



# TVET in Construction

Infrastructural investment, construction trends  
& TVET initiatives in **South Africa**

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## SUMMARY

This report analyses the challenges, opportunities and successes within the Technical Vocational Education and Training (TVET) sector in South Africa, especially as it strives to meet the burgeoning demand for skilled labour in the construction sector.

**While TVET plays a key role in counteracting a critical shortage of skilled workers in South Africa, the system struggles to deliver graduates with the needed skills.**

During the apartheid era, infrastructure investments primarily served the white minority, neglecting the majority's needs in education, healthcare, housing and skills development. This legacy has contributed to **ongoing poverty, inequality and a lack of adequate skills development for 80% of the South African population.**

To create a workforce capable of supporting infrastructural growth and economic development, **TVET must address pedagogical gaps, enhance private sector involvement and better align with industry needs.** Specific challenges are a lack of good lecturers, resource shortages, misaligned curricula and governance issues.

Because TVET is essential for the future of construction in South Africa, it is vital **to continue developing and testing innovative TVET concepts aimed at reducing the skills gap in the construction sector at all levels.** Besides bolstering TVET colleges, work-based learning (WBL) shows particular promise.

# WORK IN PROGRESS: THE GROWING INFRASTRUCTURE DEMAND

## CONSTRUCTION SECTOR TRENDS FROM A GLOBAL PERSPECTIVE

### TREND 1:

#### INFRASTRUCTURE INVESTMENT AND LABOUR DEMAND ON THE RISE

Infrastructure is key for economic growth and development. The current need for investment must deliver an efficient construction sector with the potential to offer abundant job opportunities.

Globally, several factors are contributing to the growth in infrastructure investment and the resulting labour demand:



#### WORLD POPULATION GROWTH:

Expected to rise from 7.5 billion in 2017 to nearly 10 billion by 2050, with the majority in emerging and developing countries (EMDCs). The population of the African continent is set to double to 2.5 billion by 2050.



**ECONOMIC GROWTH IN EMDCs:** These regions require new infrastructure to support their expanding economies and growing middle classes.



#### URBANISATION REQUIRES MORE COMPLEX INFRASTRUCTURE:

About two-thirds of the world's population will live in urban areas by 2050, an increase of 2.5 billion people (United Nations, 2014).



#### CLIMATE CHANGE ADAPTATION AND MITIGATION:

Investments are needed for new systems and lower-carbon infrastructure technologies.

The McKinsey Global Institute (2016) notes that by 2030, global investment in economic infrastructure must reach about 3.8% of global GDP, equal to roughly USD 3.3 trillion annually. The investment is essential to sustain expected growth rates<sup>1</sup>. Emerging economies are expected to take up about 60% of that amount.

A functional construction sector is crucial to ensure robust, long-term labour markets. **Developing a skilled workforce is therefore key for enhancing living conditions.**

## TREND 2: GLOBAL SKILLED LABOUR SHORTAGE

Labour shortages are on the rise and two-thirds of global construction markets report skills shortages.<sup>2</sup> Why is that?

The construction industry offers many career opportunities, but **it is seen as the realm of unskilled workers, not career-seekers.**

**Demanding work conditions, security risks, complex yet undervalued tasks and intense competition contribute to this trend.**

There is a **significant gender gap**: less than 10% of women are currently entering the sector.

Furthermore, **TVET systems are not giving graduates the needed on-the-job skills**, leaving them unprepared for the realities of the job.

<sup>1</sup> Mc Kinsey Global Institute, Bridging Global Infrastructure Gaps, Full Report, June 2016

<sup>2</sup> [www.turnerandtowntsend.com](http://www.turnerandtowntsend.com), upload 6 Nov 2020

### TREND 3: QUALITATIVE APPROACHES TO TACKLE THE SKILLS SHORTAGE

Improving the labour market requires coordinated efforts from both political entities and the construction industry. **Dual Training** is a viable model of reforming TVET, but it requires significant time, investment and human resources at the national level.

