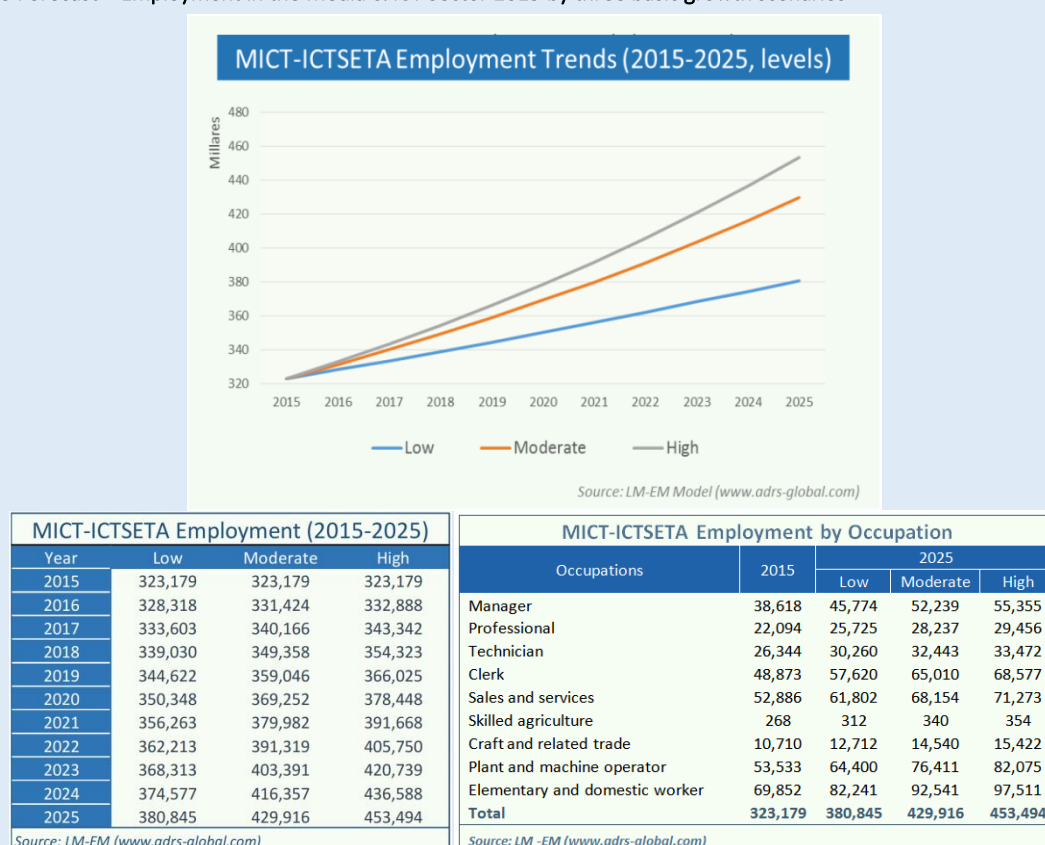
In a 2017 employer survey conducted by the Joburg Centre for Software Engineering (JCSE) 29% of employers stated they are recruiting overseas in 2017, against 26% in 2016, 12% in 2014 and 18% in 2012. Source countries mentioned include other Southern African countries and India.<sup>38</sup> In the absence of a reliable source for the development of labour demand and supply in South Africa's market for ICT specialists, this section will present information from a recent economic modelling exercise which allows a forecast of the employment in the ICT sector until 2025.

In 2017 the results of a skills comprehensive forecasting study by Adelzadeh became available, which uses a similar economic modelling techniques to the one applied by CEDEFOP, the EU's Centre for the Development of Vocational Training, for EU skills forecasting. The model developed for the study calculates estimates of skill demand and supply for three different scenarios:

The "Low Scenario" assumes that economic performance over the next 10 years is relatively weak in terms of growth and employment creation. For the MICT sector the scenario results in a compound annual growth rate of employment over the period 2015-2025 of 1.66%. The "Moderate Scenario" assumes results in 'moderate' rates of economic growth and reductions in the unemployment rate over the next 10 years, reflected in a compound annual growth rate of MICT sector employment 2015-2025 of 2.89%. The "High Scenario" assumes that the South African economy follows a path of high growth and employment, with a compound annual growth rate of MICT sector employment 2015-2025 of 3.45%.

Based on 2015 employment data by sector (estimated on the basis of workplace skills plan (WSP) submissions, see section 2), the author produced the forecasts reproduced in Figure 3 below.

**Figure 3 Forecast – Employment in the Media & ICT Sector 2015 by three basic growth scenarios**



According to the model calculation, the need for employees in the MICT sector will increase from 323,000 in 2015 to 381,000—454,000 in 2025, depending on the economic and political development overall. Under the assumption that the share of ICT within the MICT sectors will remain at today's level of 77%, this means that the ICT sector will employ between 290,000 and 350,000 workers in 2025, up from 250,000 in 2015, a relatively higher increase in comparison to the projections in other countries such as Poland, Ireland and Spain.

Data source: Adelzadeh (2017)

<sup>38</sup> Schofield, A. (2017)



# 2

## Trends in Diversity

South Africa's labour market suffers from very high rates of unemployment, especially among younger people from disadvantaged socio-economic backgrounds. The total number of young people neither in employment nor in education and training (NEET) in the age group 15 to 24 years alone was 3.2 million in 2016, compared with about 1 million students in universities (both public and private) and 400,000 students in colleges. Disaggregation by population groups shows that Black people face considerably more problems in finding employment; the gap between employment rates of the White and non-White working age population is over 21 percentage points. Such disparities are also present within the ICT workforce: only 43% of South Africa's MICT workforce are Black/Africans, against a share of 78% in the economically active population. Another group strongly under-represented in the ICT workforce are women, although the evidence is inconclusive. In university education, Computer and information sciences is the field of study with the lowest share of women after military sciences and engineering: enrolment and completion rates are between 20% and 30% lower for female than for male students. Moreover, 21% of ICT jobs are held by women, i.e. one in 5 ICT employees are female.



## Employment and diversity in South Africa's labour force

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Against a background of a very high level of unemployment, there is a range of age groups in the working-age population in South Africa who find it particularly difficult to participate in the labour market. In the following we will look first at the overall workforce diversity situation, and subsequently at representation of the two groups of people associated with being insufficiently represented in the ICT workforce, namely non-white South Africans and women.

### Labour market participation and employment in general

South Africa's **unemployment** rate is 26.7%, the highest figure among OECD countries (average: 6.3%). Only Greece (23.5%) comes near. Unemployment is more widespread for women (29.2%) than for men (24.8%). Moreover, 59% of all unemployed fall under the definition of **long-term unemployed**, up from 50% in 2009. One in two young people in South Africa are affected by **youth unemployment**.

A closer look at the unemployment data reveals that the country performs significantly better when only persons with high educational attainment (tertiary) are considered. The unemployment rate for this subgroup is only 6.2%, against an OECD average of 4.1%. Three OECD countries, namely Spain, Turkey and Greece, perform worse on this indicator.<sup>39</sup> The overall low level of educational attainment in South Africa is one of the main explanations for the country's performance in terms of generating sufficient employment. In secondary schools, for example, drop-out rates are very high: only 40% of initial students graduate. The total number of young people neither in employment nor in education and training (NEET) in the age group 15 to 24 years was 3.2 million in 2017<sup>40</sup>, compared with about 1 million students in universities (both public and private) and 400,000 students in colleges. The NEET rate of 31.2% is not only much higher than the OECD average

(13.2%<sup>41</sup> for the age group 15 – 29 years-old) but also the highest among countries at comparable levels of economic development. For instance, all other BRICS countries show lower NEETs percentage<sup>42</sup> (15-24 years old): Brazil 24.8%; India 27.5%; Russia 12.4%; China 11.8%.

The employment rate of older workers (aged 55 – 64) has not changed much since 2008, when data became available, experiencing a slight decrease from 41.5% in 2008 to 41.1% in 2018.<sup>43</sup> The age employment rate gap, defined here as the difference in percentage points between the rates for age group 25-54 and age group 55-64, is 16.3% against a slightly higher OECD average of 17.4%.

In 2017<sup>44</sup>, South Africa's gender employment rate gap is at 11.4 percentage points, significantly below other OECD countries (i.e. Japan 15.5 p.p.; Italy 18.2 p.p.; Turkey 38.5 p.p.) and other BRICS countries (i.e. Brazil 19.2 p.p.), which is a great achievement. The country has consistently been found to perform well in terms of gender equality when compared to other countries at the same level of development.

However, there seems to be a tendency for the gender gap increase in South Africa when observing the gender pay gap figures. An ILO (2018)<sup>45</sup> report on global wage, ranks South Africa on the top list among upper-middle income countries, with a gender pay gap (using monthly earnings) of 28.6%, followed by Russia with 27.9% but, significantly higher than other countries in the group like Brazil 20.1% or China 19.0%. Nevertheless, the gender pay gap is significantly reduced when the estimate is based on hourly wages, reflecting the differences in the working time between women and men in South Africa. The gender pay gap using hourly wages in South Africa is at the level of 19.4%, compared to 22.9% in Russia, 17.2% in China and 10.2% in Brazil. As

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<sup>39</sup> OECD (2019) 'Unemployment rates by education level (indicator)'. doi: 10.1787/6183d527-en (Accessed on 09 January 2019)

<sup>40</sup> Department of Higher Education and Training, Republic of South Africa (2017)

<sup>41</sup> OECD (2018) 'OECD Family Database', CO3.5 Young people not in education or employment

<sup>42</sup> ILO(2018) 'BRICS Brief Series', BRICS Summary: Youth Employment

<sup>43</sup> OECD (2019) 'Short-Term Labour Market Statistics' Employment rate, Aged 55-64, All persons

<sup>44</sup> OECD (2019) 'Gender gaps in employment rates', OECD Employment Database

<sup>45</sup> ILO (2018) 'Global Wage Report 2018 /19', What lies behind gender pay gaps.

a measure to overcome these challenges, South Africa announced the introduction of a national minimum wage in 2018.

Women's access to managerial employment is relatively good in South Africa, where 35.5%<sup>46</sup> of senior and middle managers are women, higher than the OECD average of around 32%.

As an indicator for the relative labour market situation of ethnic groups in South Africa, we apply the classification of population groups used by the national statistical institute (Statistics South Africa), which distinguishes between Black Africans, Coloured, Indian/Asian and White persons. The gap between employment rates of South Africa's White and non-White working age population is over 21 p.p., as is the gap between the respective unemployment rates. While the latter has hardly changed at all since 2008, there has been some improvement in terms of employment rates, for which the gap was about 2 p.p. higher in 2008. While unemployment for White South Africans is about the same as for the total OECD population, i.e. around 6%, for the large black population majority the figure is above 30%. This clearly shows that inclusion of black Africans, Coloured and – to a lesser extent – Indian/Asians in the country's labour market poses a serious challenge.

South Africa's disability employment and unemployment gaps (1.4% and 0.4%, respectively) are, compared to other countries, very small: For instance, the average disability employment gap is between 20% and 30% in the EU, depending on definition of disability used.

### Diversity and South Africa's ICT workforce

While little data is available on the composition of South Africa's ICT workforce, some insights can be gained from information about the workforce of the MICT (Media, Information and Communication Technologies) sector. With regard to **ethnic diversity**, according to the latest published data<sup>50</sup> South Africa's MICT workforce is composed of 43% black African, 35% White, 12% Coloured and 10% Indian/Asian persons. Although time series data suggest a trend towards a higher share of black African at the expense of White workers, the former are still significantly underrepresented (the black African population group makes up 80% of South Africa's economically active population<sup>51</sup>).

Less than 1% of employees in the sector have a **disability**, against 3.3% in the entire labour force.

About 6% of employees in the sector are **older than 55 years**, which is roughly equivalent to their share in the entire labour force (7.4%).

**Table 6 Key figures on employment and labour market diversity in South Africa, compared to OECD average**

	ZA	OECD
Unemployment rate 2016	26.7%	6.3%
Youth unemployment 2016	53.3%	13.0%
Young people neither in employment nor in education and training (15-24 years) – NEET 2016 <sup>47</sup>	31.2%	13.9% <sup>48</sup>
Employment rate of older workers (55-64 years) 2016	39.5%	59.2%
Age employment rate gap (15-64 vs. 55-64 years) 2016, in p.p.	1.7	6.4
Gender employment rate gap (15-64 years) 2016, in p.p.	11.4	15.4
Ethnic unemployment rate gap, 2016, in p.p.	21.9	---
Ethnic employment rate gap, 2016, in p.p.	21.1	---
Disability employment gap, 2011, in p.p. <sup>49</sup>	1.4	---
Disability unemployment gap, 2011 in p.p.	0.3	---

*Source: Own calculations based on latest data from OECD unless noted*

<sup>46</sup> ILO-STATISTICS - Micro data processing

<sup>47</sup> Department of Higher Education & Training, South Africa (2017) 'Fact Sheet on NEETs (Persons who are not in employment, education or training'.

