

EMPLOYER PERSPECTIVES ON SUSTAINABLE EMPLOYABILITY SKILLS FOR TVET ENGINEERING GRADUATES IN KWAZULU-NATAL, SOUTH AFRICA

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ABSTRACT: Technical and Vocational Education and Training (TVET) is arguably the sector closely connected to industry and employers. The development of the South African economy partly hinged on individuals with both technical and soft skills that are needed by industry. Against this backdrop, sufficiently prepared TVET engineering graduates are an important resource for industry development. However, employees note that the TVET sector does not address the skills needs of industry. Addressing the skills needs of industry is critical for the South African economy. This study seeks to explore employer perceptions on sustainable employability skills for TVET engineering graduates in industry and develop appropriate strategies for addressing the industry needs in the context of South Africa. The study adopted a qualitative case study approach in which semi-structured interviews were used to collect empirical evidence from a conveniently and purposively selected sample of twelve (12) employers from industry. The human capital theory constitutes the theoretical framework of the study. Content analysis was used to analyse the data. The findings revealed that employers needed graduates with both technical and soft skills for sustainable employability. TVET engineering graduates fall short of the skills required by industry. The study recommends strong emphasis on career guidance and development to help programme selection. Furthermore, misalignment of skills could be curbed by ensuring strong ties and communication among role players. A revision on the curriculum was necessary to align with the new technology and address the industry needs. Further studies could focus on how companies could be lured to collaborate with TVET Colleges so that their training becomes a meaningful and empowering experience. Future research could also focus on the relevance of the TVET curriculum to industry needs.

Keywords: Technical and Vocational Education and Training, Employability, Skills, Engineering, Employers, Graduates, Perception

Introduction

Globally, higher education is viewed as an important tool for addressing the economic, human, social and development needs of a nation (Foster, 2005; McGrath, 2012; Mgaiwa, 2021). This includes preparing graduates for the world of work. Kintu et al. (2019) claim that a well-educated and well-trained population increases productivity and economic growth. The TVET sector is viewed as a critical component of any economy as it facilitates skills development leading to socio-economic and technological development. Therefore, a well-organised TVET sector becomes a pillar for economic success (Kintu et al., 2019) by providing creative, innovative, and adaptable graduates to changing circumstances.

The increasing enrolment in the TVET sector in Tanzania, Namibia and South Africa shows the importance of tertiary education in the economy, particularly in preparing graduates for employment (Mgaiwa, 2021). There are fifty public TVET colleges in South Africa. The increasing enrolment of students in the public TVET colleges from 358 393 in 2010 to 673 490 million in 2019 illustrates the sector's increasing importance in transferring knowledge and skills required by industry (Department of Higher Education and Training, 2021). The Department of Higher Education and Training (DHET) targets enrolling 710 000 students by 2024 (Department of Higher Education and Training, 2020). This indicates that the government views the sector as key to the economic development of South Africa.

However, higher education institutions lack the capacity to fulfil these outcomes. "Higher education discourse has long been dominated by employability debate because the major aim of higher education is to generate graduates who are workplace ready" (Mgaiwa, 2021, p. 1). Given this background, the employability of Technical and Vocational Education and Training (TVET) graduates is of interest to policymakers, curriculum

developers, educators, researchers, and society in general. The increasing unemployment among TVET engineering graduates in South Africa is of concern to governments, parents and other stakeholders. The government, parents, and stakeholders are concerned about the investment in the education of TVET engineering graduates who fail to secure employment. At the same time, the TVET engineering graduates are victims of psychological stress due to unemployment (Mgaiwa, 2021). In some cases, the unemployment of graduates leads to social unrest. Therefore, there is increasing pressure to produce employable graduates. Though literature indicates that preparing employable graduates is an enormous challenge (Tarvid, 2015), the TVET engineering education must be structured and delivered to respond to the industry's current needs.