The construction sector is striving to modernise work processes and structures to improve the labour market. However, **approaches that reduce the overall need for labour, such as increased automation or specialisation, raise skill standards for new employees.** Additionally, the scope and timing of contemporary construction investments are overwhelming for many contractors, particularly small and medium-sized enterprises.

The competitive nature of the industry often hinders cooperation. Previously, competent contractors managed the full spectrum of tasks within their trade. Today, **many are compelled to focus their skilled staff on core tasks and outsource simpler jobs to lower-cost subcontractors.** This practice has led to a two-class system and increased risks on sites. Many employers also feel the need to outsource tasks they cannot manage internally instead of developing their personnel.

#### TREND 4: STRATEGIES TO BRIDGE THE FINANCE GAP IN INFRASTRUCTURE

Infrastructure investments are capital-intensive with long-term repayment schedules. Adding to this difficulty, they frequently involve significant price dumping, other diverse risks and complex supply chains.

Traditionally, infrastructure financing is a government responsibility, supported by national public funds. However, public deficits and debts – and sometimes the public sector’s inability to manage the tasks – can often lead to shrinking public budgets. **Official Development Assistance (ODA) funds, though beneficial in developing countries, cover only about 10% of the total investment needed.**

**Significant private investments of USD 1.5 trillion have been mobilised in the past decade. However, this represents only 10% of the required investment.** Many infrastructure projects, particularly in low-income countries, offer limited returns, making them less attractive to private investors.

Multilateral Development Banks (MDBs) have opportunities to improve balance sheet management through exposure swaps. Risk-transfer mechanisms with other MDBs can diversify portfolios and potentially support credit ratings, freeing up more capital for investment.<sup>3</sup>

<sup>3</sup> <https://www.sc.com/en/feature/multilateral-development-banks-clear-path-to-closing-the-worlds-infrastructure-gap>

## ENTER BUILD4SKILLS

The German Federal Ministry for Economic Cooperation and Development (BMZ), the Asian Development Bank (ADB) and the African Development Bank (AfDB) jointly implement the global Build4Skills project in Kenya, Mongolia, Pakistan, Senegal and South Africa.

Build4Skills operates on a simple yet practical premise: why not utilise the untapped potential of ongoing infrastructure projects to train TVET students on-site? Work-based and nationally accredited training on the construction sites of infrastructure projects won't only enhance the employability of the local workforce but improve TVET graduates' prospects for securing decent work and higher incomes. The long-term aim is to make TVET a prerequisite in tendering processes for infrastructure projects – akin to social and environmental standards.





# CONSTRUCTION SECTOR TRENDS IN SOUTH AFRICA

## RELEVANCE AND BACKGROUND OF THE SECTOR

The impact of apartheid in South Africa led to widespread poverty and inequality, which the succeeding democratic state is still grappling with today. The government is still working to fix inequalities and re-focus the economy on regional and international trade.

**South Africa's construction market was valued at USD 25.5 billion in 2022 and is expected to achieve an Average Annual Growth Rate (AAGR) of more than 3% from 2024 to 2027.**



The country's construction industry is expected to improve in 2024, supported by investments in transport, renewable energy and water infrastructure projects. Growth will also be supported by investments as part of the South African Automotive Masterplan (SAAM) 2021-2035 and by the mega solar power plant 5,000MW programme, which the government is undertaking with an investment of ZAR 20.1 billion (USD 1.2 billion).<sup>4</sup>

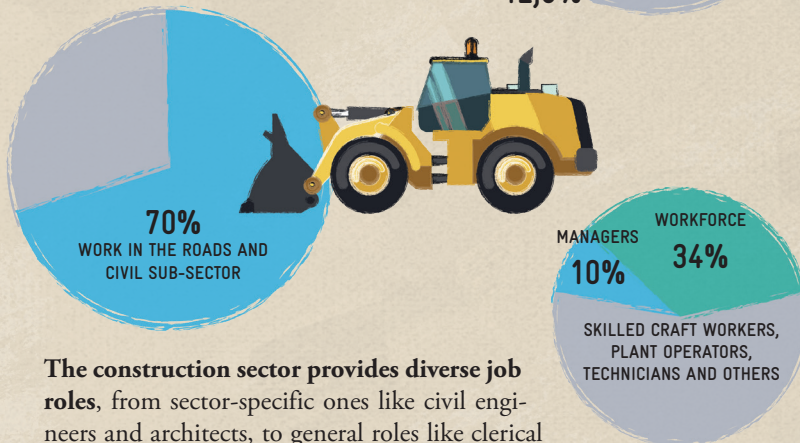
<sup>5</sup> <https://www.news24.com/news24/bi-archive/infrastructure-projects-2020-6>

## LABOUR MARKET SPECIFICS

Firms in the South African construction sector vary widely in size and ownership, from sole proprietors to large multinational construction groups.