<sup>48</sup> 15 to 29 years

<sup>49</sup> Lehohla, P. (2005) 'Prevalence of disability in South Africa', Census 2001 Report, Statistics South Africa.

<sup>50</sup> MICT SETA (2017)

<sup>51</sup> According to the Statistical Release (2018) on Quarterly Labor Force Survey, the population of working age (15-64 years) in 2018 in South Africa is reported to be 37,678, 000.

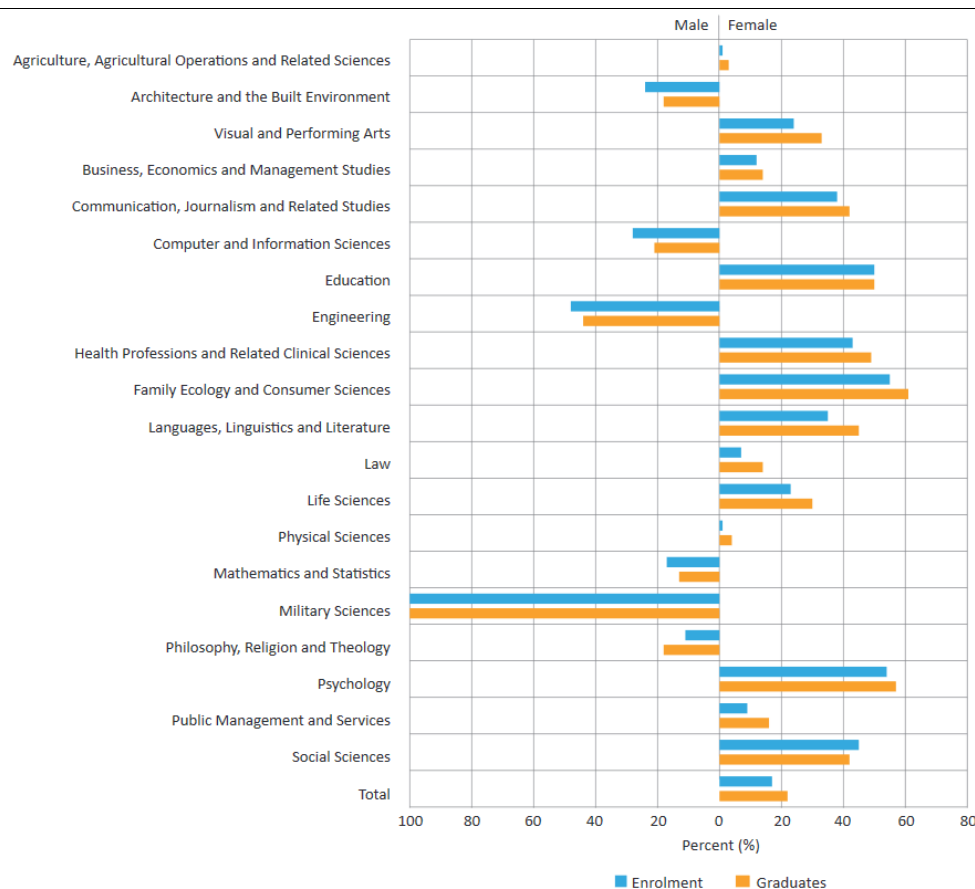
Hardly any data are available about the share of women in the ICT sector workforce or ICT specialist workforce. Some assumptions can be made based on the share of women among the respondents to ICT practitioner surveys: In the case of the 2017 JCSE ICT Skills Survey, their share was 22%. The data presented in the 2016 MICT SETA report suggests that 41%<sup>52</sup> of the ICT sector employees are female, and women make up 47% of the black African group in the sector (but only 32% of the white ICT sector workforce, a significantly higher share of women in ICT sector than any other country. Since the data are based on data from an undisclosed subset of all ICT sector employers, however, there are doubts to what extent they are representative for the entire sector workforce.

In university education, women are significantly overrepresented both in overall university enrolment and graduations, see Figure 4. Computer and information sciences, however, is the field of study with the lowest share of women after military

sciences and engineering: enrolment and completion rates are between 20% and 30% lower for female than for male students.

Some observers notice that the situation has been improving slowly over recent years. The 2017 MICT SETA report states that “Stakeholders in the sector confirmed that there was a rise in the number of women in learnerships, especially in ICT technical areas which were traditionally dominated by men”.

**Figure 4 Gender difference in university enrolment and completions by field of study, 2014**



Source: Reddy et al. (2016), based on data from HEMIS (2014)

<sup>52</sup> See also MICT SETA (2018)



## Policy Overview

Creation of equal opportunities in education has been one of the main policy objections of the South African government since the end of the Apartheid area. The main policy instrument for skills planning are the National Skills Development Strategies (NSDSs), a five-year policy plans to guide the development of sector-specific training frameworks, and the Sector Skills Plans (SSPs) which map out detailed implementation plans and success indicators for skills development, taking account of sector-specific situation and needs. The ICT professions are managed by the Media, Information and Communication Technologies (MICT) Sectoral Education and Training Authority (SETA). The government outlined concrete measures for addressing ICT skills shortages in two National e-Skills Plans of Action (NeSPA), which include a number of priorities regarding ICT specialist training to be accomplished until 2018. Policy-making towards diversity in training and employment is guided by the 1998 Employment Equity Act, which provided a framework not only for elimination of unfair discrimination but also for implementation of affirmative action and measures to enable equitable representation of all types of employees.



## National Level Policies

Following the 1994 elections which brought an end to the apartheid era, the South African government embarked on a universal reform process for skills development. This policy vision was outlined in the **National Qualifications Framework (NQF)** which aimed to create equal opportunities in education and open and transparent career pathways and learning for all.<sup>53</sup> The 1998 **Skills Development Act (SDA)** established a single national regulatory framework consisting of a **National Skills Authority (NSA)** and twenty-five **Sectoral Education and Training Authorities (SETAs)**. The NSA is a stakeholder body which advises the Department of Labour on national skills development policy and strategy and its implementation, the allocation of subsidies from the National Skills Fund and approval of SETA planning. The SETAs were made responsible for developing Sector Skills Plans (SSPs) which map out detailed implementation plans and success indicators for skills development, taking account of sector-specific situation and needs.<sup>54</sup> There are 21 individual SETAs currently, which are also in charge of managing and creating learnerships, internships and skills programmes within their areas of specialisation. The ICT professions are managed by the **Media, Information and Communication Technologies (MICT) SETA**.

An overarching strategic guide for skills development is provided by a set of **National Skills Development Strategies (NSDSs)**. The NSDSs are five-year policy plans devised by the DHET to guide the development of sector-specific training frameworks with clear, numerical success indicators<sup>55</sup>. The current framework falls under the NSDS III (2011-2016), which was recently extended up to the year 2020. Its targets include:<sup>56</sup>

- Establishing a credible institutional mechanism for skills planning;
- Increasing access to occupationally-directed programmes;

- Promoting the growth of a public FET college system that is responsive to sector, local, regional and national skills needs and priorities;
- Encouraging better use of workplace-based skills development;
- Encouraging and supporting cooperatives, small enterprises, worker-initiated, NGO and community training initiatives;
- Increasing public sector capacity for improved service delivery;
- Building career and vocational guidance.

The National Skills Development Implementation Report 2011 – 2016, highlights achievements and successes in meeting the intentions of the strategy, among others, the followings have been achieved:

- Launch of Labour Market Intelligence Partnership (LMIP) project with the aim of creating systems to provide accurate and reliable data to help involved stakeholders make better decisions in matching national skills supply to demand; Establishment of the Sector Skills Planning (SSP) Team within the DHET; development of the SSP Framework to support SETAs in aligning education and training supply side with employers' demand for skills in their sector; Published report from LMIP on Skills Demand and Supply in South Africa.
- Research on articulation of pathways and curriculum alignment in respect of FET college qualifications; Establishment of over 150 active Research Chairs to encourage communication between SETAs and universities;
- Service Level Agreements between SETAs and DHET which include the requirement for work-based integrated learning for public TVETs and universities of technology students; Development of a Level 5 foundational certificate to enable articulation into STEM related study options between TVET colleges and universities.
- Increase of enrolment rates in Learnership over the five-year period, from 27, 679 unemployed learners enrolled in 2011/12 to a total of 67,864 in 2015/16.

In order to address the insufficient capacity and lack of integration of the country's vocational education and training system, the 2013 **White Paper on Post School Education & Training** envisaged increased enrolment in public TVET colleges, from ±800'000 currently to 2.5 million, by 2030. To this end, the document laid out the strategy for "a single, coordinated post-school education and training

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<sup>53</sup> Mummenthey (2010) 'Skills Development in South Africa'

<sup>54</sup> International Labour Organization (2011) 'Formulating a National Policy for Skills Development'

<sup>55</sup> Department of Higher Education and Training (2011) 'National Skills Development Strategy III'

<sup>56</sup> *ibid.*



### Box 3 Snapshot: National e-Skills Plans of Action

The **2006 National Information Society and Development Plan** already acknowledged that: “South Africa faces significant human capital development challenges in building the Inclusive Information Society. One of the key challenges is the shortage of ICT skills in the country. The shortage is often attributed to the mismatch between the supply of skills and the skills demanded in the labour market. The shortage of skills is further aggravated by a loss of skills to other countries that offer higher salaries and better conditions of employment. [...] Another related challenge, which also comes about as a result of the shortage of skills, is that of the mobility of skills within the sector.”

The government outlined concrete measures for addressing ICT skills shortages in two **National e-Skills Plans of Action (NeSPA) in 2010 and 2012**. The plan includes a number of priorities regarding ICT specialist training to be accomplished in years until 2018:

- “50% increased intake in relevant e-skills course and programmes, • 75% of graduates appropriately e-skilled for employment and entrepreneurship; [...]”
- 100% increase of undergraduate, postgraduate and short courses relevant to the country’s e-skills needs and delivered through open and distance learning;
- 100% access to the e-skills for Digital Inclusion and Social Innovation in the rural and periurban communities

Development, coordination and provision of ICT specialist training in the public sector is delegated to the **E-Skills Institute**, the **National Electronic Media Institute of South Africa (NEMISA)** and the **Institute for Satellite and Software Applications**. In February 2014, these institutions were merged to form the **iKamva National e-Skills Institute (iNeSI)**.

**South Africa Connect**, the “National Broadband Policy” launched in 2013, includes actions to boost acquisition of ICT skills in the form of both “supply side skills” (i.e. ICT specialist skills) and “demand side skills” (i.e. ICT user skills). Objectives include “the development of a strong national skills base so that South Africa can perform as a proficient and globally competitive knowledge economy” (p. 13). Priority is placed on addressing high level skills shortage including engineering and technical skills.”

The **National ICT Policy White Paper** from September 2016 represents a further development of the policy framework for South Africa’s “transformation into an inclusive and innovative digital and knowledge society”. Although most of it is concerned with ICT infrastructure and services, the need for policy intervention in the skills development area is mentioned as well. A review of existing policy had identified “the fragmented nature of the skills sector, making it difficult to maximise the value of the existing interventions to develop new e-skills across the ICT sector” (p. 157), a situation which needs to be mitigated. The White Paper highlights the list of action points, the government plans to take to better monitor and address the national e-skills gap; and recommends a stronger multi-stakeholder partnership approach both within and outside of government, in terms of delivery.

*Source: Presidential National Commission on Information Society and Development (2006); The Information Society Institute (2010); e-Skills Institute (2012); Department of Communications, Republic of South Africa (2013); Department of Telecommunications and Postal Services, Republic of South Africa (2016)*

system” that ensures “expanded access, improved quality and increased diversity of provision” and “stronger and more cooperative relationship between education and training institutions and the workplace”.<sup>57</sup> A **National Plan for Post-School Education and Training (NP-PSET)** is currently being under preparation to follow up the White Paper. The plan is to “review and rationalise the entire gamut of occupational programmes and qualifications and

rationalised into a coherent and simple framework that fits easily into the NQF and makes learning pathways clear to school leavers and employers”.<sup>58</sup>

In the tradition of policy-making since the end of apartheid, the South African government stresses inclusion and diversity as a horizontal topic in all of the above policy strategies. The 1998 **Employment Equity Act** provides a framework for the elimination of unfair discrimination in the workplace on the basis of ethnic origin, gender or disability groups, as well as

<sup>57</sup> Department of Higher Education and Training (2013) ‘White Paper on Post School Education & Training’

<sup>58</sup> *ibid.*

implementation of affirmative action and measures to enable equitable representation of all types of employees. While the principle of no unfair discrimination is applied in similar ways than in most other countries, affirmative action is designed specifically to rectify some of the inequalities resulting from the legacies of South Africa's colonial past and the discriminatory practices during apartheid. The concept of employment equity (EE), therefore, distinguishes between unfair discrimination on arbitrary grounds, like barring someone suitably qualified from doing a certain job because of a particular gender, and fair discrimination, when criteria is based on the requirements of a position such as inherent requirements of a job, or affirmative action. In this spirit the Employment Equity Act comprises positive or affirmative measures to attract, develop and retain individuals from previously disadvantaged groups. These groups are designated in the act as "Black population (including African, Coloured (mixed race) and Indians), women and people with disabilities".

