ETDP-SETA IMPACT OF COVID-19 STUDY

BUILDING A RESILIENT SKILLS ECOSYSTEM: SITUATIONAL ANALYSIS REPORT ON THE FORWARD PATH OF EDUCATION AND TRAINING IN LIGHT OF THE PANDEMIC AND 4IR/5IR SHIFTS IN THE ETD SECTOR

TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING SUBSECTOR

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SITUATIONAL ANALYSIS REPORT ON THE FORWARD PATH OF EDUCATION AND TRAINING
IN LIGHT OF THE PANDEMIC AND 4IR/5IR SHIFTS IN THE ETD SECTOR

HIGHER EDUCATION SUBSECTOR

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List of Abbreviations

Abbreviation	Description
4IR	Fourth Industrial Revolution
5IR	Fifth Industrial Revolution
ABET	Adult Basic Education and Training
CDO	Career Development Officers
CET	Community Education and Training
CFO	Chief Financial Officer
COPEC	College Lecturers Programme Evaluation Committee
COS	Centres of Specialisation
COVID-19	Coronavirus disease
CPD	Continuing Professional Development
DHET	Department of Higher Education
ETD	Education, Training and Development
ETDP SETA	Education, Training and Development Practices Sector Education and Training Authority
ETF	Education and Training Foundation
EU	European Union
FET	Further Education and Training
GDP	Gross Domestic Product
GENFETQA	General Further Education and Training Quality Assurance
HEI	Higher Education Institution
HEQC	Higher Education Quality Committee
HSRC	Human Sciences Research Council
ICT	Information and Communications Technology
IIEP	International Institute for Educational Planning
ILO	International Labour Organisation
IT	Information Technology
KZN	KwaZulu Natal
LMS	Learner Management System
MTEF	Medium-Term Expenditure Framework
NATED	National Accredited Technical Education Diploma
NQF	National Quality Framework
NSDP	National Skills Development Plan
NSF	National Skills Fund
NSFAS	National Student Financial Aid Scheme
OECD	Organisation for Economic Co-operation and Development
PGDip	Postgraduate Diploma
PLP	Pre-Vocational Learning Programme
PPP	Public-private partnerships
PSET	Post-School Education and Training
QCTO	Quality Council of Trades and Occupations
RPL	Recognition of Prior Learning
RVA	Recognition, Validation and Accreditation
SA	South Africa
SACE	South African Council for Educators
SACPO	South African Public Colleges Organisation

SAIVCET	South African Institute for Vocational and Continuing Education and Training
SETA	Sector Education and Training Authority
SRC	Student Representative Council
STEM	Science, Technology, Engineering and Mathematics
TVET	Technical and Vocational Education and Training
TVETMIS	Technical and Vocational Education and Training Management Information System
UK	United Kingdom
UNESCO	United National Educational, Scientifica and Cultural Organisation
UWC	University of the Western Cape
WB	World Bank
WBG	World Bank Group
WIL	Work-Integrated Learning
WPPSET	White Paper for Post-School Education and Training

APPROVAL OF THE RESEARCH REPORT: BUILDING A RESILIENT SKILLS ECOSYSTEM: SITUATIONAL ANALYSIS REPORT ON THE FORWARD PATH OF EDUCATION AND TRAINING IN LIGHT OF THE PANDEMIC AND 4IR/5IR SHIFTS IN THE TVET SUBSECTOR.

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ABSTRACT

The Technical and Vocational Education and Training (TVET) sector in South Africa plays a vital role in developing skills and improving employability of youth. However, the sector has faced challenges including poor student performance, low throughput rates, and insufficiently qualified lecturers. The Coronavirus (COVID-19) pandemic further disrupted the sector, forcing a shift to remote learning which TVET colleges were ill-equipped to provide effectively. Key impacts of COVID-19 include closures of campuses and loss of learning time; inequities in access to resources needed for remote learning; and disruptions to critical work placements and skills development.

To build resilience, the sector needs increased capacity for e-learning, upgraded Information and Communications Technology (ICT) infrastructure, revised curricula, and lecturer upskilling. Partnerships with industry can also help secure work placements. As the sector adapts to the 4th Industrial Revolution, priorities include digital transformation of operations, modernizing equipment and labs, integrating new technologies into programs, and readying lecturers and students with digital/ Science, Technology, Engineering and Mathematics (STEM) skills. Targeted investments, public-private collaboration, and a commitment to equity and quality will be vital in enabling the TVET system to meet national goals. With the right support, the sector can leverage opportunities emerging from recent crises to transform and fulfil its mandate of developing South Africa's workforce.

1 INTRODUCTION AND CONTEXT

The (Coronavirus) COVID-19 pandemic has had an unprecedented impact on the national economy, creating uncertainties regarding the scope and nature of implications for various sectors. The education and training sector is no exception, with students, employers, and employees all being affected. The ETDP SETA, mandated with promoting and facilitating skills development with the aim of improving the skills profile of the workforce in the education, training, and development sector, now faces the arduous task of planning for and implementing policy that will position the sector well to respond to the implications of COVID-19.

However, planning, policymaking, and implementation require a clear assessment of the impact of COVID-19 on its 14 constituencies or sub-sectors of which Technical and Vocational Education and Training (TVET) is one. Obtaining robust intelligence on the state of skills supply, demand, and shortages within the sector is at the heart of this endeavour. Additionally, reflecting on the emerging skills and related challenges is necessary to inform the planning and implementation of appropriate interventions, as well as general funding decisions and allocation of resources from the SETA to support its various sub-sectors.

The fundamental concern facing the ETDP SETA, and the main objective of this study, has been to determine the impact of the COVID-19 pandemic within the context of the fourth industrial revolution on the education and training sector. This requires engagement within the context of the Fourth Industrial Revolution (4IR) and its impact on skills development training needs and interventions. With the dual challenges of the 4IR and the COVID-19 pandemic, the education and training sectors are undoubtedly facing unprecedented upheavals. The 4IR, characterised by breakthroughs in fields like Artificial Intelligence (AI), robotics, and the Internet of Things, demands new skill sets and learning paradigms. Coupled with the disruptions caused by the pandemic, understanding this impact is pivotal for future planning and ensuring the relevancy of education, training, and skills development.

Towards this end, this evidence review focuses on what is known about the status of skills

development and labour market information recovery arising from COVID-19 and changes because of 4IR/5IR in the TVET sector, one of the fourteen (14) subsectors which are under the ETDP SETAs authority.

Technical colleges in South Africa date back as far as the 1800s with the demand for technical training stemming from the need to equip post-schooling youth with industry-relevant knowledge and skills that enhance employability (Terblanche & Bitzer, 2018). In 2002, 152 former technical colleges were transformed, in terms of the FET Act 98 of 1998. In 2020 the TVET subsector consists of 50 multi-campus colleges, with 250 campuses and 452 277 enrolments. The TVET sector plays a vital role in socioeconomic development in South Africa requiring Technical Colleges and Technical Institutions to provide vocational and occupational training programmes which increase the employability of students or prepare them for higher education. The DHET (2019a, p. 15) stated "The main purpose of TVET is to prepare students for the world of work", which is vital for the development of South Africa. Furthermore, the European Union (EU) refers to the TVET sector as the "engine of economic development and international competitiveness" (Azzoni & Arbizu, 2013, p. 2). Kraak (2018) noted that, worldwide, TVET colleges are related to employability focusing on relevant labour market skills, human development intermediate skills and globalisation. However, despite the potential of the TVET sector to progress and transform society, authors including Rawkins, (2018), Papier (2021) and Scheepers & Gebhardt (2021) noted that in developing countries the sector falls behind in performance in terms of outcomes including throughput rates, skills development, and employability. In South Africa, Sibiya et al. (2021) argued that although the unemployment level for university graduates was approximately 7% in 2017 (StatsSA, 2018), the unemployment rate for TVET graduates stood at 33%.

The literature review first outlines the context of the TVET sector and presents a sector profile, including information on relevant legislation, role players, scope of programmes and qualifications, governance, and partnerships. TVET college enrolment figures expanded rapidly between 2010 and 2019 given the increased funding available to students through the National Student Financial Aid Scheme (NSFAS) student loans. The DHET (2020a) has set ambitious goals to strengthen and expand the sector to significantly increase the employability of youth in South Africa. However, the COVID-19 pandemic resulted in

enrolment setbacks.

Section three presents the state of the subsector before the COVID-19 period and discusses funding, staffing profile, enrolment, throughput, and employment outcomes. Section four discusses the impact of the COVID-19 pandemic on education, skills training, curriculum, and pedagogy in the TVET sector. It is emphasised that at the onset of COVID-19, the sector suffered from inadequate Information and Communications Technology (ICT) infrastructure and lecturers lacking training in online learning pedagogies, hampering a smooth transition to remote and e-learning. Emerging trends regarding staff complements, ways of working, curriculum reforms, skills development, and training practices are discussed. Upskilling and professionalisation of TVET lecturers have been noted as vital for the TVET sector's sustainability and relevance in the 4IR.

Section five presents the anticipated structural changes, highlighting how the manner of operating in the TVET sector has changed because of the COVID-19 pandemic. Blended and multimodal approaches to teaching and learning are discussed, along with resultant challenges and opportunities. Section six presents adopted coping and adapting strategies, including building resilience and infrastructure to ensure the TVET sector's ability to cope with future disasters and adapt to 4IR requirements towards fulfilling its mandates. Section seven focuses on resource allocation and priorities before and after the pandemic, while section eight reflects on reviewing the ETDP Sector Skills Plan of 2023. Finally, information gaps and possible areas of future research are presented, followed by conclusions on COVID-19's impacts and 4IR implications for the TVET sector. Recommendations for improving operating procedures in the sector are provided.

2 MAPPING THE SUBSECTORAL CONTEXT

The post-school education and training institutions consist of both public and private institutions which include Higher Education Institutions (HEIs); TVET colleges and Community Education and Training (CET) colleges (DHET, 2022). The TVET sector covers all the public TVET colleges and private colleges/institutes which provide education and training at the Further Education and Training (FET) level. The White Paper for Post-School Education and Training (WPPSET) (DHET, 2019a) refers to the pivotal role that TVET colleges play in the Post-School Education and Training (PSET) sector, which is to bridge the gap between education and work. The most significant element of TVET colleges is thus the approach toward the workplace and the curriculum's focus on employability skills (Terblanche & Bitzer, 2018).

TVET colleges in South Africa offer three main qualification categories including the: National Certificate (Vocational) or NC(V); the Report 191 National Accredited Technical Education Diploma (NATED) programmes; and the occupational qualifications and part qualifications (Papier, 2021). Beyond class work, the TVET qualifications include a Work-Integrated Learning (WIL) component, which is aimed at ensuring that students gain the knowledge, skills and attitudes required to enhance and successfully adjust to the workplace (DHET, 2013).