On average, **informal employment makes up 35% of total employment in the sector**, compared to 21% in non-agricultural sectors. **And the percentage is rising.**

The construction sector predominately employs men. Peaking at 12.5% in 2017, **female participation is well below the overall average** of 44% female employment. Most employees in the sector, nearly 70%, work in the roads and civil sub-sector.



**The construction sector provides diverse job roles**, from sector-specific ones like civil engineers and architects, to general roles like clerical support and sales staff. Elementary occupations form the largest group, comprising nearly 34% of the workforce, surpassing the national average of 23%. This is followed by skilled craft workers, plant operators and technicians. Managers make up 10% of the industry's employees, slightly above the national average of 9%.

## MAJOR INFRASTRUCTURAL INVESTMENTS

In South Africa, public and private capital investment represented 17.9% of GDP in 2019, but **investment needs to rise to bolster economic growth and reduce poverty**. Government investment capacity has been strained by revenue shortfalls and increasing spending demands. The National Development Plan (NDP) 2030 plans for 30% of GDP to be invested in capital. To meet this goal, **public sector investment should grow from 5.4% of GDP in 2019 to 10% by 2030, while private sector infrastructure investment needs to increase from 12.5% of GDP in 2019 to 20% in 2030**.

Despite these challenges, **South Africa ranks in the top 10 African countries** in the African Infrastructure Development Index (AIDI), updated annually by the African Development Bank. The AIDI evaluates electricity, transport, ICT, as well as water and sanitation indicators.

Efforts are under way to increase capital investment with a view to future projects. Approximately **14 major projects are currently in planning**.<sup>5</sup> Among these, the **Mokolo Crocodile Water Augmentation Project** near Lephalale is notable for its 160km pipeline and associated pump stations aiming to improve local water supplies. Also notable, the **Greater Cornubia development near Durban** is a substantial urban development initiative near King Shaka International Airport, which will include 58,000 residential units along with industrial and commercial properties.

The New Development Bank (NDB), established by the BRICS nations, has provided South Africa with 100 billion rands (equivalent to USD 5.27 billion) to support infrastructure projects including road construction, water supply and energy initiatives.<sup>6</sup>

<sup>5</sup> <https://www.news24.com/news24/bi-archive/infrastructure-projects-2020-6>

<sup>6</sup> <https://www.republicworld.com/world-news/global-event-news/brics-bank-ndb-provides-south-africa-with-usd-5-billion-for-infrastructure-endeavours-articleshow.html>

## DEMAND AND PROVISION OF LABOUR IN SOUTH AFRICA

### LABOUR MARKET DEMAND

There is a global shortage of construction-specific skills, which in South Africa is intensified by a historic lack of investment in educating the non-white majority. The influx of substantial reconstruction and development funds, combined with a loss of critical skills, worsened the situation, hindering construction's ability to meet the basic needs of the population.

In the past two decades, the labour market and industry skills requirements have evolved significantly. There is a skills shortage across various roles, including managers, professionals and artisans, with **the most notable skills gap among skilled artisans and supervisors.**<sup>7</sup>

The top 10 in-demand jobs in South African construction<sup>8</sup>:

- Construction project manager
- Civil engineer
- Civil engineering technologist
- Architect
- Civil engineering technician
- Building inspector
- Carpenter
- Plumber
- Steel fixer
- Electrician



<sup>7</sup> <https://sajhrm.co.za/index.php/sajhrm/article/view/750/1032>

<sup>8</sup> <https://www.fieldwire.com/blog/top-10-in-demand-construction-jobs/>

As part of drafting this report, interviews were conducted with South African construction companies and trade associations. Companies reported on hard-to-find skills among the top-ten jobs.