In practice the Employment Equity Act has resulted in what is today known as B-BBEE (**Broad-Based Black Economic Empowerment**), under which all medium-sized and large South African companies must report on a Scorecard to what extent they follow codes of conduct defined for 'Black population' (including African, Coloured (mixed race) and Indians) participation in ownership; management control; skills development; enterprise and supplier development; and socio-economic development. The **Preferential Procurement Act** demands that all companies in South Africa that deal with the government or parastatals must comply with B-BBEE as certified by their Scorecard. In return, these companies require their suppliers to be empowered to improve their rating at government. Thus broad-based empowerment is driven down the supply chain.

### Province level policies

Of the nine provinces of South Africa, only Gauteng and Western Cape have policies and programmes targeted specifically towards digital skills training. In 2004, the **Sci-Bono Discovery Centre** started as a partnership between the Gauteng Province Department of Education and various private partners, including SAP Africa. Based in Johannesburg, it is South Africa's largest science centre and is responsible for delivering the country's STEM strategy by offering programmes, exhibits and workshops on science and technology. The Sci-Bono Discovery

Centre<sup>59</sup> aims to improve the teaching and learning of STEM subjects in Gauteng schools; provide career education to learners and youth; provide skills development opportunities for youth; and promote and improve public awareness of and engagement with STEM subjects.

In 2014, the Western Cape Government initiated the **Cape Access**<sup>60</sup> project, which aims to make internet and ICT more accessible to rural and underprivileged communities throughout the region. It has over 36 e-Centres with free access to the Internet and staff that helps people with basic computer literacy. The e-Centres, in partnership with Microsoft and ICDL, also run basic to intermediate computer user certification courses.

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<sup>59</sup> Sci-Bono Discovery Centre (2015) 'Annual Report 2014/15'

<sup>60</sup> [www.westerncape.gov.za/capeaccess/](http://www.westerncape.gov.za/capeaccess/)

#### Box 4 Snapshot: Funding of skills development in South Africa

The mechanism used to fund skills development in South Africa is known as the **levy-grant system**. Employers pay a levy for skills development, and 80% of this pool of funds is passed to the Sectoral Education and Training Authorities (SETAs). They distribute a portion of the levy funds to contributing employers for training provided to their workers. The remainder is used to support implementation of sector skills plans and various types of training that combines formal institutional and workplace-based training. SETAs are expected to direct and facilitate the delivery of sector-specific skills interventions that help achieve the goals of the National Skills Development Strategy and to address employer demand in their sectors.

The National Skills Fund (NSF), established through the Skills Development Act (SDA), was created to allocate a proportion of the skills levy to those who would not normally benefit from employer training. The money was meant to be targeted at disadvantaged groups, including the unemployed and those preparing to enter or re-enter the labour market. Particular attention was to be paid to black population, women, the disabled and others whose training opportunities had previously been limited by law and custom. The NSF has currently allocated 20% of the skills development levies collected from employers, and this is the Fund's main source of income.

The original goals set for these institutions have not been fully achieved and the responsible institutions have been subject to criticism for not doing enough to address the challenge of skills development in South Africa. Significant challenges remain, such as in producing good information about skills needs, or increasing provision and quality of provision of education and training in areas needed by the economy. The levy-grant system, as it is currently being managed, has shown to have limited credibility among many stakeholders, and public perceptions of the skills system tend to not be very positive. Low skill levels have consistently been identified as a serious impediment to economic development, and the skills system has to overcome significant challenges in order to make a decisive impact in terms of addressing the country's skills challenges. A series of reviews and evaluations commissioned by various government departments and other role players have identified some of the main problems.

A big challenge lies in the area of skills planning. Inadequate research capacity, a lack of economics, labour market and industry expertise, poor data management, and lack of planning expertise have resulted in sector skills plans that have limited credibility and impact in their sectors. Many scarce skills occupations are found across economic sectors, not only in sector silos. Skills needs are increasingly being understood in terms of supply and value chains, and narrowly focused sector skills plans do not allow for the flexibility needed in a fast-changing economic environment. Currently, government economic and developmental priorities are not being adequately addressed, including skills requirements for strategic infrastructure projects and for implementing the Industrial Policy Action Plan and key sectors identified in the New Growth Path. Far more, and better-quality, research is needed if skills plans are to be improved and gain credibility and value. Workplaces are good sources of information on current skills shortages, which is a crucial aspect of planning, but many other sources of data are required to enable the needs of the labour market to be fully understood and to ensure a sufficiently forward-looking focus. [...] In the future, SETAs (or their equivalent if they are restructured) will be given a clearer and to some extent narrower and more focused role. The aim will be to locate certain functions (such as skills planning, funding and quality assurance) in well-resourced central institutions, thus enabling sector structures to focus on engaging with stakeholders in the workplace, establishing their needs and agreeing on the best way of addressing them, facilitating access to relevant programmes and ensuring that providers have the capacity to deliver programmes that have a genuine impact. A key role of the skills system structures will be to support efforts to implement workplace learning that complements formal education and training.

*Source: White Paper for Post-school Education and Training (2013), pp. 57-58*

# 4

## Findings

Out of 51 programmes identified in South Africa, 38 were found to be directly relevant to inclusive ICT skills training as defined in the scope of our study. In this section, we analyse the results of our survey of stakeholder approaches towards inclusive ICT skills training programmes. We provide a brief look into the pathways available to gain an entry into the digital labour market in South Africa and suggest a taxonomy to classify the programmes surveyed. We conclude this section with a summary of lessons learnt from our selected programmes.



## Methodology and research

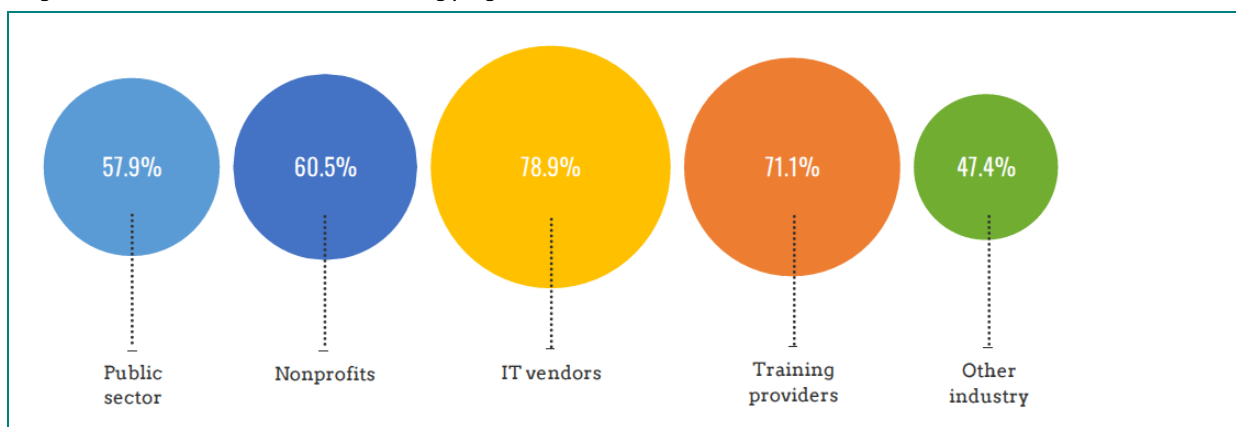
We conducted a comprehensive survey to determine the impact and challenges of inclusive ICT skills training programmes for diverse groups to enter the digital labour market. Our research combined both qualitative and quantitative methods, including surveys, individual interviews with training providers, and in-depth interviews with the selected best cases and employers.

Out of the 51 programmes identified in South Africa, 38 were found to be directly relevant to inclusive ICT skills training as defined in the scope of our study. Figure 5 and 6 show a further breakdown of these programmes in terms of target groups addressed and stakeholders involved in inclusive ICT training in the country.

Individual IT vendors have become particularly active in South Africa, often in partnership with the non-profit sector. Training providers and government sector bodies are other stakeholders showing a high level of activity for inclusive training.

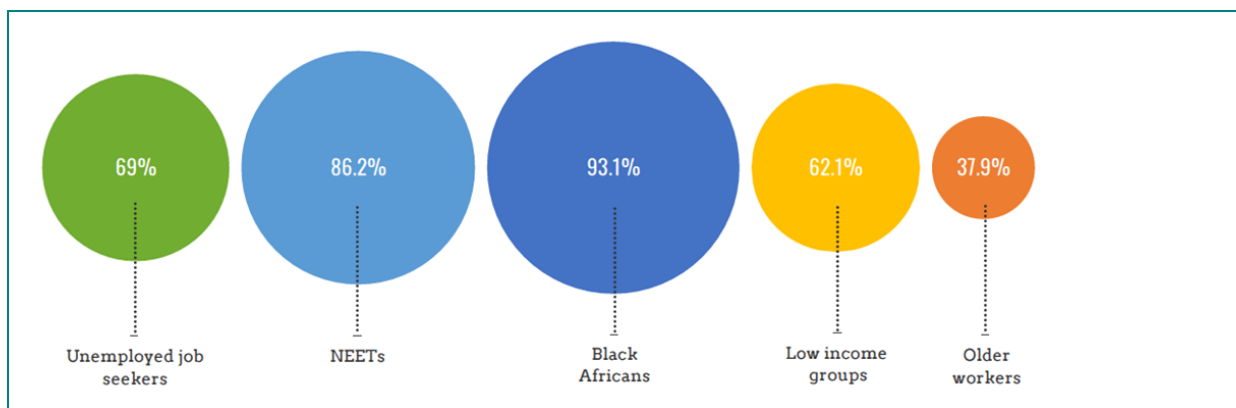
The group of people most often targeted by the training initiatives are Black population, which includes African, Coloured (mixed race) and Indians, in line with the recognised need for affirmative measures in this area. The focus is mainly on young unemployed South Africans and youth neither in education nor in employment or training (NEET), as this is the group generally considered in most need of support for support in order to be able to gain employment in the formal sector of South Africa's economy.

**Figure 5 Inclusive ICT e-Skills and ICT training programmes in South Africa: Main stakeholders**



Source: Own data collection (2017)

**Figure 6 Inclusive ICT e-Skills and ICT training programmes in South Africa: Main target groups**



Source: Own data collection (2017)



## Pathways to ICT skills training and jobs

There are multiple pathways for individuals to gain an entry into the digital labour market; in South Africa, traditional education in the form of university degrees or diplomas is still the most common for higher-level ICT jobs. The other main pathway to a career in ICT is a programme at a Public Technical and Vocational Education and Training (TVET) college or private Further Education and Training (FET) college, often followed by a Learnership which provides essential

practical skills that qualify learners for a job in the real-world business environment. While the existing vendor specific programmes are mainly targeting individuals who are already in employment, all major IT vendors have programmes targeted specifically at young unemployed South Africans, typically in the form of partnerships with the non-profit sector. The four main pathways in South Africa are discussed below.