Students applying to study at the TVET sectors must be at least 16 years or older and the minimum level of qualification is a Grade 9 or ABET level 4 certificate for N1 admissions and grade 12 for N4 admissions (DHET, 2019b). The courses range from education, tourism, agriculture, engineering, arts and crafts to business management and administration (DHET, 2022). TVET learners may graduate with certificates or diplomas for the varying courses. The courses combine theoretical with practical training, and to graduate with a national diploma a student must complete the N6 course and the WIL component.

The ETDP SETA (2021) stressed that the WIL component was introduced to ensure that industry and the education sector work together to ensure human capital development in South Africa. The TVET sector thus needs to partner and cooperate with the relevant industries to successfully place students for the WIL component towards meeting labour

market demands (Scheepers & Gebhardt, 2021). Clear communication, effective organisational procedures and managing stakeholder's expectations are elements required for an effective WIL programme. Skills gained from the WIL component should not be restricted to employability outcomes but add value to lifelong occupational success (Knight & Yorke, 2003). Industry stakeholders are required to provide quality supervision and mentoring of students in the workplace (Fleming et al., 2018). Furthermore, for the WIL programme to be successful it needs to be integrated into the curriculum using pedagogies that link theory and practice.

Magingxa (in NMMU, 2020) noted several challenges facing the WIL component of TVET courses including that during the COVID-19 pandemic companies were retrenching rather than hiring employees. Consequently, students were not able to complete their WIL components of the course and thus graduate with the relevant National Diploma and gain the benefits from the WIL component. Another challenge is that students were not being placed in relevant positions with Magingxa (in NMMU, 2020) providing the example of students training to be legal secretaries placed in cashier positions.

2.1 Policy and Legislation

Numerous policies and legislations have shaped the TVET sector with numerous amendments in the post-Apartheid era. The most prominent policies are (DHET, 2013, 2019b, 2019c, 2019a, 2020b, 2022; ETDP SETA, 2022a; National Treasury, 2022a):

1. Continuing Education and Training Act (Act No. 16 of 2006), (CET Act) previously known as Further Education and Training Act, 2006 (Act No. 16 of 2006) (FET Act). Provides guidance on further education and training colleges.
2. General and Further Education and Training Act, 2001 (Act No. 58 of 2001) (GENFETQA Act). Provides guidance on quality assurance, qualification registrations and accreditation of private assessments.
3. Higher Education Act, 1997 (Act No. 101 of 1997). Acts to regulate Higher Education.
4. National Qualifications Framework Amended Act, 2019 (Act No. 12 of 2019). Regulates the National Qualifications Framework.

5. White Paper for Post-school Education and Training, 2014 (No 11/37229 of 2014). Represents government's vision of a cohesive approach to PSET.
6. South African Council for Education Act, 2000 (Act No. 31 of 2000). Regulates South African Council for Educators.
7. Skills Development Act (Act No. 97 of 1998). Regulates matters related to skills development(DHET, 2019a).
8. Skills Development Levies Act (Act No. 9 of 1999). Provides for skills development levy and related issues.

2.2 Governance and Oversight

The Heher Commission was established in January 2016 to inform government's decision making towards sustainable higher education and training in South Africa (The Presidency, 2017). Concerning the TVET sector the following priority areas were established: Fully subsidised free education and training for all financially needy South African students; improvements in the quality of teaching and learning through investments in TVET staff; and funding for infrastructure improvements in the TVET sector.

Moloi & Adelowotan (2019) studied the corporate governance principles and practices disclosed in annual reports of TVET colleges in South Africa and identified a lack of the application of principles. The result was a broad range of governance issues including poor leadership and administration, insufficient funding and accountability, and failing equipment and infrastructure, which render the TVET sector unable to deliver on its core mandate. To improve governance and performance, Moloi & Adelowotan (2019) noted that government should monitor compliance of fundamental principles in TVET colleges. Matiso (in NMMU, 2020) furthermore highlighted the most important action points to improve the performance of the TVET sector to include a need for a consolidated governance system; improving the capacity of managers; investing more resources and funding; consolidating the financial aid system; strengthening student support services, consolidating current lecturer development Initiatives; and consolidation of student entrepreneurship projects.

Sithole et al. (2022) studied why TVET colleges are struggling to achieve effective management and performance and become post-schooling institution of first choice. It was concluded that management structures at TVET colleges are not given sufficient support to achieve the policy and legislation objectives devised by the DHET. Unfortunately, governance challenges, for example a lack of effective infrastructure and equipment, resulted in the TVET sector unable to fully mitigate the negative impacts of the COVID-19 pandemic (Scheepers & Gebhardt, 2021), thus exacerbating the education and inequality consequences.

In South Africa, a new national Student Representative Council (SRC) structure was elected in 2020 (following two years without such a structure) to ensure students are furthermore represented and engage with the leadership and governance in the TVET sector (Nzimande, in TVET College Times, 2020).

Public-private partnerships (PPP) are a key aspect of TVET governance in the international literature given the mandate of the TVET sector to ensure employability of youth (ETDP SETA, 2022a). Oviawe (2018) identified that TVET institutions cannot successfully develop relevant skills matched with job requirements if it operates in isolation of industries which require the skills of TVET graduates. Government cannot exclusively be responsible for developing skills in the TVET sector relevant to the 4IR. Thus, a number of PPP conceptual models for vocational education have been presented in the international literature including the Dual Vocational Training System in Germany; the Japanese system; and the Factory School model in Singapore, South Korea, and Malaysia (Oviawe, 2018). These PPP models for skills development require a particular governance structure for the sector.

The ETDP SETA (2021a) presents the partnerships evident in the TVET sector towards achieving pre-determined objectives. The purpose of the partnerships is to combine the partners' skills and resources to achieve win-win outcomes for all partners. Oviawe (2018) noted that throughout Africa TVET private sector partnerships should be encouraged to ensure effective skills development programmes necessary for industrialisation relevant to the local context. This should include partnerships between the workplace and TVET institutions in curriculum development. The objectives of the partnerships should include

making colleges centres of excellence ensuring success in the 4IR. This requires lecturers and managers, through partnerships with stakeholders including universities, the DHET, other colleges, and employer associations, to have the capacity to develop and implement curriculum relevant to the 4IR (ETDP SETA, 2021a).

2.3 Profile of Stakeholders

The National Skills Development Plan (NSDP) 2030 was developed to ensure government and social partners work together "to ensure South Africa has adequate, appropriate and high quality skills that contribute towards economic growth, employment creation and social development" (DHET, 2019a, p5). To achieve the outcomes identified in the NSDP 2030, the 2023/2024 ETD Sector Skills Plan identified the main role players in the TVET sector as universities, SETAs, the Department of Higher Education and Training, South African Public Colleges Organisation (SACPO), South African Council for Educators (SACE), Quality Council of Trade and Occupations (QCTO), Higher Education Quality Committee (HEQC) and Trade unions (ETDP SETA, 2022a). Table 1 presents the main roles players and roles played in the TVET sector. In accordance with the NSDP 2030, the TVET sector role players need to work together to ensure a highly skilled, educated, and capable South African workforce.

Table 1: TVET sector role players and NSDP outcomes

Role Players	Role Played
Department of Higher Education and Training	Development of policies and provision of infrastructure and subsidies for Post-school Education and Training Institutions. Overseer of implementation.
South African College Principals Organization (SACPO)	Promoting best practice in human resources. Improving understanding and capacity for knowledge management. Assisting in curriculum development.
South African Council for Educators (SACE)	To provide for the registration of lecturers; To promote the professional development of lecturers. To set, maintain and protect ethical and professional standards for lecturers.
Trade Unions	Key role players in teacher development and professionalisation of teachers. The mouthpiece of teachers on conditions of work.
Universities	Provide programmes for lecturer development

Role Players	Role Played
SETAs	Facilitate work integrated learning for TVET students and act as a conduit between employers, government and TVET colleges
Quality Council of Trades and Occupations (QCTO) and Higher Education Quality Committee (HEQC)	Oversee the design, implementation, assessment, and certification of occupational and trade-related qualifications. Furthermore, each council offers guidance to skills development providers (private and public) and assessment centres that the QCTO must accredit.

Source: (ETDP SETA, 2022)

2.4 Scope of Programmes and Offered Qualifications

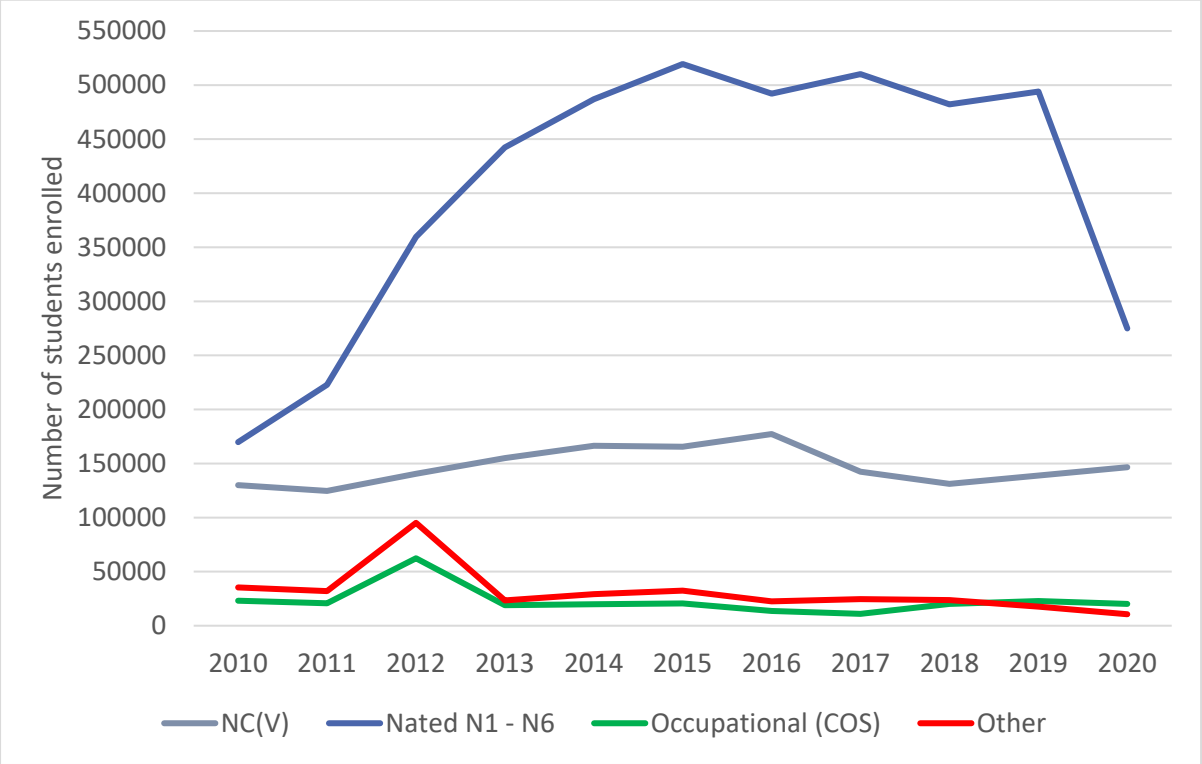
As per the DHET (2022) the following programme types are offered in the TVET subsector:

1. The National Certificate (Vocational) [NC(V)] offered at NQF levels 2, 3 and 4. Nineteen (19) vocational programmes are offered;
2. Report 191 (NATED) programmes offered at level N1 – N6 for Engineering Studies, and N4 – N6 levels for Business and General Studies. The national certificates culminate in a national diploma on completion of the WIL component;
3. The Pre-Vocational Learning Programme (PLP) provides a foundational learning programme aimed at preparing students for access into specific vocational and occupational study path offered at TVET colleges. The PLP aims to address learning gaps which hinder students from academic success;
4. Occupational qualifications include trade offerings offered by centres of specialisation (COS) and other colleges. The programmes are inclusive of a workplace learning component; and
5. Skills programmes include accredited and non-accredited short courses. Courses are based on community and industry needs.