In their view, **the main reason for scarcity is the requirement for certification.**

There are simply not enough people practicing these trades with certification. These include plumbers, carpenters, tilers, electricians, welders, bricklayers and plasterers. Other scarce skills mentioned by companies include skills for jobs in the renewable energy sectors, community home building and soft skills, such as problem solving and critical thinking.

#### Factors influencing skills shortage<sup>9</sup>:

- Need for certification
- Poor image of the construction industry
- The government's role
- Quality and relevance of artisan training
- Ageing workforce
- Cyclical nature of construction service demand
- Technological advancements
- Economic conditions



<sup>9</sup> <https://sajhrm.co.za/index.php/sajhrm/article/view/750/1032>

## GROWING CONSTRUCTION TRENDS WITH ELEVATED SKILLS REQUIREMENTS

The future of skills requirements in South Africa can be inferred from trends such as globalisation, innovation and competitiveness. This goes hand-in-hand with **critical skill sets that workers will need, but which are not necessarily provided by traditional institutional learning.**

**Broad categories of skills gaps include critical thinking and problem-solving, leadership, resilience, agility and adaptability, communication, interaction with ICT and creativity<sup>10</sup>.**

An assessment of current and future critical skills in the South African construction industry conducted by Musonda (2021) suggests that the **top-ranked skills included health and safety management, decision-making, leadership, problem-solving skills and sustainability.**

In their foresight study on technology development in the South African construction industry, Rust & Koen (2019) utilised insights from both qualitative and quantitative analysis, as well as input from industry thought leaders and middle management. They found **the following key technology focus areas would require specialised workforce attention in the South African construction sector to align with future trends:**

- Advanced materials and products
- ICT and robotics
- Alternative energy systems for the built environment, especially solar power
- Housing and alternative technologies for municipal service delivery
- Clean processes and technologies
- Logistics and supply chain optimisation

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<sup>10</sup> <https://www.ceta.org.za/files/files/CETA-SSP-202122-202526.pdf>

## LABOUR MARKET SUPPLY

The South African labour market is characterised by an oversupply of unskilled workers and a shortage of skilled workers.<sup>11</sup>

Trades such as electrical, plumbing and welding are particularly affected.

Research suggests that **the skilled labour shortfall is caused by the lack of basic education, declining economic growth and the need for certification.**<sup>12</sup>

In South Africa, **the construction sector is perceived negatively due to its low social standing, physically demanding nature, long hours, remote work sites and nomadic lifestyle** (CIDB, 2007).

This perception, along with a growing preference for computer-based work over hands-on labour, has made it **difficult for the sector to attract young talent**, leading to a shortfall in replacing outgoing labour (Cattell, 1997).<sup>13</sup>

Based on the interview discussions and the online questionnaires from the Construction Education and Training Authority, a major issue is that **managers and professional-level employees often lack leadership, management and financial skills.**

**Reported skills gaps in lower-level positions mainly involve problem-solving, critical thinking and computer literacy.**

Stakeholders strongly believe that the skills gap is largely due to the poor quality of mathematics and science education in schools, which impacts engineering-related skills.<sup>14</sup>

Most large construction firms in South Africa use a model of outsourcing to subcontractors, hiring contract workers for additional manpower or specialised skills. This leads to a situation where the smaller contracted companies often hire very low-skilled workers “off the street”, which does not increase motivation to train and upskill temporary workers.

<sup>11</sup> <https://sajhrm.co.za/index.php/sajhrm/article/view/750/1032>

<sup>12</sup> <https://www.ceta.org.za/files/files/CETA-SSP-202122-202526.pdf>

<sup>13</sup> <https://sajhrm.co.za/index.php/sajhrm/article/view/750/1032>

<sup>14</sup> <https://www.ceta.org.za/files/files/CETA-SSP-202122-202526.pdf>

## PROVISION OF TRAINING

**While TVET plays a key role in counteracting a critical shortage of skilled workers in South Africa, the system struggles to deliver graduates with the needed skills.**

Public TVET provision in South Africa is broad in scope, covering TVET colleges, in-house training centres, training centres of state-owned companies (SOCs), workplaces, assessment centres, dedicated occupational colleges, technical high schools, schools of skill, and universities of technology.