### Pathways

<p><b>Higher education</b></p> <p>In South Africa, the most common traditional pathway for ICT careers is a degree from a public university or private higher education institute in Computer Science, IT or related subject. These include National Higher Certificates (NQF Level 5) which take one year (full-time) or 18 months (part-time); Diplomas (3 years, NQF Level 6); Undergraduate degree (BSc, 3 years, NQF Level 7); Bachelor of Technology (4 Years, NQF Level 8). The Postgraduate BSc (BScHons, NQF Level 8) and Master (MSc, NQF Level 9) degrees take 1-2 additional years.</p>	<p><b>Internships</b></p> <p>University graduates who face difficulties in finding employment (a common challenge in spite of the shortage in ICT specialists in South Africa<sup>61</sup>) have the possibility to apply for an Internship. These are programmes designed to give graduates an opportunity to extend their academic qualifications through structured workplace exposure and specialised training. Participants are placed on a full-time basis for a period of eight to twelve months in stakeholder companies and government organisations. The purpose is to boost employability by providing learners with workplace experience that builds on their qualification.</p>
<p><b>Vocational education</b></p> <p>Public Technical and Vocational Education and Training (TVET) colleges and private Further Education and Training (FET) colleges offer National Certificate (Vocational) programmes in ICT. Colleges cater mainly for those who have left school – whether they have completed secondary school or not – and who wish to do vocational training or complete their schooling. National Certificate (Vocational) programmes in the ICT domain integrate theory and practice and seek to provide students with a broad range of knowledge and practical skills within the ICT field. Courses last over three years (one year per level). Successful completion of results in a Full Certificate on NQF Level 2, 3 and 4, respectively.</p>	<p><b>Learnerships</b></p> <p>Learnerships are work-based learning programmes directly related to an occupation such as IT technician, and offered under the auspices of MICT SETA. This is a route to a NQF registered full qualification. Learnerships combine a structured learning component with practical work experience that is acquired while being employed in a company, government department or small business. They are available to people who have left school, college or other training institutions after completing some formal education, as well as for people (16-35 years) who have been unemployed for some time. The duration is one to two years.</p>

<sup>61</sup> Oluwajodu et al. (2015) 'Graduate unemployment in South Africa'



## Higher education and the ICT paradox

Typically higher education is one of - if not - the most promising pathway for entering the labour market. However, South Africa's higher education system is frequently blamed for failing to produce ICT graduates who meet the needs of employers, which is reflected in high numbers of unemployed ICT graduates in a (paradox) situation of strong market demand for ICT specialists.

South Africa's higher education system is frequently blamed for not keeping pace with the rate of change of technology, and for failing to produce ICT graduates who meet the needs of employers.<sup>62</sup>

This is reflected in high numbers of unemployed ICT graduates in a situation of strong market demand for ICT specialists – what is referred to as South Africa's 'ICT paradox'<sup>63</sup>. University representatives point out that the country's academic sector is 'already stretched and underfunded' and usually operates within very tight budgets and timelines.

Against this background, experts have argued for "curricula to be more relevant and academics to have more practical experience to ensure that graduates were prepared for the workplace. They also suggested that substantially more mentoring, coaching, and open learning should be available to support graduates in the workplace".<sup>64</sup> Twinomurinzi et al. (2017) suggest that "graduates may therefore need an extra 'ready-for-industry' course as part of their ICT skills curricula".<sup>65</sup>

In the absence of curricula that meet the needs of employers, the internship instrument promoted by MICT SETA is of particular relevance. Internships are a means to fast track high level skills and to offer needed work experience to unemployed ICT graduates. The content of each internship is decided by the employer which means that there is a direct relationship between skills needs and the training being provided. Internship schemes are of particular interest to members of groups currently under-

represented in the ICT workforce, such as women and Black population (which includes African, Coloured (mixed race) and Indians) as they can help overcome traditional misperceptions about their suitability for positions traditionally held by white males, as in the case of ICT specialists.

## The TVET challenge

The quality of education at public TVET colleges in South Africa is considered very low by employers seeking to fill ICT vacancies. This applies, in particular, to colleges established for black students under apartheid<sup>66</sup>. According to research undertaken by MICT SETA "the perception within industry is that public TVET colleges are not producing outputs. [...] Stakeholders in the sector confirmed that they essentially do not recruit interns from TVET colleges"<sup>67</sup>. One of the reasons reported is that such graduates were not in a position to perform at levels required for companies operating on international markets. However, recent figures from the MICT SETA annual report indicate that the number of TVET students placed at the workplace have almost doubled in the recent period, rising from 565 in 2015/2016 to 1,000 in 2016/2017.

MICT SETA has responded by offering employment-directed training mainly through the E-Skills Institute, the National Electronic Media Institute of South Africa (NEMISA) and the Institute for Satellite and Software Applications, which were merged in 2014 into the iKamva National e-Skills Institute (iNeSI). Over the period 2011–2016, about 47,000 learners have enrolled for a NQF qualification registered with the MICT SETA. Their number has increased continuously, from about 3,900 in 2011 to 12,700 in 2016<sup>68</sup>. The figure includes Learnerships as well as the less widespread Skills Programmes, which are implemented to meet the needs of an employer to enhance employees' or candidates' knowledge for a particular skill.

For persons who face difficulties in entering the ICT workforce, Learnerships are of particular value as they expose participants to the business environment and thereby serve as an entrance into the industry. Learnerships have been shown to increase access to

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<sup>62</sup> Calitz et al. (2014) 'South African Industry ICT graduate skills requirements'

<sup>63</sup> Twinomurinzi et al.(2017) 'Towards a shared worldview on e-skills'

<sup>64</sup> Economic Development Department and Department of Higher Education and Training (2014) 'Skills for and through SIPS'

<sup>65</sup> Twinomurinzi et al.(2017), p. 225

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<sup>66</sup> Department of Higher Education and Training (2013)

<sup>67</sup> MICT SETA (2017), p. 42

<sup>68</sup> MICT SETA (2018)

employment opportunities and to assist in career-pathing and self-development.

For the employer, offering Learnerships to black Africans, Coloured (mixed race) and Indians has the advantage of earning Empowerment credentials and B-BBEE points for the company (see Section 3). More generally Learnerships can be used as a vehicle to address employment equity targets and to help fill identified skills gaps.

### Learnerships and internship ('ship) systems

The learnership system in South Africa was first implemented in 2001, as a key component of the National Skills Development Strategy (NSDS), with the aim to provide a nationally recognised qualification which integrates both, theoretical education with work-based skills training. The learnership pathway is a comprehensive system which operates across all skills levels (basic skills: NQF Levels 1–3, intermediate skills: NQF Level 4 and high skills: NQF Levels 5–8) and occupations, offering skills-upgrading opportunities to the employed as well as vocational education and training to the young unemployed.<sup>69</sup>

Much is expected from this system, which is currently gaining momentum against some other skills interventions programmes in South Africa (i.e. apprenticeships, other skills programmes), as a skills development and employment-creation mechanism prioritising the young unemployed. Research has shown that these pathways tend to be accompanied by some doses of scepticism from many young people who do not perceive the system as a preferred post-school certification option. Arguments here relate to the fact that learnerships are yet untested and that they will not open up job opportunities.<sup>70</sup>

Contrary to these perceptions, learnerships have been shown to increase access to employment opportunities and to assist in career-pathing and self-development. They seem to be used successfully as a vehicle to address employment equity targets and to help fill identified skills gaps. Researchers have found a positive link between employment outcomes and the successful completion of a learnership. In an impact assessment study carried out by Kruss et al. (2012), it was found out that 86% of people who completed a learnership experienced a smooth

transition into stable employment, and in most of the cases this happened directly upon its completion.

The MICT sector is also putting efforts in absorbing young unemployed people graduated from respective training programmes. The annual report 2016/2017 released by MICT SETA indicates increased numbers of unemployed learners entering learnership / internship programmes. The report indicates that around 60% of 3,000 learners who entered learnership programmes and 80% of 1,500 learners who entered graduate internship programmes were placed in permanent employment upon completion of the programme. Graduate internship programmes, likewise learnerships, lead to workplace exposure and specialized training opportunities by, at the same time, offering the possibility of a smooth transition of young unemployed into the labour market.

However, despite the positive evidence, the learnerships / internships system caters for a very small proportion of learners per year in comparison to the mass demand of young people for training and certification to access the labour market. Nevertheless, the positive outcomes highlight the potential value in extending the scale and reach of these types of programmes, by offering the possibility to a larger proportion of young people than at current situation.<sup>71</sup> Trainings costs as barrier for take-up

Student fees for university degree programmes are between €1,000 and €4,000 per year. Fees have risen substantially over the past two decades, as overall government funding to institutions has not kept up with the financial requirements of the system. Such fees pose a major barrier to access for many students, especially persons from a disadvantaged socio-economic background. Member of this group will require a bursary to be able to enrol. Computer Science and IT bursaries are available from private industry trusts, but tend to be limited to students showing exceptional promise. In addition, MICT SETA in partnership with the National Student Financial Aid Scheme (NSFAS) provides bursaries to pursue degree studies in the ICT sector at a public university.

For TVET courses, the Department of Higher Education and Training pays 80% of the delivery cost; for the remaining 20%, many full bursaries are available also from MICT-SETA and other stakeholders.

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<sup>69</sup> Wildschut et al. (2017)

<sup>70</sup> Kruss et al. (2014)

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<sup>71</sup> Ibid.

Learnership programmes are 100% funded by the SETAs. Access is limited to applicants who meet minimum criteria for a learnership at a particular employer. Assessment is done by Labour Centres prior to an interview with the employer. Unemployed people participating in Learnerships will receive a learner allowance from the employer. From the viewpoint of the learner, the main challenge here is finding an employer who is willing to offer the learnership.

### Industry-driven training programmes

Vendor courses, i.e. training provided by international vendors and focusing on specific products (hardware or software sold by vendors such as Cisco, CompTIA, HP, Oracle and Microsoft), are not accredited by the

international exams. The government is currently seeking ways how to qualify such programmes as formal qualifications, which would greatly increase their value for both job-seekers and employers.<sup>72</sup>

Already today, however, ICT vendors are registered with MICT SETA for offering programmes dedicated to disadvantaged groups. These are usually initiatives funded from the companies' CSR budget. Examples include T-Systems who in co-operation with the Good Work Foundation, an international NGO, operates the Hazyview Digital Learning Centre (HDCL)<sup>73</sup>, which targets students from disadvantaged backgrounds. Another example is Vodafone Foundation's Youth IT Skills Development initiative.<sup>74</sup> The ICT multinational SAP set up a collaboration with the Sci-Bono Discovery Centre, an NGO, to adapt the 'Simplon'

## Good Practice Showcase: Ikamva Youth Operation Fikelela

### ICT training for opening disadvantaged youths a pathway into tertiary education and employment

IkamvaYouth is an NGO whose mission it is to enable disadvantaged youth to pull themselves and each other out of poverty and into tertiary education and/or employment. IkamvaYouth provides after school support for learners in Grade 8-12; their model uses peer-based support, group tuition, Grade 12 mentoring and facilitated access to computers and end-tech products. Learners enrolled in the programme have access to over 350 hours of tutoring and workshops per year as well as a two-week winter school programme. In terms of tech training, IkamvaYouth ensures that all learners have access to a computer and are computer literate by the time they reach Grade 11 through a programme they use in collaboration with 'Computer for Kids'. At some of its branches, through partner organisations, the organisation has also run coding programmes for learners who want to learn more about ICT. Since its inception, IkamvaYouth has replicated its results in 17 township branches around the country. It is currently supporting over 4,000 learners.

#### Why a good practice showcase?

- **Significant success in activating young persons at risk of social exclusion:** Over a period of six years, IkamvaYouth has enabled 1,120 learners to complete Grade 12; 89% have accessed a post school opportunity and putting them on the path to earning a dignified living; 53% of participants have accessed tertiary education (university or college). Analysis of alumni data has revealed that 36% of Ikamvanites alumni from 2005 – 2015 are currently employed across various positions.
- **Strong activity in sharing best practice with other stakeholders across the country:** IkamvaYouth is also offering support to other non-profit organisations who are also implementing the same model through its 'Community Collaboration Programme' (CCP). The CCP model aims to tackle South Africa's skills crisis by developing a cohesive response using IkamvaYouth's years of experience and supporting other organisations to do the same by sharing best practices.

For full details of the case, see Appendix D.

MICT SETA.. These are typically short, intensive courses that are industry centred and based on

<sup>72</sup> Department of Telecommunications and Postal Services (2016) 'National Integrated ICT Policy White Paper'

<sup>73</sup> diversITy good practice repository:  
<https://eskills4diversity.com/map.html>

<sup>74</sup> diversITy good practice repository:  
<https://eskills4diversity.com/map.html>

programme from the original French version for implementation in Gauteng Province, targeting youth from disadvantaged backgrounds.<sup>75</sup> EOH, a large consulting, technology and outsourcing company, operates the EOH Youth Job Creation Initiative which providing MICT-SETA accredited training to disadvantaged youth over a period of 12 months.<sup>76</sup>

#### Box 5 Snapshot: The Training and Recruiting Landscape in South Africa

- Feedback from South African employers of ICT specialists reveals that learners with well-developed transversal skills are better positioned to be recruited by employers. With greater convergence of technologies, ICT workers will be judged by their ability to move seamlessly between several differing technologies rather than their expertise in a particular niche alone.
- Exposure to the ICT sector itself is seen as crucial to support someone into employment. Such exposure can take the form of a work placement which is part of the training, or a learnership, internship or skills programme where training and work experience are combined throughout.
- Employers indicate that graduates and trainees with no prior work experience tend to lack, in particular, soft skills.
- With regard to soft skills, South African employers report that applicants for *mid-level* jobs suffer most often from gaps in communication, editing and script writing, presentation, business management and administration skills, while applicants to *management-level* vacancies often lack leadership, project management, presentation and financial management skills. Applicants for lower-level jobs are reported to show gaps in business etiquette, work readiness and ability to adapt to the workplace, and customer service skills.
- Mixed or integrated approaches to training are the most desirable for both trainees and employers in South Africa, particularly those in an experiential learning setting.
- Co-operation with businesses, if possible from the local economy, is especially relevant for designing curricula of training programmes for both technical and soft skill-sets because employer-driven programmes respond better to market demands for ICT and work-relevant skills.
- Every organisation (except public sector and public benefit organisations, who are exempt) with a payroll of R500 000 per annum and over must pay a 1% skills development levy (SDL). Many SMEs have simply regarded this as a 'tax' and have not made any effort to find out where the money goes, and how they may be able to recover part of the SDL, which can be used for training and development. As a consequence SMEs are reluctant when it comes to training in general not to mention to provide inclusive ICT training.