Demographic changes, urbanisation, globalisation, technological innovation, the Fourth Industrial Revolution (FIR), smart cities, and the macroeconomic crises at the beginning of the twenty-first century altered the knowledge and skills required for TVET engineering graduates to be absorbed by industry (Kenayathulla et al., 2019; Kintu et al., 2019; Mgaiwa, 2021; Nugraha et al., 2020). Kintu et al. (2019) contend that new challenges and occupations were created which demanded new skills and competencies. The TVET sector and the skills development programmes were required to address the new needs. Hence, TVET engineering graduates must be innovative and creative to be competitive in the current labour market. Literature is replete with evidence that TVET engineering graduates' barriers to employment include technical skills mismatch and lack of the requisite soft skills (Mgaiwa, 2021). This means that TVET engineering graduates lack the requisite skills and knowledge to seize employment opportunities in the industry.

TVET is viewed as having aspects of the educational process involving general education, the study of technologies and sciences to attain knowledge, practical skills, and attitudes for employment in various sectors of economic and social life (United Nations Educational Scientific and Cultural Organization, 2015) cited in Kintu et al. (2019, p. 2). Therefore, TVET education prepares graduates for the world of work, lifelong learning, and effective participation in sustainable development. TVET education equips graduates with knowledge skills and competencies for sustainable employment, increased productivity, and improved quality of life (Kenayathulla et al., 2019; Kintu et al., 2019). TVET institutions train graduates in specific occupations such as electrical, chemical and civil engineering. Employability skills are important for every TVET graduate (Kenayathulla et al., 2019; Nugraha et al., 2020).

In the light of the foregoing, TVET Colleges should be well placed to respond to the above-mentioned national needs because TVET is an important aspect of achieving relevant and high-quality education for sustainable development, education for all and the Sustainable Development Goals (SDGs). Therefore, it is regarded as part of the lifelong learning agenda (Gustafsson, 2011). As the conduits for skills development, TVET institutions provide opportunities for developing individuals, communities, and society. Historically, the World Bank associated formal TVET intrinsically with the process of industrialisation and economic development (United Nations Educational Scientific Organization, 2016). This means that TVET training may lead to productivity, ultimately leading to a country's economic growth (Mesuwini, 2015).

TVET also plays another essential role in alleviating poverty, through sustained human development and economic growth, with some clear benefits for individuals, families, local communities and the wider society (Naveedyet al., 2018). Therefore, the provision of TVET should address needs and contextual issues pertaining to sustainable development, individual livelihoods, social issues and equity (United Nations Educational Scientific Organization, 2016). Therefore, it means that TVET has a much wide-ranging impact than only promoting skills development for employability (Parkinson & Kester, 2017). TVET is further seen to ensure sustainable lifestyles and occupations by developing knowledge and skills that can meet the needs for specific positions in the labour market and improve personal quality of life (Mesuwini, 2015).

Besides making individuals more employable, TVET should develop skills for work, life or sustainable livelihoods through self-employment or establishing companies or cooperatives. In this manner, everyone should make a living and contribute skills to a developing economy (Tikly, 2013). The assumption is that the TVET should play a dual role. On the one hand, it should contribute to economic development by providing skills needed to compete in an evolving global economic context. TVET should concurrently contribute to poverty alleviation and social justice by increasing participation in education and training targeted at employability, on the other hand. In other words, besides addressing national needs, TVET is considered as a solution to poverty reduction and economic development. Besides technical knowledge, social skills are needed to build harmonious societies. Consequently, TVET colleges should be rooted in their communities, serving the community and regional and national needs. In Australia (Clayton et al., 2013), employers recommended that employees keep current with industry trends by gaining knowledge of the latest techniques and processes.