According to the National Development Plan, **Technical Vocational Education & Training (TVET) colleges are essential to tackle the skills shortage.** The plan suggests reversing the current situation in which more school graduates go to universities than colleges.

The total planned TVET placement for 2023 was 556,415.

According to the interviews conducted for this report, **companies in South Africa collaborate with TVET colleges in multiple ways:**

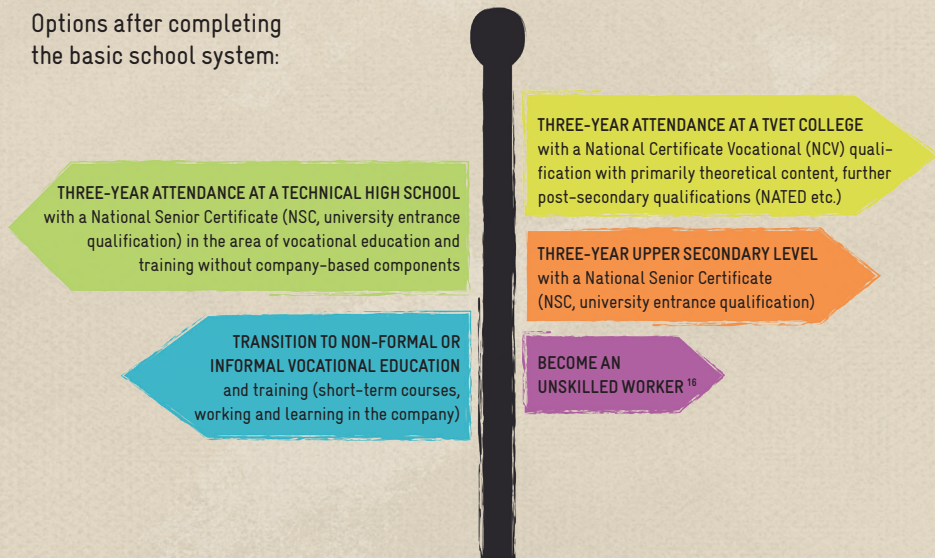
- Training learners to become qualified artisans
- Coordinating work-based learning
- Serving as lead employer to facilitate learner placement
- Promoting work experience opportunities
- Helping TVET colleges upgrade training workshops
- Upskilling TVET graduates

**Overall, the interviewed companies and stakeholders reveal a willingness to collaborate with TVET colleges to improve the quality of artisans entering the workforce.**



## PROVISION OF TVET

Options after completing the basic school system:



The 50 public TVET colleges located throughout South Africa offer a variety of coursework in different fields, such as business studies, engineering, hospitality, art and design, agriculture and more. Other providers of TVET range from public and private institutes of higher education to in-house training.

It is important to note that **TVET colleges offer greater potential to expand access to training – despite concern over the quality of lecturers, resources, curriculum and governance.**

In response, the **government of South Africa has set up measures to improve the quality of education in TVET colleges**, for instance by providing financial support to students who cannot afford tuition fees through the National Student Financial Aid Scheme (NSFAS).

Efforts are also underway to align TVET college programmes with industry demands by fostering collaboration between the colleges and the private sector.<sup>16</sup>

<sup>16</sup> Govet / Südafrika

<sup>16</sup> <https://caps123.co.za/tvet-colleges-in-south-africa-a-guide-to-vocational-education/>

## ONGOING REFORMS

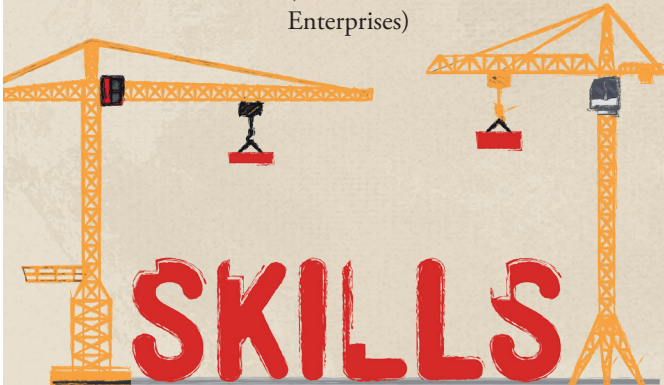
South Africa's TVET sector has undergone many reforms since its establishment in 2002. It has focused on modernising and integrating vocational training with industry needs and global economic demands, emphasising quality and workplace relevance in education and training.