Source: diversITy survey (2017), empirica + MICT SETA (2016, 2017, 2018)<sup>77</sup>

<sup>75</sup> diversITy good practice repository:  
<https://eskills4diversity.com/map.html>

<sup>76</sup> diversITy good practice repository:  
<https://eskills4diversity.com/map.html>

<sup>77</sup> MICT SCET (2016) 'Sector Skills Plan 2017 to 2022'; MICT SETA (2017) 'Sector Skills Plan 2018 to 2023'

## Training taxonomy targeting training needs

We classified the ICT skills training programmes identified in South Africa in six categories based on the programmes' approaches to learning. The most promising programmes use multiple methods that are a combination of two or more approaches. The

advantage of using integrated approaches is that it allows for the development of both technical and cognitive skills. These approaches are discussed in more detail below.

### Bootcamps



Intensive training programmes generally lasting from a few days to several months. Training can be full- or part-time depending on the programme and consists of lessons, individual and team projects, 1:1 tutoring and tests.



### Workshops

These typically take one to three days. Training is on specialised topics and consists of presentations and interactive peer-to-peer sessions.

A variety of training providers use both bootcamps and workshops (the terms are used interchangeably in the South African digital training landscape). Coding bootcamps for example have a skill-intensive focus that cover areas such as intermediate to advanced programming languages, supplemented by smaller sessions or workshops on soft skills training. One of the main provider of coding clubs and bootcamps in South Africa are the Change the World Trust<sup>78</sup> and WeThinkCode<sup>79</sup>.

#### Success factors

- **Affordability:** Bootcamps are an affordable alternative to a four-year university degree as they require less time to complete and tend to cost less.
- **Flexibility:** Compared to university programmes, bootcamps are more flexible in terms of curricula and can respond faster to changing market demands.
- **Prior Experience:** Bootcamps are less selective than universities in terms of prior qualifications. Individuals who are interested, even if without ICT background, can enrol in training bootcamps.

#### Challenges

- **Certifications:** Bootcamps tend to not offer standardised certifications but rather follow a variety of teaching and training techniques.
- **Employability:** Bootcamp qualifications are not sufficient and employers tend to require more traditional technology qualifications or longer work experience in the ICT sector.

### Classroom



Traditional, instructor-led training in a classroom setting, in most cases using tailored e-learning platforms. Training usually leads to a certificate and can last for several months.



### Online

Training includes but is not limited to massive open online courses (MOOCs). Courses are available on online platforms, are mostly free to join and may or may not have instructors. Assessments are sometimes self-administered or based on peer-to-peer feedback, while others offer the possibility to take a final exam and earn a certificate.

<sup>78</sup> <http://www.changetheworld.org.za/projects/hands-on-coding-bootcamps>

<sup>79</sup> <http://www.wethinkcode.co.za>



Classroom training, sometimes complemented by online learning elements, is by far the more popular approach towards ICT skills training used by most training programmes in South Africa.

#### Success factors

- **Flexibility:** Learning through online platforms can be more flexible as trainees can access courses and schedule tests based on their own availability. However, this may not be possible with classroom training if programmes follow a strict in-house schedule.
- **Learner engagement:** Classroom training tends to be much more suitable for ensuring engagement of persons who lack self-efficacy, such as often found among NEET youth and the long-term unemployed.
- **Certifications:** Courses include but are not limited to content provided by IT vendors, such as Microsoft, SAP, Cisco and Oracle. Vendor-specific trainings follow a partner-centric approach in which companies create the curriculum which is then delivered by partners. In order to respond for increased demand for vendor certificates, MICT SETA is working on the mapping of these programmes against NQF qualifications. To date, eleven Microsoft Certificates have been matched with unit standards (the highest is equivalent to an NQF level 5) while Cisco's CCNA certificate is pitched to NQF level 5 and CCNP at NQF level 6.<sup>80</sup>
- **Employability:** Such trainings have the advantage of providing certifications that are valued by employers. A disadvantage of vendor programmes is their focus on the vendor's products, which means they tend to be considered by employers as not generic enough to educate on the underlying principles. Stakeholders in the sector report that employers increasingly want employees to cross-certify with multiple vendors.<sup>81</sup>



#### Challenges

- **Affordability:** Classroom training following a vendor-specified curriculum resulting in a certification tends to cost more, both for trainees and training providers. These programmes, unless funded through sponsors and other mechanisms, are unable to reach low income groups like NEET youths.
- **Accessibility:** Training programmes which require the presence of the learner at the location of the training provider tend to be available most of all in the major urban centres of the country, as our assessment of the training landscape shows. Other parts of the country tend to be underserved. Classroom based training is also less suited for persons requiring flexibility about when to learn, such as parents of young children – in particular single mothers.
- **Connectivity:** Online programmes require good online access to the learning platform, which can be a challenge in some parts of the country. In addition, costs for internet provisions can act as barrier.
- **Prior Experience:** These programmes, especially if offered for free, tend to be more selective when choosing prospective participants. Stricter selection criteria have the risk of excluding those who may have the most to gain from such employability skills.
- **Drop out rates:** A common challenges which characterises online training programmes lies in its ability to keep students on track and motivated to complete the course. In this regard, high drop out rates is a major concern of online courses which, at the same time, raises some doubts about the effectiveness of this teaching method.

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<sup>80</sup> MICT SETA (2017), p.47

<sup>81</sup> MICT SETA (2017), p.43

 <p><b>Experiential</b></p> <p>A mix of technical and experiential learning including classroom-oriented learning and company placements. Both digital apprenticeships and, to a lesser degree, traineeships are designed around experiential learning.</p>	 <p><b>Mentorships</b></p> <p>Not a stand-alone training type and is integrated with other types. A trainee can choose or is appointed a mentor who is an experienced instructor or employee. The mentor is responsible for providing 1:1 guidance.</p>
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Experiential programmes such as an Internships, Learnerships or compulsory work placement are a more recent approach towards ICT skills training. Depending on the programme, training can last from a few weeks to more than a year. Such ICT trainings in South Africa are developed and operated in a process of partnership between MICT SETA, training providers and employers. The training curriculum is designed to reflect the demands of employers. Mentorship programmes that seek to increase workforce diversity and Black empowerment often make use of volunteer mentors who have a personal interest in helping young persons succeed in the ICT sector.

#### Success factors

- **Certifications:** Depending on the programme, a trainee may or may not receive a certification. However, the number of hours worked are recognised as formal work experience.
- **Employability:** Internships and workplace learning programmes have high added value for trainees as they learn both technical skills and soft skills, and get in touch with employers who may want to offer them a job after completion.
- **Employer engagement:** As training is structured to reflect the demands of employers, employers can benefit from being involved in the training by getting relevant skills in return. This is a major success factor of experiential training programmes, especially those developed with the help of business-education partnerships.
- **Mentorships:** In many such programmes, technical training is accompanied by mentorships. Mentors are a valuable source of learning for new trainees or employees at the beginning of their careers. Mentorships work well if mentors are selected based on an intrinsic interest in supporting others during their career.

#### Challenges

- **Prior Experience:** Trainees must be enrolled in a training programme to get placed into an internship. Few training programmes guarantee an internship for all participants and places might be limited. Training programmes that offer compulsory work experience tend to be more selective in terms of prospective participants.
- **Affordability:** It is challenging for training providers to find employers who are willing to train and hire interns because of the resource burden on employers. Usually, experiential training is offered by well-reputed training programmes with a vast network of partners.

## Good Practice Showcase: SAP Skills for Africa

### The ICT multinational's skills programme offering free training to disadvantaged young South Africans

SAP Skills for Africa is the ICT multinational's skills development and job creation initiative for Africa. It aims at developing ICT skills as a means to promote education and entrepreneurship. The scholarship programme runs for three months and is targeted at fresh, talented and unemployed graduates who cannot afford commercial SAP education. The minimum requirement to enter into the programme is a Bachelor education in a field of IT, with a CGPA of at least 3.0 (or a minimum grade of C). After applying, candidates are selected by an online evaluation followed by interviews. The selected candidates are signed up training, which gives them access to the SAP Academy, where they receive a basic SAP review, followed by intensive training, including modules like Design Thinking and Business Skills. After taking the certification exams, students are eligible for a 9-12 month paid internship in the SAP ecosystem. Students also have access to the SAP Learning Hub for one year, as well as a SAP mentor for the duration of the training. In 2015 to 2017 about 350 individuals have completed the training in South Africa. In total 500 have been trained successfully. The programme has achieved a 100% pass rate for obtaining the different respective SAP certifications.

For full details of the case, see Appendix D.

## Good Practice Showcase: SAP Skills for Africa

### .Why a good practice showcase?

- **Strong commitment to employment of trainees:** Every student that goes through the training receives an up-front guarantee of a job before commencing in the 8-10 week programme.
- **Strongly demand-driven programme design:** The content of the curriculum is highly tailored to the demand of SAP partners and customers (e.g. Accenture, TATA, EOH). Through its excellent relationship with these companies, SAP receives detailed information on their SAP related skills shortages. This allows the programme to channel applicants into suitable training modules and also to continuously update the curriculum.
- **High placement rate:** all past 350 learners in the programme could be placed in employment
- **Funding from future recruiters of training participants:** SAP Skills for Africa is partly funded by SAP itself through its CSR budget. For long-term sustainability, however, the funds obtained from hiring partners and customers are essential. Additional support is provided by the government through SETA, including sponsorship for training venues, catering and promotional events.

For full details of the case, see Appendix D.

### A novel approach to address youth unemployment using Transcendental Meditation techniques

Maharishi Institute (MI) offers free tertiary education to those who would not otherwise be able to afford it. MI is an international university that utilises the Transcendental Meditation technique as part of their curriculum. This consciousness-based learning approach aims at an "accelerated holistic education" that includes employment at the university during their course of study. MI seeks to place South African youth from challenging backgrounds into lucrative jobs so they can support their families and give back to their communities. Training is carried out via classroom teaching, online learning coupled with periods of work placement and experience. Students get access to external academic programmes by partner institutes: The Institute is a certified Microsoft Academy and Certiport Centre, and as such is able to offer qualifications through the MICT SETA where the vocational qualifications are registered. Students access the higher degree programmes via distance education while gaining work experience. This is known as the "Learn and Earn" model. Students who have already graduated from their foundation courses work part-time at the Institute's Outsourcing call centre on the MI campus, which is a means to allow students to earn as they learn in order to support themselves at the same time as they benefit from the expertise of multiple roles in the call-centre various departments. The call centre also helps pay for the budget of MI. Other funding comes from private sector donors including SAP South Africa.

### Why a good practice showcase?

- **High impact in terms of leading young people a way out of unemployment:** Since its inception and from the around 15,000 young people trained the MI group of companies has placed over 14,050 youth from disadvantaged socio-economic backgrounds into employment. MI's training programme puts special emphasis on retaining students in the foundation phase, in which the risk of drop-out is high due to social and economic stressors that participants experience.
- **Self-sustainability achieved via an innovative business model:** Whilst generous donations from partners and stakeholder organisations were required for the set-up phase, it soon became obvious that a self-funding model is needed for becoming economically self-sufficient. To this end, MI launched its own call-centre and entered the Business Process Outsourcing (BPO) market with much success. The call-centre is staffed by students ("Learn and Earn" model).
- **A model for other African countries to replicate for addressing youth unemployment by providing ICT training:** In terms of sustainability and replicability, MI may be seen as a precedent in the field of higher education to be replicated in other African cities facing high youth unemployment by implementing and making use of the "Learn and Earn" model. In this model the government does not pay any money, and the students earn money and pay their own fees or student loan while going to school.

For full details of the case, see Appendix D.