In South Africa, TVET has become part of the overall educational system. TVET is associated with the training of post-school, pre-employed youths, with the potential to respond to the lifelong learning needs of the general populace. Therefore, the TVET system can be perceived as a path for continuing education and training for both the employed and non-employed people of society (Sayuti&Mujiarto, 2018). TVET Colleges offer different programmes concurrently, such as Adult and Basic Education and Training (ABET), National Certificate (Vocational) (NCV) and the National Accredited Technical Education Diploma (NATED), which is identified as Report 191 or N-Programme. The entry requirement to both programmes is a minimum of Grade 9, though a higher qualification stands a better advantage. These courses aim to equip students with the required skills set for sustainable employability to positively contribute to their community, company, personal life, and the nation.

Various recent similar studies have been conducted. Mesuwini et al. (2020) studied the perceptions of engineering lecturers and graduates on employability skills: a case of a TVET college in KwaZulu-Natal, South Africa. The study revealed that TVET engineering graduates require technical and soft skills for sustainable employability. Similarly, Kenayathulla et al. (2019) conducted a study on the gaps between competence and the importance of employability skills in Malaysia. The study results indicated that graduates had not been adequately trained to acquire the requisite skills needed by industry. A study by Kintu et al. (2019) on employers' perceptions about the employability of TVET graduates in Uganda indicated that graduates do not possess all the skills required by industry. Laguador et al. (2020) studied engineering students' employability skills development needs and employers' feedback on their internship performance. The findings showed that engineering students in the Philippines have excellent internship performance evaluation ratings regarding attitude, personality, knowledge, and skills. Another study by Nugraha et al. (2020) on employability skills in TVET found that TVET graduates must have technical and soft skills. From these studies, it is conspicuous that there is a lacuna in literature on employers' perceptions of sustainable employability skills for TVET engineering graduates in Kwazulu-Natal, South Africa. That is the gap, which this study seeks to close. Hence, this is the unique contribution of this study to the extant literature.

Following the introduction, the rest of the paper is organised as follows: Section 2 covers the rationale and purpose of the study, Section 3 literature review, and Section 4 focuses on the conceptual framework. Section 5 covers the research methodology, while Section 6 presents the data analysis, interpretation and discussion. Conclusions and recommendations are discussed at the end of the paper.

Rationale and Purpose of the Study

The motivation to pursue this study arose from the mismatch between skills acquired by TVET graduates and those required by industry. A study conducted in Egypt (Daoud, 2012) revealed that employers require certain employability skills to match the labour market demand. Some recent studies highlighted the huge gap between the skills expected by employers and those provided by graduates employed directly from TVET colleges (Department of Higher Education and Training, 2014; Hennemann&Liefner, 2010; Legg-Jack, 2014; Osidipe, 2017; Rasul et al., 2013). Furthermore, (Papier et al., 2012) employers were confused and unsure of the three years of NC(V), and training did not prepare TVET graduates adequately for a trade test in terms of the skills required. In simple terms, the TVET programmes are often not representative of the disciplines they prepare graduates. Therefore, employers doubt the credentials and specific competency levels of graduates from these programmes. The aim of closing the skills gap is yet to be realised locally and globally (Allais, 2012; Wallace, 2009). Specifically, the TVET curricula meet neither the needs of TVET students nor those of employers because many graduates are not equipped for trade tests and hence fail them (Okumu&Bbaale, 2019).

In summary, it is apparent from the literature that a disjuncture exists between skills acquired and skills required. Furthermore, there is lack of mainstream literature on this problem in developing countries, especially in Africa (Needham & Papier, 2011). Apparently, less literature is found recording the employer views about the sustainable employability skills needed by TVET graduates. Accordingly, the mismatch highlighted in the literature, and my own experience concerning the skills taught and skills needed undergirds this study. The study explores employers' perspectives on sustainable employability skills for Mechanical, Electrical and Civil engineering graduates. This study is significant as it contributes to the gap identified in the literature regarding industry employer voices on TVET graduates' sustainable employability skills.