The National Skills Development Plan 2030 continues to support the growth of TVET colleges and the establishment of Centres of Specialisation for occupational programmes, where possible. There are 26 Centres of Specialisation at 19 selected TVET colleges to ensure that institutes have the capacity to offer the required qualifications.

## NEW APPROACHES TO FILLING THE SKILLS GAPS

According to interviews for this report, construction companies use the following methods to close skills gaps:

- Establishment of private training academies
- Contractor development programmes
- Women's trade capacity building
- Entrepreneurial development programmes for SMMEs (Small, Medium and Micro Enterprises)
- TVET college support
- Artisan curriculum development
- Work-based learning (WBL) intermediation for SMMEs
- Lead employer model for WBL
- TVET lecturer training
- TVET workshop upgrades
- In-house, on-the-job training



## SUMMARY OF FEEDBACK FROM INTERVIEWED COMPANIES THAT HOST TRAINEES

### POLICIES TO ENABLE COMPANIES TO EMPLOY TRAINEES

The South African Skills Levies Act mandates a 1% payroll levy for workforce training, but it only applies to larger companies. Companies who pay the levy receive reimbursements and grants for hosting trainees, such as those in TVET programmes.

However, this does not apply to most construction sector companies, which are generally SMMEs. As a result, these SMMEs are **often excluded from hosting trainees unless supported by a levy-paying lead employer or association.**

For such companies, government policy is not a key driver for hosting trainees. Instead, they are motivated by other factors, including those discussed below.

### FACTORS THAT MOTIVATE COMPANIES TO HOST TRAINEES

The interviewed companies indicated factors that motivate them to take on trainees. These range from altruistic ideals to business needs.

#### **Business-related motivation to take on trainees include:**

- Leveraging skills funding to increase workforce capacity without impacting the bottom line
- Enhancing company sustainability and continued access to skilled artisans as members of the workforce retire
- Supporting sector access to quality artisans

According to the interviews, factors that help encourage companies to host trainees include the **willingness of the Construction Education and Training Authority to sign an agreement with employer bodies**, in which they commit to paying trainee stipends in advance of the initial grant payment.

Another enabling factor is the **lead employer/host employer model**. This

model assists SMMEs lacking the administrative capacity to manage the bureaucracy associated with hosting trainees.

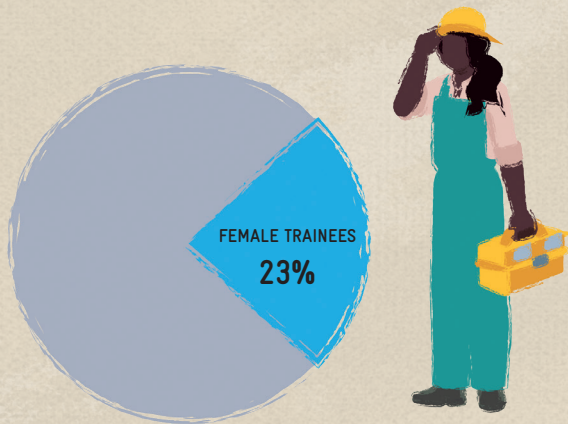
Interviewees also stated that it would be beneficial to **expand the funding of trainee hosting** to companies exempt from the skills levy.

Among interviewed companies who were at liberty to share financial details, the **total investment in training was equal to 2-40% of annual budgets/costs**.



## GENDER REPRESENTATION OF EMPLOYEES AND TRAINEES

On average, the companies interviewed reported **23% female trainees**, with individual figures varying from 0% to 70% female representation. The highest reported percentage of female employees in the overall workforce of these companies was 20%.