## Lessons learnt

Professionals, technicians and associate professionals, and managers are the main occupations in the ICT sector in South Africa where employers experience difficulties in recruiting skilled and qualified candidates. Around 95% of 7,200 vacancies reported in the sector affect these occupational groups. The sector demands for people with higher – level skills and typically, employment within managers, professionals, and associate professionals' categories require a degree, diploma, or NQF level 6 qualifications as an entry.<sup>82</sup>

Employers in South Africa are very reluctant to hire candidates who do not have an academic background in ICT or related fields as well as some work experience. This is mainly due to bad experience with fresh graduates who are seen as lacking fundamental skills needed for operating in a business environment. For entry level positions, recruitment of young persons who have completed TVET is generally not considered a suitable option due to substandard level of training provided by many of these colleges.

In this situation, efforts to increase exposure of learners to real-life workplaces in the ICT domain are much needed. The rapid increase of the number of Learnerships and Internships under the auspices of MICT SETA is a welcomed sign of progress in this matter. Moreover, the National Skills Development Strategy (NSDS) III highlights the importance of reducing the over-emphasis on NQF level 1-3 qualifications and moving towards more appropriate (intermediate and higher) skills. Industry stakeholders, both multinationals and companies headquartered in South Africa, are playing a key role in offering Learnerships and Internships to members of groups from disadvantaged socio-economic backgrounds, often in the context of corporate social responsibility (CSR) strategies. These initiatives are essential for providing learners with the opportunity to combine technical with experiential learning. Company placements are opening new opportunities for many individuals belonging to diverse socio-economic groups, for whom an academic career is out of question for reasons of cost and lack of credentials.

Current numbers of Learnerships offered, however, are by far not sufficient. Moreover, there is evidence that the majority of Learnerships currently being undertaken do not qualify for a job in the ICT sector. In 2017, 45% of all such trainings were for “National Certificate: End User Computing” (NQF 3), which offers only foundational and generic skills that are – albeit necessary conditions for working in the ICT area – not enough even for entry-level ICT jobs. Greater alignment of training offers with employer demand is urgently needed. Also, a process in under way which aims towards resolving the challenges of the NQF with regard to learnerships and apprenticeships, with the focus on consolidating effective work-based qualifications offered by SETAs. To a certain extent, some achievements are already reflected on the current learnership qualifications offered by MICT SETA, where the majority of them are NQF level 5 qualifications, with a few others level 6 and 7<sup>83</sup>. Our analysis further shows that the mentorship model is particularly well suited to encourage young women and black Africans, Coloured (mixed race) and Indians to consider ICT careers for two reasons: first, because role models have been found to play a key role in the attitudes of both young women and black population to working in the digital sectors; second, because it tends to be comparatively easy to recruit volunteer mentors among women and black population working in these sectors. This is because, as surveys have repeatedly shown, they have typically perceived a range of gender or race related obstacles themselves during their career, which they are often keen to help remove for future generations working in the ICT domain. Mentorships increase the likelihood of positive outcomes and chances for labour market entry for these target groups.

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<sup>82</sup> MICT SETA (2018)

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<sup>83</sup> See MICT SETA: “Information on Learning Programmes”



## Box 6 Key lessons learnt from ICT training in South Africa

### Outreach



- Programmes target a variety of socio-economic groups (see Figure 6). A high proportion is geared towards NEET youths and young unemployed job seekers, with a focus on groups currently under-represented in the ICT workforce such as black population, women and people with disabilities.
- MICT SETA, the sector's public skills agency, has limited means for effective outreach to vulnerable groups, and multi-stakeholder partnerships in the area are still under-developed, in spite of progress in recent years. Local partnerships such as the Hazyview Digital Learning Centre (HDCL) and the Sci-Bono Discovery Centre are most successful in achieving visibility among target audiences.
- Employers play a key role as providers of work-based learning, which forms a core element of most programmes targeting groups at risk of exclusion from the labour market. SMEs, which make up the large majority of the country's private sector companies, have limited capacity to approach, recruit and work with persons from groups currently underrepresented in the ICT workforce. This remains a huge challenge.



### Training



- Business-education partnerships, considered essential for developing training curricula, are under-developed in South Africa. Training programmes designed with strong input from industry or IT vendors can better reflect the market need for ICT skills.
- Successful trainings combine a variety of training methods. The most important aspect of multi-level training is the development of both technical and cognitive skills, such as the ability to work in teams, effective communication and problem-solving. In addition, many successful programmes equip participants with skills in self-marketing.
- Mentoring using (mostly) volunteer, seasoned ICT specialists as mentors and role models has been tried and tested and proven to be able to effectively address challenges in attracting and supporting underrepresented groups, in particular women. The as yet low number of potential role models in the ICT sector, however, presents a challenge to use of mentoring for this particular pathway into the ICT careers.



### Employability



- Graduates from non-academic training pathways encounter difficulties in entering the labour market due to a lack of trust in the quality, for example, of TVET certifications.
- Programmes that are designed with strong input from employers often lead to direct employment of participants after completion of the training. The main challenge in this case is ensuring that the selection process for admitting candidates to the training does not work to keep out members of groups currently underrepresented in the ICT workforce.
- Vendor certifications have a high added value for job seekers if combined with a certificate accredited by MICT SETA. Employers prefer hiring those candidates who have successfully completed high quality training from reputable training institutions. If programmes do not equip successful participants with well established, third-party certifications, they risk being of limited impact in terms of improving employability.

## Conclusion

Neither the size nor the nature of existing programmes targeting young persons from groups currently under-represented in the ICT workforce is sufficient to tackle the digital skills shortage and to significantly improve the inclusiveness of the ICT workforce. Stronger, concerted efforts from all stakeholders are required. A range of initiatives by NGOs and private companies are trying to fill the gap left by South Africa's ineffective national ICT training system, especially in the vocational education and training sphere. This section draws a number of conclusions from the experience of existing programmes, and discusses several recommendations as to how progress can be made in the field of ICT trainings for groups currently under-represented in the ICT workforce.



A range of initiatives by NGOs and private companies are trying to fill the gap left by South Africa's ineffective national ICT training system, especially in the vocational education and training sphere. The country's ICT skills agency, MICT SETA, has increasingly sought partnerships with these stakeholders. This has led to significant progress e.g. in the number and quality of Internships and Learnerships being offered. Revision of current learnerships via stakeholder processes and development of new ones is one of the priority actions of MICT SETA for pushing skills development in the sector.

However, neither the size nor the nature of existing programmes targeting young persons from groups currently under-represented in the ICT workforce is sufficient. So far they do not make a significant difference to either the size of the digital skills shortage or the level of inclusiveness of the ICT workforce. Stronger, concerted efforts from all stakeholders are required.

For making further progress it is essential to learn from past experience, both of mainstream ICT training and education programmes and niche initiatives targeting hard-to-reach parts of the South African population. From our analysis of the inclusive ICT training landscape in the country, a number of recommendations can be derived.

## Recommendations

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### Stronger industry input in development of learning interventions

One of the most striking findings is that only 27 of the 40 NQF qualifications developed by MICT SETA or its predecessor organisations "have learners registered against them" – in other words, 13 of these qualifications do not meet any demand whatsoever on the part of employers and training providers. This is a clear indication that the development of appropriate qualifications needs to be much better aligned with labour market needs.

Current programmes such as Learnerships need to be reviewed and new ones developed in a process of close collaboration between MICT SETA (and other skills bodies where relevant), training providers and employers to ensure that participants will be work ready and able to take up positions in the sector. The review need to take account of IT vendor

programmes, most of which have so far not been accredited by MICT SETA.

### Stronger multi-stakeholder partnership at local level

Building partnerships in which state agencies such as MICT SETA work closely with employers and other stakeholders is a tried-and-tested way to increase the responsiveness of colleges to local labour markets. The payoff: improved placement of college graduates in jobs and faster recruitment of suitable candidates for open vacancies.

The local level might also be most appropriate for developing cross-sectoral partnerships and projects in the delivery of learning interventions. This refers to the need for inter-SETA co-operation, i.e. in the form of projects that fund interventions relating to ICT skills located in other sectors as well as skills interventions developed in other SETAs (e.g. management, finance, and other skills) that can be delivered in the MICT sector.

### Urgent need for better data and evaluation

There is an urgent need for better data to give stakeholders vital insight into the size and nature of digital skills shortages, employer investment in training, and the outputs of the country's education and training system.

Data collection by MICT SETA depends on co-operation of employers, who are expected to submit workplace skills plans and annual training reports on the basis of which MICT SETA hands out mandatory grants. However, serious challenges lie with this system. Moreover, the available data on private post-school institutions providing ICT training is very patchy. As a result, industry stakeholders seem to have little trust in the skills forecasts published by MICT SETA and the other SETAs.<sup>84</sup>

There have been plans to mitigate the problem for some time, with little progress in evidence so far. Stakeholders have voiced the need for "a central coordinating body to steer the collaboration efforts between academia, government and industry. That body would need to make recommendations based on data that is acceptable to all. Such data would

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<sup>84</sup> For instance, see: Perry, S. (2014);

need to be transparent and open to all entities to evaluate and independently review”.<sup>85</sup>

Another shortcoming of current practice is the lack of serious evaluation of state-funded learning interventions, such as MICT SETA’s learning programmes. Little is known about the impact in terms of employment and career building apart from evidence that participants found the experience valuable. Research is required on reasons why learners are dropping out, gaining employment or starting own businesses, and why some employers invest in ICT training while others stay inactive.

### **Boosting quantity and quality of ICT training at TVET colleges**

South Africa’s TVET system consists of 50 multi-campus colleges, with about 260 campuses across the country. In addition there are about 290 private colleges, usually much smaller in size. Despite significant growth in recent decades, colleges still enrol fewer students than universities.

In response, the government has embarked on a process of rapidly expanding the college sub-system, while putting attention to improving the quality of its programmes and the capabilities of its staff. Expansion in terms of enrolment numbers is fast. Much of this was made possible by the abolition of tuition fees and the provision of transport or accommodation allowances to students from low-income families. Bursary allocation to TVET colleges has been increased from R 300 million in 2010 to R 5.164 billion in 2018<sup>86</sup>. Further increases are expected.

The main emphasis now needs to be on quality of provision. Given the strong market demand for non-white ICT specialists in the country, investments should prioritise colleges that offer National Certificate (Vocational) programmes in ICT.

MICT SETA should approach multinational companies that operate CSR programmes in South Africa in order to convince them to contribute to the necessary investments in the TVET system, in exchange for better access to graduates who meet their needs as recruiters.

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<sup>85</sup> Twinomurinzi et al. (2017) ‘Towards a shared worldview on e-skills’, p. 229:

<sup>86</sup> Sobuwa (2018) ‘Big boost in funding and quality of TVET colleges’

### **Expand opportunities for work-integrated learning**

Colleges and universities need stronger working relationships with employers. Private sector employers, rather than simply demanding from education providers that they produce graduates whose skills are better aligned with employer needs, should take the initiative themselves. They can do so by co-operating with MICT SETA for offering Learnerships, Internships, mentorships and other means which let students engage in work-integrated learning.

Some up-and-running initiatives are open for any committed company to join, which enables them to benefit from the experience and lessons learnt during years of offering ICT training to disadvantaged groups. An example is the Youth Job Creation Initiative, an initiative set up by EOH, a major consulting, technology and outsourcing company. The initiative is providing training to disadvantaged youth—typically first-time work seekers—over a period of 12 months. Training programmes are accredited by and registered with MICT-SETA. By November 2017, the initiative had successfully recruited, trained and placed in work environments 35,000 youths, both internally at EOH and at partner companies including Investec, Microsoft, Oracle, Transnet Engineering, Anglo American, Oceana, Pick n Pay, and Dischem.

### **Improve the capacity of SMEs to provide inclusive ICT training**

As in the vast majority of countries in the world also most South African SMEs find it difficult to divert resources to offering Internships, Learnerships or other kinds of work-integrated learning, especially when it comes to training persons from groups currently underrepresented in the ICT workforce.

It is against this background that MICT SETA’s 2018 strategy is giving priority to providing support to SMEs within this direction. Also, MICT SETA intends to explore “the potential for established larger companies in the sector to mentor and provide incubator opportunities to smaller less well established businesses”<sup>87</sup>. This is highly welcome, but will require a concerted effort.

Equalities help lines should be established to support SMEs and training providers in their equality policy. In larger companies, networks of current employees

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<sup>87</sup> MICT SETA (2018)

from underrepresented groups plus HRM experts and third-party providers of support measures can go a long way towards establishing “wrap around” support to trainees, line managers and others whose day-to-day commitment is needed.

### Including transversal skills

Central to all successful programmes is a focus not only on core ICT skills, but also inclusion of transversal skills training. This equips graduates with more than just the technical knowledge and practical skills but also with workplace readiness and interpersonal skills and personal development needed for success in the labour market.