The DHET (2022) presented enrolment statistics by qualification category as noted in Figure 1. It is noted that the largest growth over the 2010 to 2019/2020 period has been in the Report 191 (NATED 1-6) programmes, which consist of the qualifications in Engineering and Business and General Studies. An increase in the number of engineering students is noted as positive for the economy, given that for success in the 4IR/5IR it has been noted knowledge

and skills in the science, technology, engineering and mathematics (STEM) subjects are required (Sutherland, 2020). In 2020, six in every ten students enrolled for Report 191 qualifications (60.8% or 274 907). The November 2021 Technical and Vocational Education and Training Management Information System (TVETMIS) data showed that in 2020 it was the lowest number of total enrolments[1] in eight years (ETDP SETA, 2022a). The 33% decrease noted in 2020 was mainly attributed to the restrictions associated with the COVID-19 pandemic, which resulted in Semester 2 and Trimester 3 being foregone.

Figure 1: Enrolment in TVET Colleges by qualification category, 2010 to 2020



Notes: Students are counted once in every enrolment cycle i.e. annual, semester and trimester. This means that students may be counted more than once a year if they register in every trimester/semester cycle. Other includes other skills programmes, PLP and Level 5 and Level 6 qualification enrolments.

Source: TVETMIS (2020 found in DHET, 2022).

Sibiya et al. (2021) studied TVET students' perceptions on the value of their engineering

[1] The enrollee figure reflects the number of students enrolled in each enrollment cycle of which there are six a year (DHET, 2022b)

qualification in the labour market. The participants highlighted several perceptions. Firstly, that unemployment was rather a function of a lack of jobs than a lack of skills obtained from training. The TVET engineering students did believe the qualification was in demand particularly in the context of the current energy crisis in South Africa. The participants noted that a lack of experience was a barrier to employment, therefore, government funding was recommended to allow students to offer voluntary services in the public and private sector. Funding for students to study beyond their undergraduate qualification was furthermore suggested (Sibiya et al., 2021).

Papier (2021) posits that a lack of practical training and technical and industrial experience limited TVET students' employment prospects. The DHET (2019a) noted the COS[2] were introduced and structured to ensure that the employer is at the centre enhancing the role of social partners towards providing training adequate and relevant to labour market demands, an aim of TVET colleges globally. The approach which South Africa has adopted to training at the COS is referred to as a dual system (based on the Germanic dual system model) and requires strong partnerships between colleges and employers. This ensures learning takes place in both colleges and the workplace to develop the 'Artisan of the 21st Century' (DHET, 2016).

[2] In 2016, the DHET identified 13 priority trade occupations for which the COSs provide training. These included: bricklayer, millwright, electrician, boilermaker, plumber, mechanic (including automotive mechanic), diesel mechanic, welder, carpenter and joiner, rigger, fitter and turner, pipe fitter and mechanical fitter.

3 PRE-COVID-19 STATUS QUO

Rogan (2019) noted that by international standards South Africa's PSET sector has a larger ratio of university to TVET enrolment. In South Africa, the TVET sector has thus received policy attention towards strengthening and expanding the sector (DHET, 2020b). It is however noted the public HEIs receive 75.8% of funding allocated to key PSET institutions compared to 20.7% and 3.5% allocated to TVET and CET colleges respectively. The policy objective is to have 1.25 million students enrolled in the TVET sector by 2030 (DHET, 2019a), an ambitious goal given the 2020 student enrolment figure of 452 277 (ETDP SETA, 2022a). However, considering the enrolment figures in 2010 and 2019 were 358 393 and 673 490 respectively, an increase of 87.92% in enrolment occurred over the nine-year period. If the same increase was to occur over the next 9-year period and beyond the number of enrollees would be predicted as over 1.25 million by 2030. However, considering there was a 33% decrease in enrollment between 2019 and 2020, the target is now more challenging to achieve and requires significant intervention. To achieve the target set of 1.25 million an increase of more than 175% would be required between 2020 and 2030.

3.1 The state of education and training provision before COVID-19

Prior to the COVID-led disruptions of the entire education system in South Africa, the primary mode of teaching and curriculum delivery was conventional or traditional face-to-face instruction. The COVID-19 pandemic, resulted in a full lockdown[3] implemented in South Africa from March 2020, resulting in the closure of TVET colleges and a revised academic calendar (NMMU, 2020). Despite the restricted movements, the TVET sector worked to save the academic year and implemented mitigating strategies including adopting remote learning through online learning and disseminating work packs (Chasingo in TVET College Times, 2020). However, even prior to the pandemic TVET institutions experienced low pass rates and struggled to make the leap to the online world of learning (Papier in NMMU, 2020). The sector was not prepared and willing to adopt a technology-dependant remote learning and

[3] Lockdown is a short-term policy imposed by government officials to restrict physical mobility as well as work/school engagement of individuals in attempts to prevent further spread of the COVID-19.

teaching pedagogy (Papier, 2017). However, despite the lack of adequate ICT infrastructure and lecturers trained in the pedagogies on online learning, the pandemic launched the TVET sector into a world of technology dependent teaching and learning to mitigate learning losses. While some students and lecturers could continue a number could not thus likely to accelerate inequalities in society (Scheepers & Gebhardt, 2021). By May 2020, a survey conducted by the ILO, UNESCO and World Bank revealed that two thirds of the TVET providers surveyed in middle- and upper-income countries were offering fully remote training, while in low-income countries less than 20% of countries were offering fully remote training during the COVID-19 period, where approximately 50% had to cancelled training (ILO - World Bank, 2021).

The TVET sector furthermore has a required WIL programme which within the context of movement restrictions was limited (British Council, 2021). With the return to face-to-face teaching, the importance for institutions and education sectors to ensure sufficient capacity for technology driven teaching methods, for example e-teaching and e-learning[4], to cushion the effects of future disruptions, has been highlighted (Bakare et al., 2020; British Council, 2021). Furthermore, the 4IR requires students to learn a range of skills relevant to the changing technological world in which we live and work. These range from basic computer literacy to computer programming and coding and require a curriculum closely linked to the workplace (Denhere & Moloi, 2021b). Humans are going to be required to collaborate with technology in the 4IR/5IR and the TVET curriculum needs to develop graduates who engage in lifelong learning and the ability to acquire just-in-time skill sets (ETDP SETA, 2022a).

The nexus between the skills needed for the 4IR and technology-based education has highlighted the need for TVET institutions to build e-learning capacity (Bakare et al., 2020). It is thus evident that the way of operating clearly changed in the TVET sector throughout 2020 with 71% of participants highlighting that COVID-19 had, to a high degree, changed the way

[4] "The term eLearning has many interpretations and can involve face-to-face as well as remote interactions, therefore eLearning might more generally be considered to be the use of technology to support and enhance learning. While eLearning enhances the learning experience for students by offering improved electronic resources, eTeaching employs the same resources in order to enhance the teaching experience" (Uren & Uren, 2009).

the institution operated.

3.2 Skills and occupational shortcomings in the TVET sector

The TVET sector is noted as having a shortage of professionally trained lecturers, particularly considering the digitisation of the economy as a response to the COVID-19 pandemic and the skills required for the 4IR (Bakare et al., 2020; British Council, 2021). Well-trained and equipped lecturers would have the ability to adapt curriculum and pedagogy as required to address emerging skills needs. Evidence of the skills and occupational shortcomings is discussed next, followed by the development priorities in the TVET sector, considering the COVID-19 pandemic and the challenges and opportunities that accompany the 4IR.

The ETD Sector Skills Plan 2023 – 2024 (ETDP SETA, 2022a) noted that at the start of the COVID-19 pandemic, only 20% of TVET lecturers were equipped to teach using online platforms. Investigating the current status of the TVET sector to produce sustainable skills, Makgato (2019, p. 19) unfortunately found that in South Africa, "the vocational pedagogy and practical skills training is not responding to workplaces, and lead to high unemployment of youth". It was however acknowledged that the study's findings were not generic and additional research was required.

Denhere & Moloi (2021a) studied the readiness of the TVET sector in South Africa to train students for the 4IR and it was noted that insufficient teaching and learning technologies and staff training on how to use the available technology, a lack of ICT infrastructure and strategies, poor connectivity and a lack of policy directive are reasons why the TVET sector is not completely ready. Considering low- and middle-income countries, Bakare et al. (2020) highlighted that numerous studies have identified TVET lecturers do not possess sufficient digital literacy. It is thus evident that a lack of online teaching skills is not only a problem in South Africa but extends globally. Thus, to produce graduates with the skills needed for the workplace, the capacity for remote online programmes needs to be built. This would be facilitated by means of employing education technology (EdTech) and electronic learning (e-learning) platforms.

Aina and Ogegbo (2022), in a study of TVET lecturers and factors which impact the transition to online teaching, identified that "challenges such as lack of support on the integration of technology into their practice, access to connectivity, provision of little or no training on pedagogical practices, unconducive home environment, students' attitudes in the online space, lack of infrastructure and poor policy guidelines and framework for implementing virtual learning pose a threat to educators' desires to change and support a transition to virtual learning permanently" (Aina & Ogegbo, 2022, p129). It is thus suggested that adequate support and training is needed for lecturers to foster pedagogical practises needed for online teaching. An additional limitation of moving TVET students to a virtual classroom was recognised by lecturers as the inability of students to work independently and given courses in the TVET sector include a practical component (Papier, 2021).

3.3 Funding

The education sector in South Africa is crucial for inclusive economic growth and thus recognised as a priority area for the government. Thus, an increasing proportion of the fiscus has been allocated to education as a percentage of GDP as specified in the Medium-Term Expenditure Framework (MTEF) period 2018 - 2020 (ETDP SETA, 2022b). However, Matiso (in NMMU, 2020) identified that the TVET sector is underfunded and although additional resources are needed so are effective governance and management skills to use the funds appropriately. COVID-19 has furthermore put pressure on most countries' fisci, with funds required for the health sector and to ensure economic recovery of vulnerable sectors and citizens (Bakare et al., 2020). The loss of household income has further resulted in a reduction in tuition fee revenue, which is used to supplement revenue from government subsidies in the education sector.