## AVAILABILITY OF INSTRUCTORS/TRAINERS

With the exception of larger companies with their own training academies, **most SMMEs and industry bodies that participate in WBL do not have in-house instructors/trainers**. Instead, they rely on Quality Council for Trades and Occupations (QCTO) skills development providers from private and public TVET colleges.

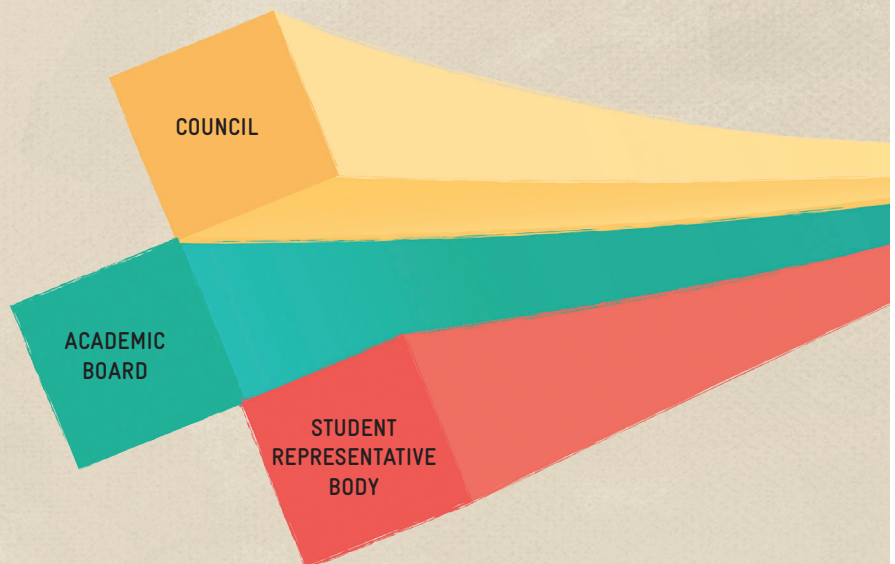
These providers employ instructors/trainers that follow a curriculum with clear learning outcomes. The curriculum for WBL includes the availability of a supervisor at a host employer who serves as a mentor to a placed trainee. These supervisors record the progress of a trainee on a logbook which is checked and verified regularly by a lead employer where the lead/host employer model is adopted.

## GOVERNANCE AND FINANCE

The TVET governance framework is based on the principles of **cooperative governance**. It gives the government a strong steering role, with TVET institutions having substantial power and partnerships with the government, organised business, labour and communities. The Department of Higher Education and Training is responsible for steering the TVET sector. Its primary role is to develop policy, norms and standards as well as the national curriculum, while also developing staff, targeting students, securing funding and updating policy implementation.

**TVET institutions practice a tripartite governance structure consisting of a council, an academic board and a student representative body.** Each institution enjoys strong stakeholder representation.

The **Sector Education and Training Authorities (SETAs)** act as the primary source for providing credible information on the supply of and demand for skills. SETAs also distribute discretionary funds for purposes of upgrading skills in the workforce. They also fund TVET colleges on special programmes. SETAs act as the bridge between students and workplaces by creating interventions and shaping solutions on skill demands within a given sector.



## RECOMMENDATIONS

The following are recommendations for the Build4Skills Programme in South Africa based on the context as gleaned from the findings of this study.

1. Seek strategic partnerships with large construction companies for WBL as these also tend to have training academies that invest in skills development;
2. Prioritise SMMEs for participation in WBL as they collectively account for the majority of employees in the construction sector;
3. To enable SMME participation as host employers, build partnerships with industry bodies as they are capable to play the role lead employer with administrative capacities to manage required WBL administrative processes and are levy paying;
4. To further scale up, establish a grant fund mechanism to enable allocations directly to non skills levy paying SMMEs. In addition to covering trainees stipends and other related costs, this grant should include an allocation to cover the personnel and other costs required to ensure that SMME's can have internal capacities to manage WBL processes.





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