Mentoring programmes can be of particular value for the acquisition of transversal skills. Many mentorship programmes make use of seasoned employees who volunteer for the role based on an intrinsic interest in advancing progress in the diversity area. However, the small number of people from many under-represented groups in the workplace means that findings mentors in-house can pose a challenge. For this purpose, innovative models may need to be developed, such as shared mentorship schemes and online mentoring. Multinationals, in the context of their CSR programmes, may want to establish train-the-mentor schemes in which seasoned employees from developed countries give active support to mentors in South Africa.

### Leverage innovative ways to increase investment in ICT training

In their influential 2013 report “Digital Jobs in Africa: Catalysing Inclusive Opportunities for Youth”, Dalberg recommended the use of innovative finance such as pay for performance mechanisms. This is “a funding mechanism that seeks to ensure flexible pooled funding for training providers, an increased incentive for training providers to meet targets, and private sector involvement in funding. It can mitigate the employer risk of employing disadvantaged youth and address the financing constraints of many training organisations. Training organisations receive a stable and continued funding stream, while employers pay for improved labour supply”.<sup>88</sup>

We have not found any evidence that pay for performance is being piloted by South African

providers of inclusive ICT training yet. This is unfortunate given the strong need for investment in the sector and the dismal prospects for the public sector to significantly increase funding in the near future.

### Novel funding models

Our analysis of up-and-running inclusive ICT training programmes revealed that most if not all are facing the challenge of making funding arrangements more permanent. Private sector donors tend to renew decisions about funding individual programmes every few years, based on performance but also on factors unrelated to the level of the initiative’s success.

The “Earn & Learn” model used by the Maharishi Institute (see Good Practice Showcase in the Appendix), shows how alternative funding models could look like. To become economically self-sufficient, Maharishi Institute launched its own call-centre and entered the Business Process Outsourcing (BPO) market in South Africa. Most of the staff are participants in the Institute’s ICT degree programme, which allows the call centre to charge very competitive prices for its BPO services. Students work part-time at the call centre located on campus, parallel to their studies. This has the added advantage that participants benefit from experience of multiple roles in the call-centre’s departments, i.e. Marketing, Human Resources, Accounting and others.

### Exploring new incentives for employers to engage in inclusive ICT training

Some providers of inclusive ICT training, such as IkamvaYouth (see Good Practice Showcase in the Appendix), experiment with new incentives for promoting their offer to employers. One such way is to establish inclusive ICT training via an external provider as a way to earn credits on their Broad Based Black Empowerment Scorecard (see Section 3). In the current situation, many private sector companies find it difficult to invest enough in-house in training measures targeting Black Africans, Coloured (mixed race) and Indians. They would benefit from the possibility to invest in IkamvaYouth as a means to get a higher score on their Scorecard – for many companies an essential precondition for operating in the South African market.

While the details of this model are still being worked out, it points towards a great opportunity for making inclusive ICT training programmes sustainable over

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<sup>88</sup> Dalberg (2013) ‘Digital Jobs in Africa: Catalysing Inclusive Opportunities for Youth’, p. 17



the longer term, without excessive reliance on donors from the CSR sector

### **Career advice, online promotion and more effective matching**

The South African government has published its intention to “review and rationalise the entire gamut of vocational programmes and qualifications into a coherent and simple framework that fits easily into the NQF and makes learning pathways clear to school-leavers and employers”<sup>89</sup>. Currently, however, the system is still very complex and difficult to understand. The effect is that prospective students, parents and employers are often confused as to the merits and demerits of the various programmes.

In this situation, effective career advice is essential in order to motivate as many young persons as possible to consider a career in ICT. First steps are being taken in this direction. The 2013 White Paper calls for the establishment of offices representing the SETAs in each college. These offices could also build relationships with local schools in order to streamline promotional activities and attract young persons as early as possible to the ICT field.

More effective platforms for matching young persons with education, training and employment opportunities are also required, following best practice from around the world but tailored to the specific needs and conditions prevalent in South Africa.

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<sup>89</sup> Department of Higher Education and Training (2013), p. 1

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# Appendices



## Appendix A: Workforce diversity indicators

Indicator	Definition/Source
Long-term unemployment rate	Share of persons unemployed for 12 months or more in the total number of active persons in the labour market. Source: Eurostat [une_ltu_a], data from 2016.
Young people not in employment, education or training (15-24 years) – NEET	Percentage of the population in age group 15-24 years who is not employed and not involved in further education or training. Source: Eurostat [edat_lfse_20], data from 2016.
Youth unemployment	Number of persons under 25 years who are unemployed, as share of the total number of young people in the labour market. Source: Eurostat [une_rt_a], data from 2016.
Employment rate of older workers (55-64 years)	Number of persons in age group 55-64 years who worked at least one hour for pay or profit during the reference week or were temporarily absent from such work, as share of the labour force in that age group. Source: Eurostat [lfsi_emp_a], data from 2016.
Age employment rate gap (15-64 vs. 55-64 years) in p.p.	Difference in percentage points between the employment rates of persons in age group 15-64 to age group 55-64 years. A positive figure denotes that the employment rate for older persons is lower than for the entire workforce. Source: Own calculation from Eurostat [lfsi_emp_a], data from 2016.
Gender employment rate gap (15-64 years) in p.p.	Difference in percentage points between the employment rate (15 to 64 years) for women and the rate for men. A positive figure denotes that the employment rate for women is lower than for men. Source: Own calculation from Eurostat [lfsa_ergaed], data from 2016.
Non-natives born outside the EU, as share of total population	Total population born outside of the EU (borders as of 2016) on January 1. Source: Eurostat [migr_pop3ctb], data from 2016.
Non-native employment rate gap, in p.p.	Difference in percentage points between the employment rate (15 to 64 years) for population born outside of the EU (borders as of 2016) and the rate for the population born in the reporting country. A positive figure denotes that the employment rate for persons born outside of the EU is lower than for those born in the reporting country. Source: Own calculation from Eurostat [lfsa_ergaed], data from 2016.
Disability employment gap, 2011, in p.p.	Difference in percentage points between the employment rate (15 to 64 years) of persons reporting difficulties in performing basic activities, and the rate for persons reporting no such difficulties. Difficulties can relate to seeing, hearing, walking, and communicating, and must have lasted or be expected to last for six months or more. A positive gap figure denotes that the employment rate for persons facing difficulties in basic activities is lower than for those without. Source: Own calculation from Eurostat [hlth_dlm010], data from 2011 (latest available).
Disability unemployment gap, 2011, in p.p.	Difference in percentage points between the unemployment rate of persons reporting difficulties in performing basic activities, and the rate for persons reporting no such difficulties. Difficulties can relate to seeing, hearing, walking, and communicating, and must have lasted or be expected to last for six months or more. A positive gap figure denotes that the unemployment rate for persons facing difficulties in basic activities is higher than for those without. Source: Own calculation from Eurostat [hlth_dlm030], data from 2011 (latest available).

## Appendix B: Definition of ICT occupations according to ISCO

### *ICT Specialists by skill level according to ISCO (International standard classification of occupations)*

Level	ISCO (International standard classification of occupations)
High	Management, architecture & analysis
Mid	Core ICT practitioners – professional level
Mid	Other ICT practitioners – professional level
Lower	Core ICT practitioners – associate / technician level
Lower	Other ICT practitioners – associate / technician level

### **Eurostat: ICT specialists according to ISCO**

<b>Management, architecture &amp; analysis</b>
133 ICT Service managers
2511 Systems analysts
<b>Core ICT practitioners – professional level</b>
2512 Software developers
2513 Web and multimedia developers
2514 Application programmers
2519 Software and multimedia developers and analysts not elsewhere classified
2521 Database designers and administrators
2522 Systems administrators
2523 Computer network professionals
2529 Database and network professionals n.e.c.
<b>Other ICT practitioners – professional level</b>
2152 Electronic engineers
2153 Telecommunication engineers
2166 Graphic and multimedia designers
2356 Information technology trainers
2434 ICT sales professionals
<b>Core ICT practitioners – associate / technician level</b>
3511 ICT operations technicians
3512 ICT user support technicians
3513 Computer network and systems technicians
3514 Web technicians
<b>Other ICT practitioners – associate / technician level</b>
3114 Electronics engineering technicians
3521 Broadcasting and audio-visual technicians
3522 Telecommunications engineering technicians
7421 Electronics mechanics and servicers

## Appendix C: Survey methodology

### Research framework and survey design

The analysis and findings of this report are a result of extensive desk research and two surveys carried out with ICT skills training providers and employers across the target countries. The approach to select and benchmark good practice showcases of ICT training programmes was based on a four-step process

illustrated below. The research findings were further analysed and strengthened expert workshops. Three expert workshops were held in Spain (Madrid), Germany (Berlin) and United Kingdom (London) and attended by a panel of experts from academia, policy, the non-profit sector and businesses.

Step 1: Collection of 300 initiatives	Step 2: Selection of 96 initiatives for the online repository
<p>The first phase of the project, using comprehensive desk research we identified more than 300 initiatives based on the following criteria:</p> <ol style="list-style-type: none"> <li><b>Type of programme:</b> Any type of ICT training programme activity, project, initiative and multi-stakeholder partnership of different levels of government, PPPs (public private partnerships), MSPs (multi-stakeholder partnerships), nonprofit organisations, IT vendors, addressed to:</li> <li><b>Target group:</b> diverse target groups, including women, vulnerable youth with low educational achievement or from difficult socio-economic backgrounds, migrants, unemployed adults changing careers, etc.,</li> <li><b>Scope:</b> to enable them to obtain and develop in-demand ICT skills and support their entry into the labour market.</li> </ol> <p>The process started with the:</p> <ol style="list-style-type: none"> <li><b>Analysis of around 300 e-skills programmes and initiatives</b> identified in desk research throughout selected countries, followed by:</li> <li><b>Identification of further programmes</b> not covered by the initial list by national correspondents from the empirica Global Network for Innovation Research (ENIR) (<a href="http://www.enir.org">www.enir.org</a>) and other national experts where appropriate.</li> </ol>	<p>In the second phase, 96 inclusive programmes were shortlisted from the 300+ collected cases. Each case was given a score on a scale from 0 (low) to 2 (high) based on the following evaluation scheme:</p> <ol style="list-style-type: none"> <li><b>Outcome:</b> To what extent is the programme effective in enabling diverse populations access employment opportunities through the acquisition of demand-driven e-skills?</li> <li><b>Target Fit:</b> To what extent does the programme or initiative target diverse populations to support to enter the labour market?</li> <li><b>Scalability and Continuity:</b> What is the potential for the initiative or programme to replicate, expand or continue to reach more beneficiaries and contribute to the skills development at regional and national level?</li> <li><b>Maturity:</b> Has the programme been in operation for long enough to make it possible to assess performance and to learn from its experience?</li> <li><b>Policy Fit:</b> To what extent is the programme or initiative embedded in a broader policy context?</li> </ol> <p>Textual descriptions of the relevant inclusive ICT skills training programmes were developed based on a common format to get an overview of training measures and how these were addressed and implemented. The selected training programmes are part of an online repository of an estimated 96 programmes, which were selected for further analysis.</p>

Step 3: Identification of Good Practice Showcases	Step 4: Evaluation of Good Practice Showcases
<p>The selection of good practice showcases from the shortlisted programmes was based on the following framework, with each case given a score from 1 (low) to 3 (high):</p> <ol style="list-style-type: none"> <li>1 <b>Relevance:</b> To what extent is the programme relevant in terms of creating a diverse skilled workforce responding to demands in the labour market?</li> <li>2 <b>Transparency:</b> To what extent is it possible to have access to information about the programme?</li> <li>3 <b>Effectiveness:</b> How effective is the programme in providing participants with the ICT knowledge and skills, in line with current demands in the labour market?</li> <li>4 <b>Efficiency:</b> How efficiently has the programme been implemented?</li> <li>5 <b>Impact:</b> What were the effects of the programme on the target groups involved?</li> <li>6 <b>Sustainability:</b> To what extent are the achieved benefits from the programme sustainable?</li> </ol>	<p>The main objective of the final phase of analysis was to further evaluate and benchmark the 22 good practice showcases against a set of defined criteria (evaluation criteria), to identify best practice elements and lessons learnt. The evaluation and assessment of best practice ICT skills training programmes was carried out making use of a qualitative survey of key stakeholders. This consisted of in-depth interviews (with decision makers from the selected best practice programmes and selected employers) and a SWOT analysis to help address and understand issues relevant and factors influencing the success of training measures from different perspectives.</p>

## Employer survey

**Format:** in-depth telephone interviews of around 60+ minutes duration each plus completion of a questionnaire by the interviewee either prior or after the telephone interview.