In South Africa, however the expenditure on the post-school education and training was between 1.5 – 2% of GDP between 2017/2018 and 2023/2024, of which the TVET sector received 20.7% in 2022/2021 of the funding of key PSET institutes (Bakare et al., 2020; DHET, 2022). In comparison, funding in East- Asia and Pacific countries was overall on 1 – 2% of GDP for the TVET sector (Palmer, 2017). It is evident that by international standards the TVET sector in South Africa is underfunded and too small for the level of development in the

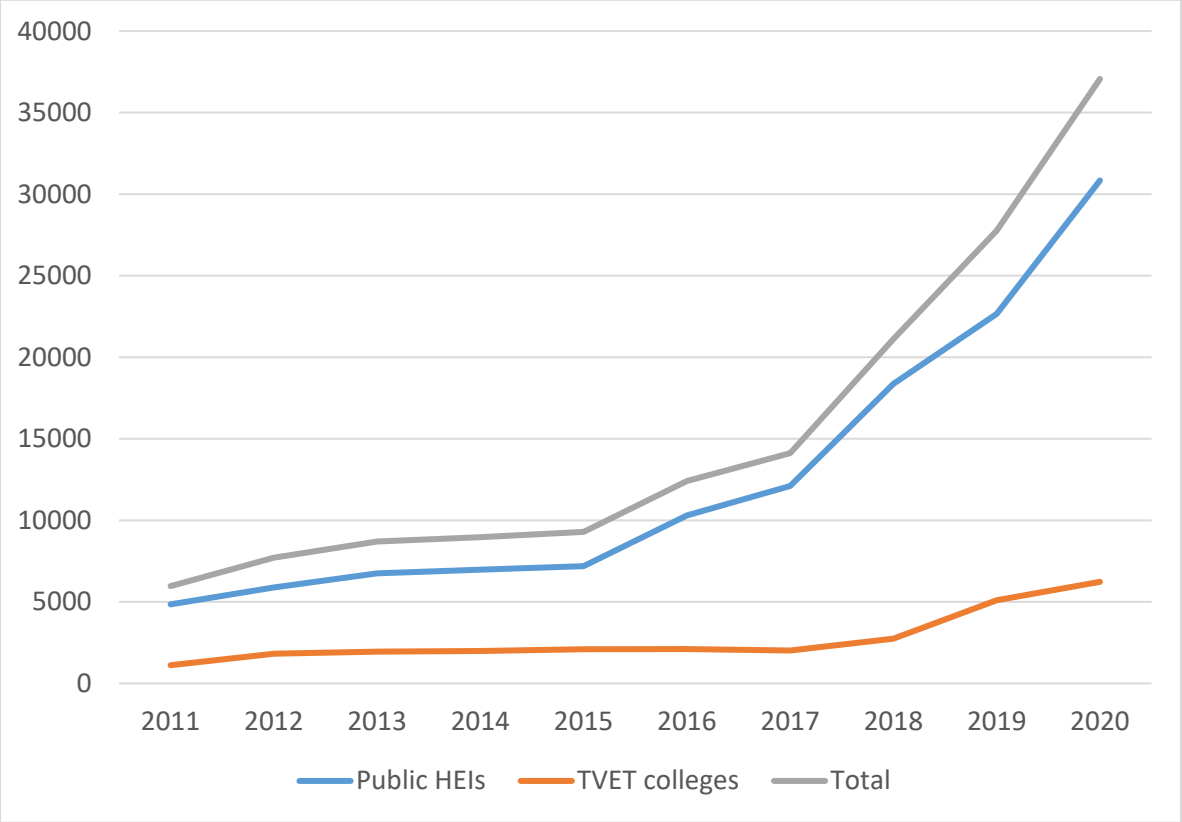
economy. Considering the education budget, the schooling sectors receives 84%, Universities 11% and TVET colleges 4% (World Bank, 2022). General education expenditure thus far surpasses vocational education expenditure. DHET (2019a) thus concludes that the TVET sector is underfunded.

A study by Doner and Schneider (2019) countries presented how countries divide resources between vocational and general education considering expenditure as a percentage of GDP. It was identified that the Scandinavian and European countries (for example Finland and the Netherlands) spend a greater proportion on vocational education in comparison to general education. However, middle-income Organisation for Economic Co-operation and Development (OECD) countries (for example Chile, Mexico and Turkey) spend a greater proportion on general education (Doner & Schneider, 2019).

Funding for public TVET colleges in South Africa comes from three primary sources namely government funding, NSFAS and donor funding, which may include SETAs, and donor-agencies, including the National Skills Fund (NSF). TVET colleges received funds for operation costs as well as subsidies. In 2020/2021, funds allocated to TVET colleges was allocated 54.8% for operation costs, whilst 45.2% for subsidies (DHET, 2022).

Figure 2 indicates the amount of NSFAS loans paid by PSET subsector over the time period 2011 – 2020. It is evident that public HEIs received the largest portion of loans being 83.2%. This is however only for 65.9% of the total number of students benefiting from NSFAS loans/bursaries. There was a large increase in the value of bursaries between 2018 and 2020 in the TVET sector from 2.7 billion in 2018 to 6.3 billion in 2020. In 2020, the TVET sector received 16.8% of NSFAS loan/bursaries (for 34.1% of the total number of students benefitting). NSFAS allocated R37.1 billion for student funding during 2020 – R9.3 billion (33.5%) higher than what was allocated in 2019 (R27.8 billion) (DHET, 2022).

Figure 2: NSFAS loan/bursaries paid by PSET sector (in millions), 2011 – 2020



Source: Statistics on PSET in South Africa, 2019 found in DHET (2022).

3.4 Staffing

3.4.1 Staffing figures and demographics

The ETDP SETA (2022) estimated 20 375 individuals employed in TVET colleges in 2019. Approximately 56% of staff are academic staff, 42% support staff and 2% management staff. While it is unclear whether this is an ideal ratio of not it is evident that the hard to fill vacancies were dominated at the Professional level of educator particularly those specialised in engineering and technology. Table 2 illustrates the top 11 occupation categories in the TVET sector by gender. It is evident that females dominate every occupation except for Faculty Head and to a lesser extended Training and Development Professional.

Table 2: Top 11 Occupations in TVET Colleges according to gender.

Occupations	Male	Female	Total
TVET Educator	4123	4573	**8 696**
General Clerk	539	1191	**1 730**
Caretaker / cleaner	713	954	**1 667**
Office Administrator	250	434	**684**
Employee Wellness Practitioner	229	297	**526**
Human Resource Advisor	173	264	**437**
Computer Operator	136	150	**286**
Faculty Head	153	127	**280**
Training & Development Professional	132	126	**258**
Human Resources Clerk	37	121	**158**
Accounts Clerk	30	103	**133**

Source: ETDP SETA (2022)

The numbers presented in Table 2 were estimated using annual reports of 26 public TVETs. In the TVET sector women are slightly more represented when considering academic staff (58%), while in other public HEIs men are slightly more represented (52%) (ETDP SETA, 2022a). Considering the age breakdown of employees, 66% of employees are between the ages of 35-55 and 24% less than 35 years old. The ideal of having a few staff over 55 is thus evident in the TVET sector with 11% of staff over 55. A younger labour force in the TVET sector means that the much-needed upskilling and professionalisation of lecturers is a viable and sustainable option.

3.4.2 Staff qualifications and skills levels

The TVET sector experiences a shortage of trained lecturers and a lack of sufficiently customised training programmes. Table 3 presents the status of lecturer qualifications in 2018 as illustrated by Sethusha (2020) highlighting that only 4.8% of lecturers are sufficiently academically and professionally qualified at TVET colleges lecturers. To fill this gap, the WPPSET established the South African Institute for Vocational and Continuing Education and Training (SAIVCET) to upgrade the technical knowledge and pedagogical skills of existing staff, and promote the professionalization of TVET instructors, trainers and lecturers. Furthermore, Continuing Professional Development (CPD) initiatives targeted at TVET lecturers have been developed. In 2021, three specialised programmes were offered with more in the process of being developed. Fourteen (14) universities were tasked with developing professional TVET

lecturer qualifications with UWC being the first university to get its PGDip TVET accredited in 2015 and rolled out in 2017. A range of new indicators have been added to the DHET Annual Performance Plan over the past couple of years. These include indicators of TVET courses aligned with 4IR skills, lecturers involved in digital literacy programmes and number of TVET students placed in workplaces (DHET, 2022). From the performance results presented by the DHET (2023a) indicated that in 2021/2022 there were no colleges offering courses aligned with 4IR skills, however the target was that by 2024/25 all 50 colleges would be. Furthermore, with regards to lecturers participating in digital literacy programmes, the actual value in 2021/2022 was 651 lecturers with a target of 6500 lecturers by 2025/2026. The estimated performance for the number of work placements for TVET students is presented as 10 000 for 2022/2023. The 2022/2023 estimated results are however yet to be confirmed. The target for 2023/2024 is 20 000 placements and therefore the aim is to double the number of placements compared to the previous year.

Table 3: Lecturer qualification category in the TVET sector, 2018.

Category	Estimated percentage (DHET 2018)
Unqualified and undefined lecturers	25.8%
Academically qualified but professionally unqualified lecturers	36.3%
Academically qualified and professionally qualified, but for the schooling sector.	33.1%
Academically and professionally qualified as a college lecturer	4.8%

Source: Sethusha (2020)

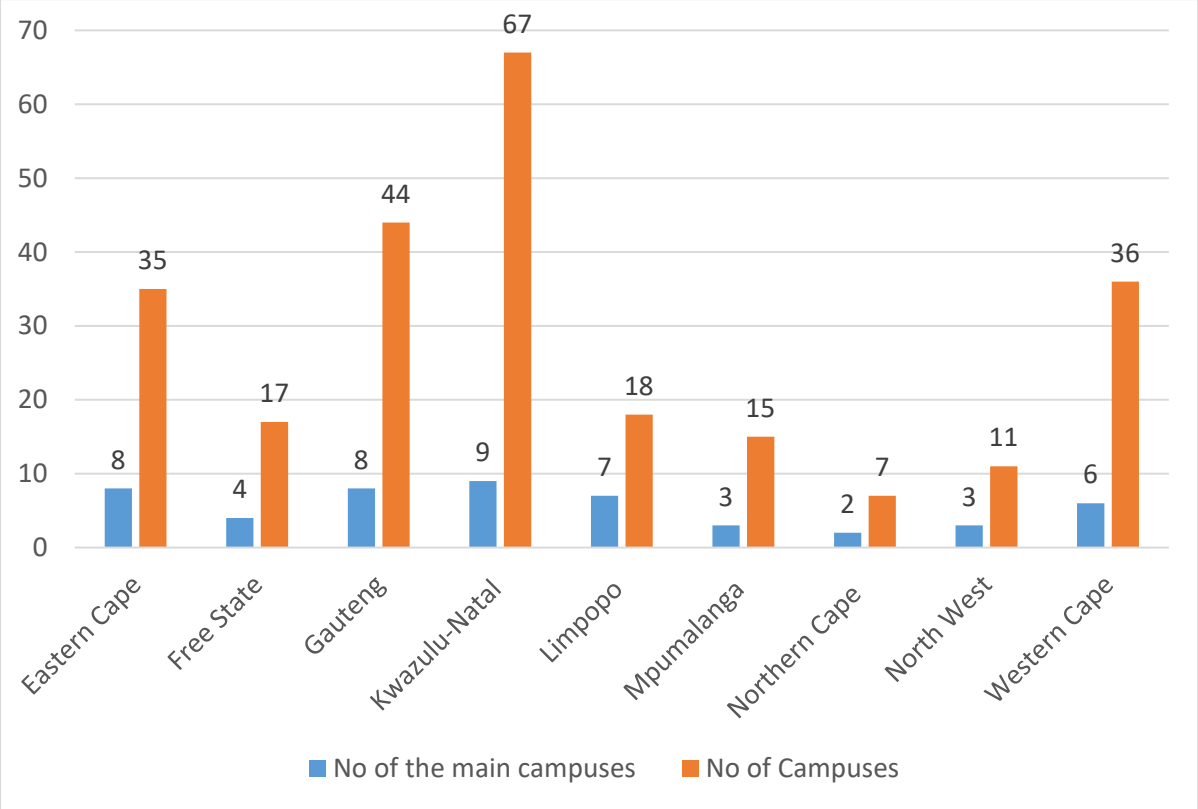
It is noted that 60% (in 2019/2020) and 59% (2020/2021) of TVET college lecturers had professional qualification. The need to upskill and reskill lecturers is thus re-emphasised to improve performance in the TVET sector but also to remain relevant in the 4IR (Denhere & Moloi, 2021a).