Literature Review

Conceptualisation of Sustainable employability skills for TVET engineering graduates

Skill is viewed as an individual's ability to perform a specific task. Pegg et al. (2012, p. 4); Yusoff et al. (2012) define employability as a set of achievements- skills, understandings, and personal attributes- that make graduates more likely to gain employment and be successful in their chosen occupations, which benefits

themselves, the workforce, the community and the economy". Personal attributes such as positive attitude, responsibility, initiative, hardworking and the ability to interact well with other employees are important for sustainable employability. Kornelakis and Petrakaki (2020) comment that graduates need knowledge, skills and attributes to support continued learning and career development. Therefore, the TVET education must impart relevant personal attributes, knowledge, skills and attributes to TVET students for sustainable employability in the industry.

Employability skills refer to critical skills necessary for acquiring, keeping, and performing well in a particular job (Shafie and Nayan (2010) cited in Kenayathulla et al. (2019)). These skills include, but are not limited to, managing resources, communication and interpersonal skills, teamwork, solving complex problems and acquiring and maintaining a job (Kenayathulla et al., 2019). Sustainable employability skills for engineering graduates are social skills, knowledge in engineering, communication skills, information and technology skills, management skills, creativity and innovation, problem-solving and critical thinking (Nugraha et al., 2020). Yusoff et al. (2012) agree by defining engineering employability skills as the ability to perform engineering-related skills, knowledge, and personal attributes to gain employment, maintain employment, and succeed in the engineering field.

The engineering employability skills refer to both technical and non-technical skills (Yusoff et al., 2012). These skills enable an engineering graduate to get a job and become successful in the job. Kenayathulla et al. (2019) concede that soft skills such as human relations skills, communication skills and cognitive skills are key attributes that employers consider when reviewing prospective employees. Employers in the industry look for specific skills required from job applicants that match the skills required to perform a particular job. These skills are expected to be developed by a country's education system (Kenayathulla et al., 2019).

The role of the TVET Sector in the South African economy

The United Nations' Sustainable Development Goals (SDGs) aim to promote sustained, inclusive economic growth, full and productive employment, and decent work for all by 2030 (United Nations Educational Scientific and Cultural Organization (2015), cited in Mgaiwa (2021). The United Nations have identified the provision of quality education as critical for realising all other goals (Mgaiwa, 2021). In the context of Africa, the African Union's agenda 2063's second goal focuses on creating a well-educated and skilled population underpinned by science, technology and innovation (African Union (2016) cited in Mgaiwa (2021, p. 6)). This illustrates that the African Union is committed to creating educated and skilled individuals for the benefit of Africa.

South Africa's vision 2030 aims to achieve "full employment, decent work and sustainable livelihoods to improve living standards and ensure a dignified existence for all South Africans" (South African National Planning Commission, 2020, p. 90). Education is stated in the vision document as one of the preconditions for achieving vision 2030. The TVET is a component of the South African education system. Therefore, it plays an important role through imparting skills and knowledge and attitudes and skills required by industry. Having realised the importance of the TVET institutions, the government of South Africa intends to increase the participation rate in the sector. Approximately 3% of the 20-24-year olds participate in the TVET sector (South African National Planning Commission, 2020). The envisaged participation rate of 25% would accommodate 1.25 million students compared to the current 300 000 (South African National Planning Commission, 2020). This increases the number of individuals trained in the TVET institutions. Such individuals provide skilled labour important for industrial and economic development. In this context, the TVET sector plays a role in the realisation of South Africa's vision.

While the private providers of TVET education may be demand-driven, the public education system is expected to respond to the skills development national agenda within a context of equity (Akoojee, 2008). TVET colleges have important roles in the education landscape of South Africa (Pillay, 2009). On the one hand, the TVET sector is well situated between compulsory general education and university education. On the other hand, TVET is an important link between schooling and the world of work.