**Target group:** 12 HR key decision makers in mainly large organisations from Spain, the United Kingdom, Germany, France, Belgium, the Netherlands, Poland and South Africa. **Objectives:** to gather **insights about experiences and expectations related to (inclusive) training programs**. The primary objective was to find out whether the current ICT training(s) are attractive and making use of these would equip participants with the in-demand ICT skill sets and **would qualify them for further consideration by employers**. The interview results served as an input for the policy recommendations developed in the course of the project to inform policy development on the European and national level, and provide practical recommendations to non-profit organisations and training providers.

### **Structure of interviews:**

1. **General – Job profiles:** type of ICT people / professions needed in the organization; roles / competences relevant and required in the organization.
2. **(Digital) skills and competences needed:** relevant digital skills and competences required from an employee in the organisation either already working for the organisation or those applying for a job.
3. **Recruitment criteria:** recruitment process, the different steps involved and main decision makers as well as main sources of recruitment and main prerequisites; minimum entry standards / credentials (e.g. degrees and certifications) required for a potential candidate to be eligible.
4. **Employer involvement and collaborations:** organisation already involved in training schemes addressed to diverse / vulnerable groups of people including vulnerable youth with low educational achievement or from difficult socio-economic backgrounds, migrants or unemployed adults changing careers; providing any offers to such training schemes (internships, apprenticeships, mentoring, training for specific subjects, other) or involved in any collaborations with the training providers (skills needs assessment / matching, curriculum reform, research & development, equipment and facilities, advisory panels, on the job placement, certification standards, other).
5. **Proposed policy interventions and programs**
6. **Recommendations:** to training providers for assuring delivery of the skills and talent needed in the labour market and the organisation through their education / training programs as well as recommendations to policy makers.

**Timing:** October – November 2017



## Appendix D: Good practice showcases

### Appendix D.1 Ikamva Youth Operation Fikelela

EMPOWERING DISADVANTAGED YOUTH TO PULL THEMSELVES AND EACH OTHER OUT OF POVERTY AND INTO TERTIARY EDUCATION AND EMPLOYMENT

#### Target group

- Grade 8 – 12 learners from disadvantaged backgrounds

#### Main activities

IkamvaYouth is an NGO whose mission it is to enable disadvantaged youth to pull themselves and each other out of poverty and into tertiary education and/or employment. IkamvaYouth provides after school support for learners in Grade 8-12; their model uses peer-based support, group tuition, Grade 12 mentoring and facilitated access to computers and end-tech products. Learners enrolled in the programme have access to over 350 hours of tutoring and workshops per year as well as a two-week winter school programme. In terms of tech training, IkamvaYouth ensures that all learners have access to a computer and are computer literate by the time they reach Grade 11 through a programme they use in collaboration with 'Computer for Kids'. At some of its branches, through partner organisations, the organisation has also run coding programmes for learners who want to learn more about ICT.

IkamvaYouth's success is measured by the success of its learners and in the last six years:






- 1,120 learners have completed Grade 12;
- 84.3% have passed matric;
- 53% of learners have accessed tertiary (university or college);
- 41% obtained a Bachelor pass enabling access to university;
- 89% accessed a post school opportunity, putting them on the path to earning a dignified living.

IkamvaYouth's main aim is to enable as many learners as possible to access tertiary education including ICT related subjects and through that easier access to employment. Therefore, relatively few of programme participants have found employment directly after completing their training. Analysis of alumni data has revealed, however, that 36% of Ikamvanites alumni

from 2005 – 2015 are currently employed in various positions.

#### Industry input

Funding comes from a range of private sector donors including Coca Cola Beverages SA and EMpower, as well as the Omidyar Network, an international philanthropic organisation. IkamvaYouth has multi-year agreements with all of these. The organisation also receives grants annually from various foundations and trusts, including EMpower which has supported the organisation for several years.

Impact		
		
1,500 learners completed Grade 12	36% of the alumni from 2005 – 2015 currently employed	53% of learners accessed tertiary (university or college)
		
5,000 learners currently enrolled	41% obtained a Bachelor pass enabling access to university	

#### Lessons learnt

Since its inception, IkamvaYouth has replicated its results in 17 township branches around the country. It is also offering support to other non-profit organisations who are also implementing the IkamvaYouth model through its 'Community Collaboration Programme' (CCP). IkamvaYouth is currently supporting over 4,000 learners through its own branches and through this initiative. The CCP model aims to tackle South Africa's skills crisis by developing a cohesive response using its years of experience and supporting other organisations to do the same by sharing best practices.

## Appendix D.2 SAP Skills for Africa

SAP AFRICA'S SKILLS DEVELOPMENT AND JOB CREATION INITIATIVE AIMED AT DEVELOPING ICT SKILLS IN AFRICA

### Target group

- Unemployed youth with university degrees
- Women

### Main activities

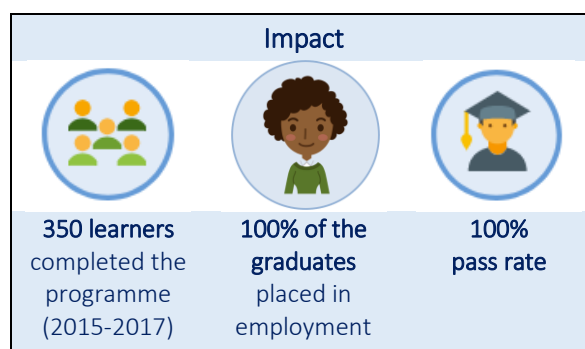
SAP Skills for Africa is SAP Africa's skills development and job creation initiative aimed at developing ICT skills in Africa as part of SAP's global commitment to promoting education and entrepreneurship. It is a three-month long flagship programme aimed at fresh, talented and unemployed graduates. As a scholarship programme, it is targeted at students who cannot afford commercial SAP education. The minimum requirement to enter into the programme is a Bachelor education in a field of IT, with a CGPA of at least 3.0 (or a minimum grade of C). After applying, candidates are selected by an online evaluation followed by interviews. The selected candidates are signed up training, which gives them access to the SAP Academy, where they receive a basic SAP review, followed by intensive training, including modules like Design Thinking and Business Skills. After taking the certification exams, students are eligible for a 9-12 month paid internship in the SAP ecosystem. Students also have access to the SAP Learning Hub for one year, as well as a SAP mentor for the duration of the training.

To date, over 2130 individuals have completed the training in the target countries including South Africa, Kenya, Morocco, Ivory Coast and Algeria with more editions to come in 2017. The programme has been running for under 3 years and has achieved a 100% pass rate for obtaining the different respective SAP certifications.

In South Africa in 2015, 75 students were certified; in 2016, the number rose to 175 and in 2017, certification is planned for 100 students.

Almost 100% of students of the programmes' graduates have been placed with customers, partners or SAP internally. Before the training even commences, job placements are confirmed by these

actors from the SAP ecosystem comprising of SAP partners and customers.



### Industry input

SAP Skills for Africa works in collaboration with different government organisations in each country, e.g. MICT State Information Technology Agency (SETA) in South Africa. The training and content of the curriculum is demand driven which means before any programme commences, the input of partners and customers (e.g. Accenture, TATA, EOH) is taken as to what relevant SAP skills shortage they have and then match graduates into that particular training module.

### Lessons learnt

- Key to the success of the programme is SAP's excellent relationship to a range of customers that operate in markets suffering from ICT skills shortages. Through close collaboration with such recruiters, SAP Skills for Africa obtains vital input for designing course content in ways which ensure that graduates meet the needs of the job market.
- SAP Skills for Africa is partly funded by SAP itself through its CSR budget. For long-term sustainability the funds obtained from hiring partners and customers are essential. Additional support is provided by the government through SETA, including sponsorship for training venues, catering and other events.
- The challenge of a "pop-up shop" approach as applied by SAP Africa is that in every country the company has to create new relationships to try to obtain as much sponsorship as possible, for example in the form of donated training venues.

## Appendix D.3 Maharishi Institute

GIVING STUDENTS A HOLISTIC EDUCATIONAL EXPERIENCE: ACCESS TO FREE UNIVERSITY EDUCATION AND A CONSCIOUSNESS-BASED LEARNING APPROACH THROUGH THE PRACTICE OF TRANSCENDENTAL MEDITATION

### Target group

- Students without the financial means to access further education, e.g. from informal settlements and rural and peripheral areas
- Unemployed youth from historically disadvantaged backgrounds

### Main activities

MI's group of companies have trained over 2,000 students in ICT and have placed them in jobs across South Africa. Every year a further 200 – 300 students are enrolled in the degree programme. At the foundation level or the first year of studies, students can gain skill-based certificates through partner organisations that are registered in South Africa. Additionally, at the Institute's IT Academy, students can gain expertise in Microsoft curricula and certifications through its e-learning platform, extensive teaching resources, computer basics to high-level programming and architecture skills, and various job-readiness and job-relevant IT skills.

The students who show an aptitude in ICT join the Invincible IT programme at the Maharishi Institute where they receive additional work experience. This model was piloted with 10 students in 2016, all of whom have completed the programme and are now employed. The programme is now being rolled out to take in a further 50-100 students a year. The intention is to have around 300 learners every year who access the IT programme through the Maharishi Institute and having various exit points with various levels of qualifications over a period of four to five years. These levels include specialisations in Microsoft, Cisco and SAP certifications, and further specialised technical training interventions such as coding, web development and data management.

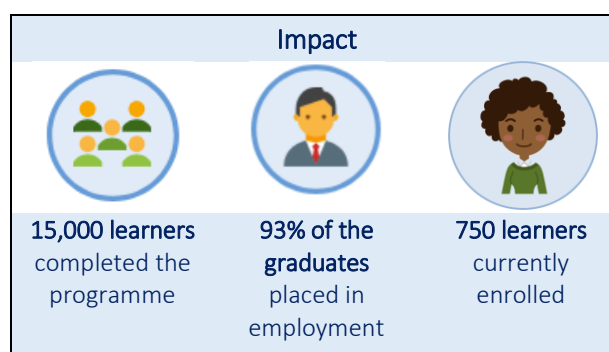
Students access the higher degree programmes via distance education while gaining work experience. This is known as the "Learn and Earn" model. Students who have already graduated from their foundation courses work part-time at the Institute's Outsourcing call centre on the MI campus. This has the added advantage that participants benefit from experience of multiple roles as the call-centre has various

departments, i.e. Marketing, Human Resources, Accounting and others.

MI also provides comprehensive support programmes to its students. For their first year of studies, students receive interest-free loans, which they can pay back in instalments once they graduate and are successful in finding employment. Students also receive a free daily lunch and free clothing; and leadership training weekends at the Institute's sister school at the Ezemvelo Nature Reserve.

MI has a foundation in consciousness-based teaching and learning; students and staff begin each day with yoga and transcendental meditation for a holistic university experience. A majority of students come from violent hometowns and this approach seeks to help close the divide between traditional learning methods and students' oftentimes traumatic pasts. Students accessing the vocational qualifications also participate in the work programme where they are able to develop and apply their skills.

Over 14,050 young people have been placed into employment since the beginning of MI's various programmes. More than 5,500 graduates coming from disadvantaged communities are earning upwards of 230 million RSA in salaries. Hundreds of graduates have been employed in the banking sector; over 2,000 graduates work in the ICT sector as programmers and network engineers; and others have been employed at the Johannesburg Stock Exchange, in the government or have started their own companies.



### Industry input

MI provides its students access to external academic programmes by partner institutes – for example by offering foundational certificates through Media Works, an education and training provider. MI is a certified Microsoft Academy and Certiport Centre and is able to offer qualifications through SETA, the South

African authority where vocational qualifications are registered. MI also has a partnership with Master Skills, a leading South African educational content provider.

### Lessons learnt

Key lessons learnt include the following:

- A provider of ICT training such as MI needs to have a solid understanding of current job needs, especially given the economic situation and market outlook in South Africa. The course programme must be designed and continuously developed according to employer needs.
- Much effort is needed to retain students in the foundation phase due to social and economic stressors that they experience. Once they are established in the programme, they do tend to stay and develop their skills.

- Whilst generous donations from partners and stakeholder organisations were required for the set-up phase, it soon became obvious that a self-funding model is needed for achieving sustainability. To become economically self-sufficient, MI launched its own call-centre and entered the Business Process Outsourcing (BPO) market in South Africa with much success. The “Learn and Earn” model is used for staffing the call-centre.
- MI benefits from government support in the form of training tax breaks given to corporate partners who invest in the programmes through learnerships and Internship offerings.

Based on the success of the “Learn and Earn” model, the Institute now seeks to establish higher educational institutions across Africa built on similar models.



**NEW SKILLS <sup>AT</sup> WORK**  
J.P.Morgan