3.5 Enrolments

The TVET sector had 673 490 students enrolled in 2019, 452 277 in 2020 and 589 083 in 2021 (ETDP SETA, 2022a). The largest number of campuses are found in KwaZulu-Natal (as presented in Figure 3), with 67 campuses, and the highest number of students are in the

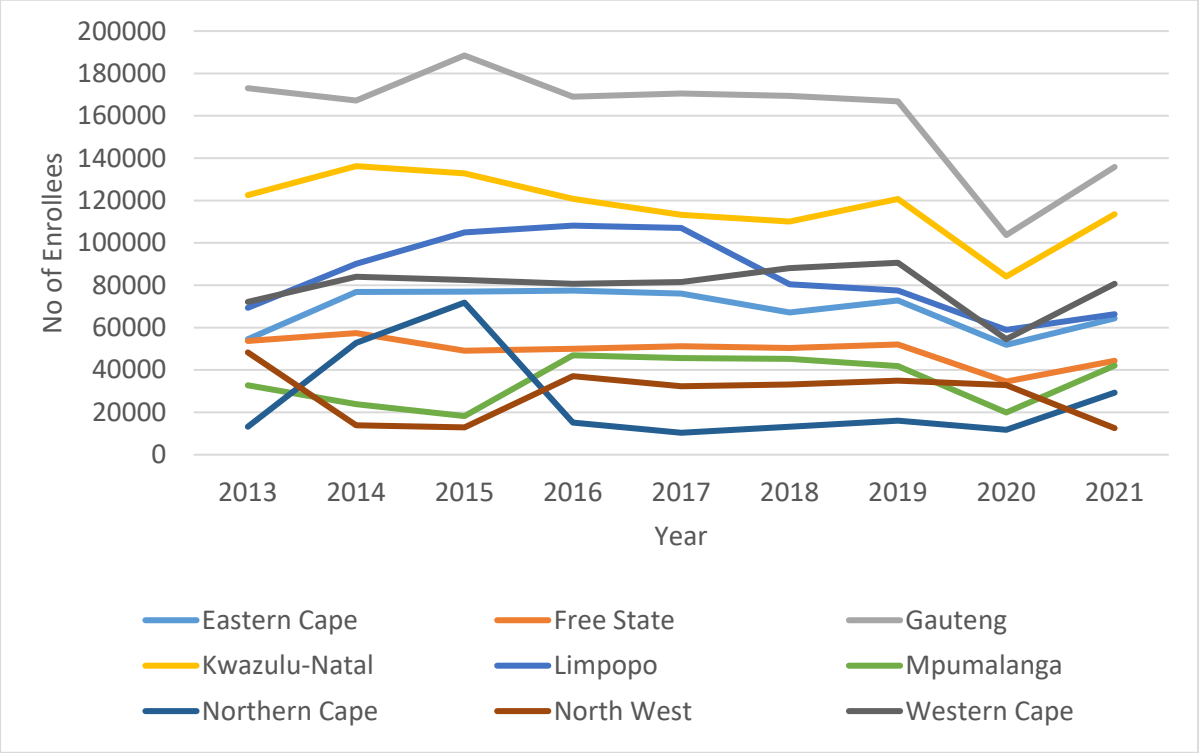
Gauteng province (as presented in Figure 4), with 135 844 students enrolled in 2021, followed by KwaZulu-Natal with 113 571 students. In 2021, the province with the least number of colleges and campuses was the Northern Cape and the lowest number of enrollees was the North West. Figure 4 confirms the reduction in the number of enrollees in 2020 in all provinces, except for the North West where enrolment figures remained steady but thereafter decreased between 2020 and 2021.

Figure 3: Number of Public TVET colleges and campuses in South Africa, by province



Source: (ETDP SETA, 2022a)

Figure 4: Number of enrollees in Public TVET in South Africa, by province



Source: Authors' own construction (DHET, 2015, 2016, 2017, 2018, 2019d, 2020c, 2023b)

3.6 Throughput and employment outcomes.

Papier (2021) noted that TVET policies in South Africa continue to be focused on quality improvements, however since the introduction of the NC(V) curriculum, in 2007, pass rates have only increased slowly with many students dropping out and not completing their qualifications, as per the Annual Performance Statistics provided by the DHET (2022). The yearly performance targets are furthermore mostly not met amid the pressure of the TVET sector to educate and train youth who require skills to enter the labour force (Papier, 2021). The reasons for poor performance are multi-faceted with professionally trained educators noted as key to improving performance (Scheepers & Gebhardt, 2021).

The DHET (2022) presented the throughput rates of TVET NC(V) students pre- and post-COVID- 19 as 53.9%, 31.8%, and 46.8% in 2018/2019, 2019/2020 and 2020/2021 respectively. Despite, throughput being low for the study period (2018/2021), it was further reduced when the shift to remote online learning occurred, 2019/2020. Recovery did, however, occur in

2020/2021.

A Tracer study commissioned by the DHET (2020a) identified that employment[5] outcomes for TVET completers are disappointing and below 50%. This is furthermore below the labour market absorption rates of qualified artisans which is 79%. However, despite concerningly low labour market employment rates, the Tracer study identified that TVET completers are in a better position to find employment in the South African labour market than their counterparts with a broad unemployment rate of 52.2% for TVET completers compared to 67.4% for other youth (age 16 to 24 years old) without a tertiary education.[6] In contrast HEI graduates in the same age group are estimated by StatsSA (2019; 2022) to have an unemployment rate of 31% in 2019 and 32.6% in 2022, thus notably lower than non-graduate youth. The unemployment rate of all working age graduates was an estimated 7% in 2017, thus lower than the youth unemployment rate of graduates (Statistics South Africa, 2018). The Tracer study furthermore identified that it is the level of TVET qualification which is a strong predictor of the risk of unemployment rather than programme type (DHET, 2020a). Thus, it was highlighted that the quality of the N6 programmes need to ensure TVET graduates are competitive to completers of other types of qualifications at public colleges. However, identifying specific programmes that supply scarce skills in the context of the 4IR/5IR would equip TVET completers with the skills demanded in the labour market to grow the South African economy.

It is against this backdrop of poor student performance, low youth labour absorption rates, lecturers with insufficient digital literacy, a lack of ICT infrastructure and inequalities in the labour market, to name a few, that the COVID-19 pandemic hit the TVET sector. Furthermore, the COVID-19 pandemic brought to light the need for 4IR readiness to improve performance of the TVET sector, requiring students to achieve skills relevant to the changing technological world in which we live and work (Makgato, 2019).

[5] The absorption rates for completers in workplace-based Learning (WBL) programmes, self-employment and employment combined is 40% (DHET, 2020a).

[6] The broad unemployment rate includes the population without employment regardless of whether they are or are not currently searching.

4 POST COVID STATUS QUO

4.1 The state of the subsector post covid: emerging trends

The ripple effect of the pandemic has led to numerous changes in organisational and educational structures. This objective seeks to capture these changes in staffing, teaching methodologies, or curricular content. The intent is to document how the ETD sectors have adapted and evolved in response to the crisis.

The emerging trend firstly discussed the digitalisation of the TVET sector. This includes a discussion on the impact of COVID-19 on digital and/or remote learning, teaching and working (British Council, 2021); the need to professionalise and capacitate TVET lecturers (British Council, 2021; Papier, 2021); and the importance of revising the curricula towards meeting the demands of the 4IR and ensuring sustainable employability (Nzimande, in TVET College Times, 2020). Furthermore, in accordance with the ETDP SETA (2022), the emergence of hard-to-fill vacancies, critical and scarce skills and emerging partnerships are highlighted.

4.1.1 COVID-19 and the Digital Transformation

The British Council (2021) studied how the COVID-19 pandemic resulted in TVET colleges innovating, evolving and changing across five countries in the British Council's I-WORK[7] programme (namely South Africa, Ghana, Malaysia, India and the UK). It was identified that several new opportunities have resulted from adopting digital learning and teaching, for example, beyond using technology to conduct e-learning, it can be used to increase accessibility through remote work placements (British Council, 2021). This would be particularly beneficial in South Africa where work placements are required for the WIL component of the courses. In addition, digital transformation has led to a change in the skills needed for work and life in the 4IR. Unfortunately, pre-existing challenges remained a factor

[7] The British Council implemented the I-WORK programme (Improving Work Opportunities -Relaying Knowledge) over a three-year period, 2018 – 2020, aimed at enhancing the TVET sector towards creating better opportunities for students to gain employment. It was focused on five Commonwealth countries namely Ghana, India, Malaysia, South Africa and the UK and was funded by the UK government (British Council, 2021).

which limited the potential of the TVET sector to digitally transform and could thus further education inequalities (British Council, 2021).

A potential limitation is the implication that academic staff in TVET colleges do not have the skills and facilities necessary to succeed in an e-learning environment (British Council, 2021). Beyond the requirement of appropriate ICTs, the competence and experience of lecturers determines the quality of graduates. It has thus emerged that lectures need to be ready for a world of e-learning which requires lecturers to be sufficiently digital literate and have the ability to design or redesign and offer programs for online learning. To capacitate TVET lecturers, the SETA has developed the Future Skills Focus programmes which are "Digital Citizenship, Digital Literacy and Digital Fluency 12-month short learning programmes at the NQF Level 6-7" (ETDP SETA, 2022a).