This study contributes to the TVET policy discourse by providing a platform for industry personnel voices in skilled personnel training. The TVET college sector is increasing access to education and training opportunities, thereby increasing levels of excellence and innovation (Mesuwini, 2015). Therefore, the White Paper for post-school education and training (Department of Higher Education and Training, 2013b) envisages TVET in overcoming the challenges facing society. In the same vein, TVET sector is viewed as providing "second-chance" opportunities to early school-leavers, as well as other entry routes into tertiary education through "bridging" or undergraduate programmes (Fisher & Scott, 2011). Besides the significant role of TVET in

addressing the acute middle-level skills shortage (Sheppard & Sheppard, 2012), some authors (McGrath et al., 2020; Powell, 2012; Walker et al., 2009) argue for a broader purpose for the South African TVET sector. They believe that TVET should go far beyond the economic domain and focus on human well-being, lifelong learning and supporting learning for multiple purposes. According to the policy on Post-school education and training (2013), the goals of TVET are to:

- provide trained personnel in the applied sciences, technology and business, particularly at craft, advanced craft and technical levels;
- provide the technical knowledge and vocational skills necessary for agricultural, commercial and economic development; and,
- give training and impart the necessary skills to individuals who shall be self-reliant economically (Department of Higher Education and Training, 2013a).

The mismatch between TVET engineering skills and industry needs

There is a global concern that TVET graduates of developed and developing countries lack the skills required by the labourmarket (Ondieki et al., 2018; Van der Bijl, 2015). Though TVET Colleges remain relevant in current socio-economic order, they fall short of industry expectations. Some authors (Blom, 2016; Jacobs, 2005; Malale&Gomba, 2016) state that TVET colleges are often accused of separating theory and practice, leading to irrelevant programmes. In doing so, they fail to meet the needs and expectations of learners, the ever-changing economy, and societal demands. The lack of relevant training programmes often contributes to high unemployment levels, while poorly articulated TVET programmes and qualifications inhibit learner mobility across programmes and between higher education institutions (Mesuwini, 2015). This has been noticed often when NCV students fail to get recognition for university studies.

The South African Institute for Distance Education (2006) and (Adams, 2019) posit that the shortage of suitably qualified TVET college lecturers continues to haunt the TVET sector, hence the need to urgently re-skill lecturers to support new programmes delivery. In response to the challenge, TVET college lecturers have been placed in industries to gain practical experience. Some authors acknowledge the challenges faced by the quality of programmes at TVET colleges, stating that the TVET College system is too small, ineffective, and of poor quality (Akoojee, 2016; Oviawe, 2020). Continuous quality improvement is needed while the TVET system expands. The quality, relevance and currency of programmes offerings need urgent review (Mesuwini, 2015). Growing the TVET sector without focusing on its quality is likely to be expensive and demoralising for young people and further stigmatising the TVET system.

More fundamentally, there appears to be a lack of empowering framework for TVET colleges and industry to partner and work together. On the one hand, colleges seem to lack the capability and credibility to engage with industry on equal terms (Mesuwini, 2015; Mesuwini et al., 2020). Employers are reluctant to work with TVET colleges and do not have faith in the college's ability to produce quality graduates, on the other hand. There is uncertainty about what the NC(V) produces and what output level is achieved (Gewer, 2010; Sibisi, 2019). According to Mesuwini et al. (2020), the consequent doubt at the implementation of NCV caused the industry to turn to other sources for skilled personnel, including taking Grade 12 school leavers for apprenticeship training. As a result, (Magnus et al., 2013; Terblanche&Bitzer, 2018), the vocationally oriented NC(V) programmes offered at colleges are not useful, work-focused or flexible, thus leading employers to reject the programmes offered. Further to that (Makole, 2010), there are fears on whether the NC(V) curriculum prepares learners adequately to enter their specific occupations or an introductory programme preparing learners to qualify for other occupational learning programmes. A study by Monteiro and Leite (2021) in Malaysia revealed the need for empowerment with digital skills to work, particularly during this COVID-19 pandemic.