Modernising study programmes to reach students in different locations, e-teaching has been prevalent in developed countries, however, it has been less prevalent in low- and medium-income countries given a shortage in the skills and infrastructure required to be effective. These shortages are particularly evident In the South African TVET sector. Bakare et al. (2020, p. 191) identified that the "e-teaching platform is the secret behind most of the greatest universities in the world that graduate successful and informing people".

The TVET sector has furthermore recognised the importance of revising the curricula towards meeting the demands of the 4IR and ensuring labour market absorption towards a sustainable future. In 2018 this involved the revision of 38 courses with 14 of the curricula adjustments implemented from January 2021 (Nzimande, in TVET College Times, 2020). Students need to be taught to use technologies which include AI, cloud computing, robotics, 3D printing and advanced wireless technologies. Furthermore, TVET colleges need to produce critical thinking and problem solving innovators who are able to adapt in the context of technological disruptions (Denhere & Moloi, 2021a).

4.1.2 Development priorities in response to COVID-19 and 4IR

The 4IR requires students to be innovative and therefore trained in science, technology, engineering and mathematics (STEM) (Makgato, 2019), requiring the development of lecturers in these fields to be prioritised. Without these skills students are vulnerable to unemployment or employment in low skilled positions. To achieve suitably trained students for the 'digital revolution' it was furthermore suggested that reskilling and upskilling of TVET college lecturers is required to keep abreast of the latest technological development as well as integrating the theory taught with practical skills needed in the workplace (Denhere & Moloi, 2021a; Makgato, 2019). The ICT infrastructure for lecturers to be successful is thus of priority. Papier (2020 in NMMU, 2020) furthermore noted that curricula should be re-examined for 21st century education. The four dimensions which were suggested as curriculum development priorities included: knowledge, skills, character and better learning.

The British Council (2021), who researched how TVET institutions in five countries are innovating and evolving because of COVID-19, identified that almost half (46%) the lecturers believed that access to available technology was greatly affecting their ability to offer online training. The access and ability to use the required technology was however specific to different institutions, thus although a total of 46% is recorded, in some institutions 100% of lecturers may believe access to technology was a challenge. Furthermore, even if teachers had access to technology there was a lack of skills and confidence to use the technology needed to offer online learning effectively. The abrupt shift to online learning because of COVID-19 meant that there was insufficient time to ensure teachers were sufficiently trained for remote online learning in terms of teaching pedagogies and skills required to effectively use technology (British Council, 2021; Papier, 2021). This training is a skills development priority to reduce the vulnerability of the sector to future learning disruptions (Bakare et al., 2020) and equip students with the skills required to be relevant in the 4IR (Denhere & Moloi, 2021a).

It is thus evident that a new cohort of professional training lecturers and upgrading existing TVET lecturers is required within the pedagogy of developing '21st century competencies', which requires the development of skills such as self-directed learning, problem-solving,

strong interpersonal skills and digital literacy (Papier, 2021). ICT infrastructure is required to support this development. Furthermore, Matiso (in NMMU, 2020) identified a need for additional management skills in the sector, which is important for strategic management and managing funding effectively.

Denhere & Moloi (2021b) studied the perceived technological skills requirements of students to operate successfully in the 4IR by interviewing SRC members from 26 of the 50 TVET colleges in South Africa. Ninety-three percentage of respondents were not satisfied that the current curriculum in TVET colleges provided them with the relevant skills needed for employment in the 4IR. It was highlighted that the current course content was not aligned with current industrial and technological requirements. To improve students' technological skills, it was highlighted that more work-based exposure (ensuring a practical orientated curriculum) was required as well as compute skills training. Basic computer literacy, understanding computer hardware, speed typing and competency in Microsoft Office programmes including PowerPoint/Excel/Word were noted by respondents as the skills required by students to participate meaningfully in learning.

4.1.3 Skills shortages

The ETDP SETA (2022) reported that a primary reason associated with Hard-to-Fill Vacancies in the TVET sector is applicants' lack of relevant skills. The concern with hard-to-fill vacancies in the TVET sector is not exclusively an emerging issue but rather is being entrenched over time. Throughout the broader ETD factor skills shortages are evident mainly in the areas of mathematics, sciences, languages, and technology. Table 4 presents the skills gaps related to the TVET sector in 2022. The reasons for the vacancies being hard to fill include that the TVET Educator position is perceived as poorly remunerated and because of a lack of potential employees with relevant qualifications and experience. The need for lecturers who possess the required digital capacity and in the STEM subjects, to ensure students are trained with the skills for the 4IR, is expected to emerge further (ETDP SETA, 2023).

Table 4: Skills gaps in the TVET subsector, 2022

MAJOR GROUP	OFO CODES AND OCCUPATIONS	SKILLS GAPS
Managers	2021-134503 Faculty Head	Educational Management, Leadership
Technicians and Associate Professionals	2021-334302 Personal Assistant	Minute taking, Social Skills, Written communication, Emotional Intelligence Skills
	2021-334102 Office Administrator	Technical Skills, Project Management Skills, Excel Skills, Communication, Service Delivery/Customer Orientation
Professional	2021-231101 University Lecturer	Digital Skills, Facilitation, Design and Development of Learning Material Skills, Editing Skills, Leadership skills al Clerk
	2021-232130 TVET Educator	Facilitator, Computer Literacy, Technical Skills, Digital literacy and 4IR
Clerical Support Workers	2021-411101 General Clerk	Advanced Excel, Customer services, Presentation Skills

Source: ETDP SETA (2022)

4.1.4 Partnerships

Building partnerships with other public universities in South Africa have been underway to develop qualifications needed to ensure professional TVET lecturers, through formal university-based training. Table 5 presents the programmes for TVET lecturers recently approved by the College Lecturers Programme Evaluation Committee (COPEC) and on offer in HEIs in South Africa (ETDP SETA, 2022a). The aim is to address knowledge and skills gaps specifically within the areas of ICT and digital skills towards improving TVET lecturer capacity to align curricular and classroom practices towards ensuring TVET colleges develop graduates with the skills to shift SA economy to knowledge economy (Sethusha, 2020). The South African Public Colleges Organisation (SAPCO) has collaborated with institutions including Huawei, Chinese Culture and International Education Exchange Center, British Council and Vastratech to improve lecturer training aligned with the digitalisation and 4IR skills (Sethusha, 2020b). Furthermore, the DHET has partnered with CISCO Network Academy (CISCO is an IT and Networking company), to align the TVET sector with 4IR developments by keeping up with changing development in technology (UNESCO, 2021).

Table 5: TVET Programmes recently approved by College Lecturers Programme Evaluation Committee (COPEC), 2013 - 2021

Programme	Institution
Advanced Diploma in Technical and Vocational Teaching	Cape Peninsula University of Technology, Central University of Technology, Durban University of Technology, Nelson Mandela University, Tshwane University of Technology, University of Johannesburg, University of KwaZulul-Natal, University of Pretoria, WITS, Vaal University of Technology, Walter Sisulu University, Damelin, Stadio, and UNISA
Diploma in Technical and Vocational Teaching	Cape Peninsula University of Technology and University of the Free State
Bachelor of education in Technical and Vocational Teaching	Tshwane University of Technology
Postgraduate Diploma in Technical and Vocational Teaching and Training (Curriculum Leadership)	University of Pretoria
Postgraduate Diploma in TVET	University of the Western Cape
Doctor of Philosophy in Postgraduate Diploma in Technical and Vocational Teaching and Training	University of the Western Cape
Advanced Diploma in Technical and Vocational Teaching and Training	Regent
Master of Education in Technical and Vocational Teaching and Training	University of the Western Cape

Source: ETDP SETA (2022, p46)

The need for a partnership between TVET institutions and with industry partners is being further entrenched given the WIL component included in the Report 191 (NATED) programmes (Scheepers & Gebhardt, 2021). The WIL component forms an important part of the TVET training giving students the opportunity to gain the appropriate knowledge, skills and attitudes required to ensure successful adjustment to the workplace.

5 IMPACT OF COVID-19 ON TVET SUBSECTOR

In South Africa in 2020, the TVET sector closed for semester 2 and semester 3. Unclear on when campuses might reopen, colleges had to plan for student return and working in a restricted environment. A further challenge was that of creating a safe environment for students and staff. Thus, the DHET and Department of Health aimed to ensure that at an operational level, campuses were safe by ensuring basic safety was in place (NMMU, 2020). A balancing act between securing sufficient basic needs and the ability to progress cognitively ensued (Papier, 2021). By the end of July 2020 all TVET college students were back on campus however with several restrictions in place to ensure social-distancing and thus curb the spread of COVID-19.

Anticipated impacts of the COVID-19 pandemic on the TVET sector include: increasing inequality due to variances in access to ICT, poor skills development due to limited WIL participation, learning losses as a result of college closures and the prioritisation of the digital transformation of the sector. Each are discussed below starting with the new ways of teaching and learning which were required to mitigate continued disruptions from the COVID-19 pandemic and ensure continued operations.

5.1 A new way of teaching and learning

A blended[8] and multimodal learning[9] model was adopted on some campuses to limit teaching and learning losses which were potential side effects of disruptions caused by the COVID-19 pandemic (Chasingo, in TVET College Times, 2020). Scheepers & Gebhardt (2021) identified that although lecturers and learners were willing and motivated to teach and learn, despite the challenges presented by the COVID-19 pandemic, a lack of equitable access to resources for online and decentralised teaching and learning hindered the ability of the TVET sector to progress. Successful implementation of the blended learning model was by the False Bay TVET

[8] "Bended learning combines traditional classroom-based teaching styles with digital learning tools" (Aston Carter, 2021).

[9] "Multimodal learning leverages a variety of resources that appeal to different learning preferences" (Aston Carter, 2021).

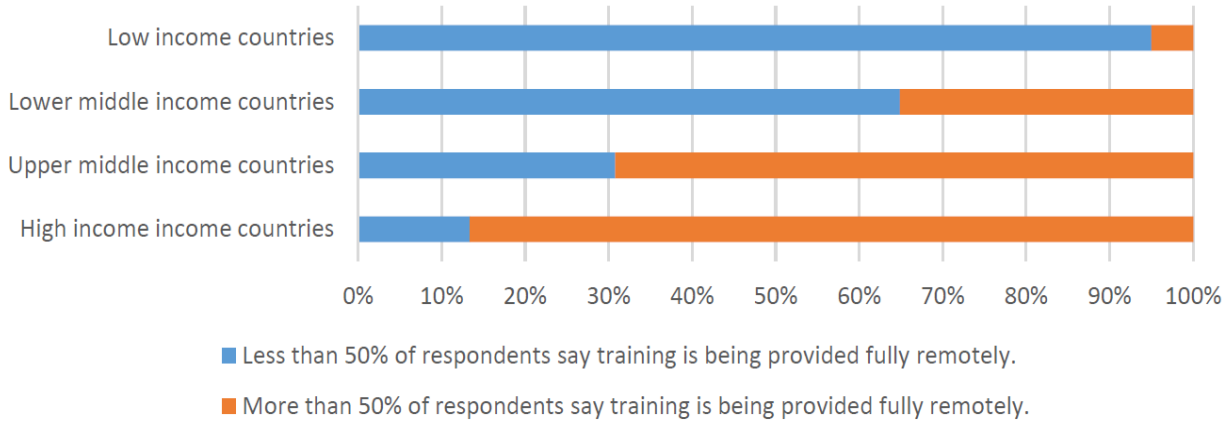
college, which prior to the pandemic had heavily invested in blended learning (NMMU, 2020). However, without all colleges prepared and invested in multimodal learning models some were left behind.

A challenge experience by many TVET students during the remote learning context included limited access to learning resources including textbooks, laptops, data, connectivity, frequent power interruptions and were subjected to unconducive remote workspaces to name a few (NMMU, 2020). Papier (2021) thus identified that lecturers believed remote learning would have negative impacts on the potential for students to succeed academically.

Lecturers experienced similar challenges with the sudden movement to remote online teaching (Papier, in NMMU, 2020). Home environments were not always conducive to engaging with students remotely. Where institutions did not have funds to provide the required resources to teach online (for example the necessary data and devices) lecturers had to fund this themselves placing financial strain on lecturers who were already strained given the reality of living in the COVID-19 pandemic. The expected impact was thus learning losses and increases in education inequalities.

The ILO-UNESCO-WBG (2020) conducted a joint survey on TVET skills development during COVID-19 by considering different regional impacts. Respondents were from 126 countries, totalling 1 349 responses by 15 May 2020. The study revealed that educational inequalities were expected to increase with the onset of the COVID-19 pandemic. Reasons included that remote online learning, required to continue the academic programme, was adopted disproportionally more by high-income countries, and high-income households, as is evident in Figure 5 (ILO-UNESCO-WBG, 2020).

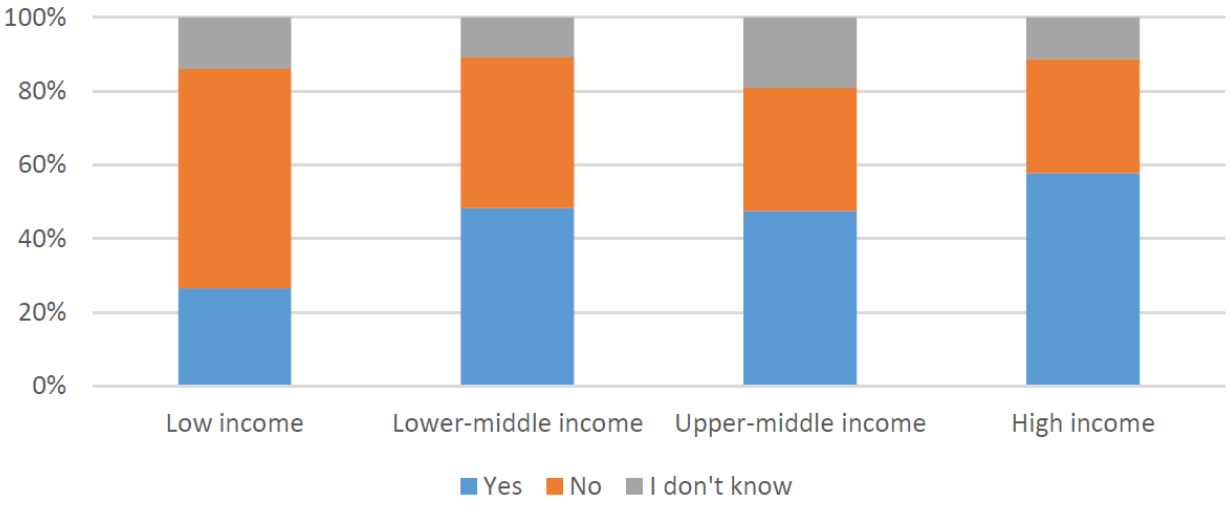
Figure 5: Provision of fully remote training courses by countries' income level



Note: High income (30 countries); Upper middle income (39 countries); Lower middle income (37 countries); Low-income countries (20 countries).
Source: ILO-UNESCO-WBG (2020)

The majority of respondents who reported providing training fully remotely in high-income countries was 87%, in comparison to low-income countries who reported the same outcomes for 5% (ILO-UNESCO-WBG, 2020). The likelihood of TVET institutions allocating additional resources to remote learning was also correlated by countries' income level as illustrated in Figure 6 (ILO-UNESCO-WBG, 2020).

Figure 6: Additional resources committed for the use of distance learning, by countries' income level



Note: High income (71 respondents); Upper middle income (880 respondents); Lower middle income (318 respondents); Low income countries (80 respondents).
Source: ILO-UNESCO-WBG (2020).

The main findings and challenges identified in the ILO-UNESCO-WBG (2020) study, experienced by TVET training providers, included those providers who, prior to COVID-19 did not have infrastructure for e-learning, could not easily transfer to distant learning during COVID-19. Furthermore, vulnerable population groups, for example poor and rural population groups, required additional resources and support when moving to e-learning. A lack of internet and electricity were problems repeatedly mentioned as challenges to remote learning, which was exacerbated in rural areas. Allias (in NMMU, 2020) noted that the TVET sector serves many of the poorest students in the post-school sector and thus remote learning particularly challenging. Infrastructure inequalities thus deepened education and training inequalities internationally as well as within countries. The social contexts which lecturers and learners lived in furthermore impacted the ability to move to remote learning. For example, women experienced increased family responsibility, thus negatively impacting the capacity for remote learning. The family-work balance became more difficult to navigate. Potential advantages of remote learning however included flexibility, increased accessibility to teaching material and being able to learn in the comfort of your own home (Mukhtar et al., 2020). Students from rural areas were found to have additional connectivity and technological challenges. Papier (2020 in NMMU, 2020) thus argued that students struggled to effectively study at home given basic level challenges experienced during the COVID-19 pandemic for example reduced family incomes, deaths and factors which meant that home environments were not conducive to studying for some, resulting in learning losses.

The WIL component of the TVET programmes was furthermore negatively impacted, given the dramatic effects of COVID-19 on the economy and labour market (UNESCO, 2022). Consequently, work placements were limited (Magingxa, in NMMU, 2020) and thus students who could not find placements could not complete the WIL component of the programme and graduate with the National Diploma. Furthermore, students were not gaining the knowledge and skill benefits that the WIL component aimed to achieve (Magingxa, in NMMU, 2020). Transition to the labour market was therefore delayed and negatively impacted.

A number of new opportunities have however arisen because of the forced movement to an increase in the use of technology in learning within the TVET sector. This includes recognising a new way of doing things relevant to the 4IR which requires the development of skills such

as self-directed learning, problem-solving, strong interpersonal skills and digital literacy (Papier, 2021). Constantly evolving 21st century industries which experience rapid technological advances requires the PSET sectors to develop critical thinkers, problem solvers, and adaptable innovators.

6 COPING AND ADAPTATION STRATEGIES WITHIN COVID-19

Post-pandemic recovery is a concern for every sector, and ETD is no exception. It is essential not only for immediate recovery but also for ensuring long-term resilience against future disruptions. In this section strategies and approaches that the ETD subsectors are adopting to ensure they uphold and fulfil their mandates in a post-COVID-19 scenario are reviewed.

Following COVID-19, the ETD sector has recognised the need to build resilience in the different ETD sub-sectors and secure the required infrastructure to be effective in the 4IR.

6.1 Resilience

- Bakare et al. (2020) identified that the TVET sector has recognised the importance of building capacity for e-learning to efficiently improve academic and workplace skills of both lecturers and students. Academics however need to be upskilled to be able to incorporate e-learning in to TVET curricula. This would reduce the vulnerability of the sector to similar disasters.
- Partnerships have been formed towards building resilience, employability, and ensuring a digital transformation of the TVET sector (Sethusha, 2020). This includes the DHET's (2022) commitment to ensure 10 000 unemployed TVET students are offered work placements.
- The shifting demands of the labour market and society in the 4IR will require individuals who are lifelong learners who keep their skills up to date. UNESCO (2022, p. 14) thus stated that the TVET sector must "offer lifelong learning opportunities for both women and men, with individualized and adaptative pedagogies, flexible learning modalities, pathways across types of education and training and across activity sectors, recognition, validation, and accreditation (RVA) of non-formal and informal learning, career guidance and counselling."
- UNESCO (2022) identified the need for individual resilience, institutional resilience and systemic and technological resilience in the face of disruptive global challenges.

6.2 Existing infrastructure

- The ability to transition to a world of online teaching and learning is dependent on the status of ICT infrastructure. National Treasury (2022) highlighted the need for funding increases for blended learning.
- A reliable supply of electricity and connectivity are also required to effectively adapt the TVET sector in the context of COVID-19 and the 4IR. This is a continuing challenge considering the rolling blackouts experienced in South Africa.

7 ALLOCATION AND PRIORITISATION OF RESOURCES IN THE SUBSECTOR

As with all organisations in the ETD sector, the TVET sector is faced with the challenge of making the required provisions to recover from the COVID-19 pandemic as well as to ensure long-term sustainability given the technology shifts induced by the 4IR/5IR. Makgato (2019) emphasised that TVET colleges need to ensure students have a high level of technological and interpersonal skills when entering the labour market to ensure success in the knowledge and technology-driven economy. The following priority areas for resource allocation were identified in the literature: more focus on resourcing infrastructure towards ICT readiness (ETDP SETA, 2022); better equipped and qualified staff (Mboweni, in NMMU, 2020; and Minister Nzimande, in (TVET College Times, 2020); a shift in curriculum and pedagogy to address emerging skills needs (Denhere & Moloi, 2021a); and renewed forms of collaboration to leverage resources (Papier, 2021).

Mboweni (in NMMU, 2020) identified that for remote learning and teaching to be a sustainable option for the TVET sector, lecturer capacity, in terms of e-learning teaching methodologies, would need to be expanded and prioritised in budgets. E-learning should become part of day-to-day operations at TVET colleges. Blended and e-learning modes would furthermore expand the number of students which could be accommodated in the TVET sector, thus a source of additional revenue. Minister Nzimande (in TVET College Times, 2020) noted that significant investments in infrastructure have been made throughout the PSET sector over the years however, it has been fragmented. The Planning Branch in the Department of Education has thus been tasked with improving the coordination of infrastructure developments throughout the PSET sector.

One resource challenge identified at the onset of the remote learning practices in the South African TVET sector was the restricted access to Learner Management Systems (LMS) to coordinate students (Papier, 2021). Prior to the pandemic, approximately 10 colleges had access to an LMS, however not always completely operational, however, in the latter parts of 2020, approximately 25 colleges (50%) had LMSs in place (Singh in NMMU, 2020). This would, however, need to be expanded to 100% of colleges for effective online learning.

The ETDP SETA (2022) presented the ETD skills sector plans which includes the National Treasury Budget Review (2021) MTEF as noted in Table 6 for the post-school education and training subsectors. Considering the ETD skills plan for 2022/2023 to 2023/2024 it is evident that the projected transfer payments to TVET Colleges for 2023/2024 (ETDP SETA, 2021a)were revised down from 13.4 to 13 million. The transfer payments to the TVET sector were however noted to increase from R13 billion in 2022/2023 to R13.2 billion in 2024/2025 in both skills plans. Increasing funds are required for reasons including the importance of ICTs and digital capacities to cope with the demands of blended and online modes of teaching and learning, and to ensure TVET graduates obtain skills prioritised for the 4IR.

Table 6: Government medium-term expenditure on post-school education and training per sub-programme as per ETD sector skills plan 2023/2024 (ETDP SETA, 2022a).

ETD Sub-sector	2020/2021	2021/22	2022/23	2023/24
Government subsidies to 26 Universities	R43.1 billion	R 49 billion	R 49 billion	R 50.4 billion
Transfer payments to 50 TVET colleges	R11.8 billion	R 13 billion	R 13 billion	R 13.2 billion
Expenditure on Community Education and Training programmes	R2 billion	R 2.5 billion	R 2.5 billion	R 2.7 billion

Source: DHET (2023b); National Treasury budget review (2022) in ETDP SETA (2022)

To demonstrate the support for the TVET sector to improve economic participation and social development of young South Africans, Minister Nzimande stated, in the May 2022 DHET budget vote, that the number of students in the TVET sector receiving NSFAS bursaries has been increased from 261 404 in 2020/21 to 329 554 in 2022/23 (Nzimande, 2022). Furthermore, the DHET is committed to develop centres of excellence in 10 TVET colleges to provide training for artisans in one or more priority trades (ETDP SETA, 2022a) including 21st century trades such as mechatronics. The pilot study was funded through the NSF. Furthermore, in support of the movement to an online learning environment, NSFAS secured funds to provide laptops to NSFAS bursary students thereby equipping students with the devices needed to engage with the new curricula and a new world of blended learning.

An additional challenge within the TVET sector is to secure work placements for students to complete their WIL component and thus complete their qualifications. The DHET (2022) has

thus allocated resources to ensure that 10 000 unemployed college students are offered workplace experience. This will improve employability for TVET graduates.

Although COVID-19 resulted in a premature shift to online and remote learning it has however opened the door to a more flexible way of learning. Papier (2021) identified that TVET institutions need to acknowledge systematic weaknesses and collaborate with stakeholders to take advantage of these alternative innovative education solutions to reduce rather than widen inequalities in South Africa. This requires investments in human capital, for example training lecturers in online teaching pedagogies, as well as physical capital, for example ICT infrastructure. PPPs are furthermore a possible means of resource collaboration towards ensuring effective skills development. A potentially valuable collaboration could be between TVET institutions and industry partners (Oviawe, 2018).

8 REVIEW OF ETDP SECTOR SKILLS PLAN

Skills Priority Areas for the ETDP SETA are outlined in the 2022-2023 ETDP SETA Sector Skills Plan (ETDP SETA, 2021) as follows:

1. Ensuring quality teaching and learning across all ETD subsectors (schools, colleges, universities etc.) by building capacity of teachers, lecturers and practitioners through professional development programmes. The strategic focus areas are to improve the capacity of teachers, practitioners, and lecturers in public and private ECD centres, schools, TVET and CET colleges and Public Universities.
2. Enabling effective, efficient service delivery in ETD institutions via improved leadership, governance, administration, and research capacity. The strategic focus areas are to improve administration, management, leadership, governance as well as research capacity to support teaching and training of professionals.
3. Supporting transformation of the post-school system by empowering youth, increasing women representation, assisting disabled learners, leveraging partnerships and integrating technology. The strategic focus areas are to support and increase capacity in public and private PSET entities and other workplaces where skills capacity is affected by increased access, success, and progression.
4. Helping organisations deal with COVID-19 impacts by building digital, e-learning, health & safety skills and tracking skills demand. Promoting entrepreneurship and supporting SMMEs/NGOs in the sector through training interventions and partnerships. The strategic focus areas are to: increase the focus on skills development that include Computer-related/ICT/digital Skills, e-Learning & e-Teaching Skills, First Aid and Basic Health and Safety Skills, Data Management Skills etc; continue with strengthening and capacitating the skills development system and provide support for the mass public employment intervention as envisaged on the ERRP Skills Strategy; insure subsector research conducted by ETDP SETA continually investigates the impact and potential of COVID-19 on skills demand and supply in the ETD sector.

Specifically, regarding the TVET sector, the document outlines a priority skill development plan to improve the capacity of lecturers in vocational education. This includes supporting

initiatives to increase the number of suitably qualified TVET lecturers, as well as improving skills development through strengthening the work integrated learning (WIL) component. In terms of WIL specifically, the document highlights the importance of facilitating high quality workplace-based experiences (WPBE) with the aim of improving WIL integration as a key mechanism for skills development. So, in summary, key TVET-related priority actions are:

- Increasing number of qualified TVET lecturers
- Enhancing skills development of TVET lecturers
- Strengthening the WIL component and facilitating impactful WPBEs.

9 INFORMATION GAPS

The following research gaps which have been identified are:

- **A thorough understanding of the perceptions of industry role players on best practices which would ensure the effectiveness of the WIL component of TVET qualifications.** This should include the potential of PPPs between the workplace and TVET institutions.
- **Technology and ICT infrastructure audits of all TVET Colleges**. ICT infrastructure is vital for the success of digitally transforming, which is noted as a requirement for moving forward in the 4IR. Investments thus need to be made, and this requires an audit of the current ICT infrastructure to identify priority areas.
- **A follow-up TRACER study of TVET graduates modelled on the study originally commissioned by the** DHET (2020a)**.** The COVID-19 pandemic resulted in restrictions which affected student progress academically and within the WIL component of programmes. Identifying the outcomes of graduates is thus required to research areas which need improvements.
- **Investigating the impacts of electricity blackouts on teaching, learning and operational continuity** in the TVET sector is necessary to identity risk mitigation strategies and alternative infrastructure solutions.
- **Disasters risk management in the TVET sector towards preventing future learning losses, particularly of vulnerable groups.** Understanding the risks in the TVET sector could inform targeted interventions to build systemic resilience and minimize learning losses resulting from future shocks or hazards.
- **Transparency and accountability within the TVET sector.** Good governance of the sector requires an understanding of transparency and accountability of all stakeholders in the sector.
- **The impact of TVET lecturer skills development initiatives on improving the quality of qualifications offered in the TVET sector.** The sector aims to increase the professionalisation of lecturers and new courses have been introduced. These should be monitored and impacts tracked towards improving the initiatives.

10 CONCLUSIONS AND IMPLICATIONS FOR SKILLS DEVELOPMENT

The COVID-19 pandemic threw the education sector into a world of distance and e-learning, which educators were not prepared for, particularly in developing countries. The literature review presents the structure of the TVET sector, detailing the history, governance, policy, enrolments, throughput rates, funding, partnerships and skills shortages. Furthermore, the impact of COVID-19 on the sector has been documented as well as what is required for the TVET sector to be successful in the 4IR. The TVET sector aims to improve employability of youth in South Africa, an outcome important for the development of the country. It is evident that the TVET sector is well documented in policy and skills and performance plans however the potential of the TVET sector is not being reached in South Africa with poor throughput rates and less than optimal employment outcomes. University graduates still outperform TVET colleges graduates with unemployment rates of approximately 7% and 33% respectively in 2017 (Statistics South Africa, 2018). TVET completers are however better positioned in the labour market than youth without a tertiary education.

The WIL component, a unique feature of a TVET qualification, is aimed at ensuring students gain the appropriate knowledge, skills and attitudes required to ensure successful adjustment to the workplace. There is however a challenge in South Africa in finding appropriate placements, which has been exacerbated by the COVID-19 pandemic. The DHET (2022) has however committed to place 10 000 unemployed TVET completers – it is however unclear what will happen to completers who do not fall into the group of 10 000. It is thus recommended that the WIL component is regulated and monitored to ensure all TVET students are advantaged by the WIL programme. PPPs should be encouraged to ensure effective skills development.

The COVID-19 pandemic has had a significant impact on the TVET sector. The sector was thrust into a world of remote learning which it was not prepared for. A lack of LMS and resources for e-learning negatively impacted majority of the learners' progress. Besides the ICT infrastructure shortfalls, TVET lectures were not equipped to integrate e-learning into their pedagogic and curriculum practices. It is thus recommended that curriculum revisions

are made to ensure '21st century competencies' are achieved.

The COVID-19 pandemic has thus highlighted the TVET sector requires a digital transformation which has allowed policymaker to grapple with the necessary steps to ensure TVET qualifications are relevant in the 4IR. Upskilling and reskilling TVET lecturers has been identified as a common thread towards improving the outcomes of the TVET sector. The professionalisation of TVET educators is still in the infant stage however commitment to develop lecturer skills is evident through new courses available to TEVT educators. It is still unclear how effective these courses are in improving the outcomes of TVET graduates. In addition to improving their skills, educators also require support in terms of ICT infrastructure for example an effective LMS. To deliver on its mandate, the capacity of management in TVET colleges also needs to be developed. Increasing funding needs to be accompanied with effective governance and management skills to use the funds appropriately.

The government is set on increasing enrolment in the TVET sector with the goal of enrolling 1.25 million students by 2030, however without the necessary quality and support improvements in the sector it will continue to fall behind in performance.

11 RECOMMENDATIONS

The following recommendations emerged from this discussion:

1. Regulate and monitor WIL component
    a. Ensure that all TVET students have access to appropriate placements for the WIL program and encourage public-private partnerships (PPPs) to support effective skills development.
2. Revise curriculum
    a. Make curriculum revisions to ensure that TVET programs achieve "21st-century competencies" and prepare students for the digital age.
3. Digital transformation and upskilling of lectures.
    a. Recognize the need for a digital transformation in the TVET sector and prioritize upskilling and reskilling of TVET lecturers to improve outcomes. Provide support in terms of ICT infrastructure, such as an effective Learning Management System (LMS).
4. Develop management capacity.
    a. Enhance the capacity of management in TVET colleges through training and development programs to effectively utilize increased funding and improve governance and management skills.
5. Improve quality and support
    a. Enhance the capacity of management in TVET colleges through training and development programs to effectively utilize increased funding and improve governance and management skills.
6. Support development of lecturers' e-learning pedagogical skills and digital fluency through dedicated training programs.
    a. This will build capacity for blended and online delivery modes.
7. Facilitate industry partnerships and workplace-based opportunities for TVET students to complete vital work-integrated learning requirements.
8. Undertake regular skills audits and tracer studies of TVET graduates to measure outcomes and identify targets for improvement.
9. Prioritize support for rural and disadvantaged colleges through connectivity,

resources, and other equity measures. Reliable infrastructure is a necessity.

10. Promote public-private partnerships between TVET institutions and industry partners to enhance relevance of programs and secure work placements.

The SETA can drive change by embedding these focus areas into funding rules, partnerships, research agendas, and forums guiding skills policy.

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