While there is some existing literature giving voice to some concerns from industry, higher education and academics, it appears that not much has been mentioned about TVET graduates to determine sustainable employability skills set. The research gathered the views of the employers.

Theoretical framework

South Africa strives towards a knowledge-based economy to achieve sustainable economic growth and global competitiveness (Ngepah et al., 2021; Vadra, 2017). Human capital is a critical component of the knowledge-based economy. According to Wuttaphan (2017), the emergence of the knowledge-based economy has made organisations view knowledge, skills, and abilities as invaluable resources for attaining organisational effectiveness and competitiveness. This is supported by the resource-based view, which recognises the importance of industry skills, knowledge, and experience (Venter & Botha, 2019). McConnell and Brue (2009, p. 85) note that "a more educated, better-trained person is capable of supplying a larger amount of useful, productive effort than one with less education and training." Hence, the human capital theory is appropriate for

this study. Human capital refers to "A collection of individual attributes, such as knowledge, skills, experience, training, abilities, talent, intelligence, and judgment" (Mgaiwa, 2021, p. 6). Mgaiwa (2021, p. 6) posits that, "The fundamental argument of the human capital theory is that education and training are investments that make people more productive." The theory views human resources as a source of value creation (Wuttaphan, 2017). Citizens acquire the requisite industry knowledge, skills, attitudes and abilities through the relevant technical education and training. In the South African context, the TVET education and training imparts such important attributes required by industry. Failure by the TVET sector to address the needs of the industry may be attributed to a mismatch between the industry needs and the knowledge and skills imparted by the TVET College sector.

Methodology

The study adopted a qualitative case study approach to explain employers' responses to skills sets required by TVET engineering graduates for sustainable employability. The research falls within the interpretivist research paradigm. Within this framework, the employers were regarded as social beings situated within a particular social background within which they work. The interpretive paradigm is concerned with understanding the world from the subjective experiences of individuals (Cohen et al., 2017; Kekeya, 2019). Data were gathered from twelve Engineering graduate employers, four from each field of Mechanical, Electrical and Civil Engineering.

The sample size selection is supported by (Fugard & Potts, 2015), who suggested that 6–10 participants are recommended for qualitative study interviews and categorised such qualitative studies as small (Braun & Clarke, 2013). The study participants were conveniently and purposively selected to get insights into the sustainable employability skills of TVET engineering graduates. The convenience sampling method was chosen on the grounds of proximity and affordability. Purposive sampling allowed handpicking potential respondents to be included in the sample based on their possession of particular characteristics being sought (Cohen et al., 2017; Cohen et al., 2011). Participants who were perceived to have relevant information were selected for the study. Semi-structured interviews were employed in collecting data from the research participants.

The researcher obtained informed consent from respondents before collecting information from them. The process was planned to take place in the comfort of the respondents' space, giving room for respondents to decline or withdraw at any time. Strict anonymity and confidentiality were maintained throughout the study. To ensure anonymity, employers were numbered from one (1) to twelve (12). Furthermore, the issue of informed consent was addressed before data collection from respondents (Mesuwini, 2015; Mesuwini et al., 2020).

Data Analysis, Interpretation and Discussion

The perceptions of engineering industry employers regarding skills needed by engineering graduates for sustainable employment were gathered from the semi-structured interviews. The employers represented the three fields of civil, electrical and mechanical engineering. The following personality traits were considered as essential in employees: - Being a self-starter; independent; friendly; well organised; quick learner; good judgment; creative; flexible and outcomes and goal-directed. The traits align with literature (Kulkarni, 2016; Saravanan, 2009), who stressed employability skills as essential in the current global job market, saying they will undoubtedly help students develop their employability skills and efficiently execute their assigned duties in any work environment.

Employer 1 echoed:

The basis must be properly laid so that they have an understanding of what career they enter into. A lot of school leavers want to become millwrights, electricians, boilermakers and fitters but they know nothing about what the trade entails.

Employer 1 noted that some school leavers wanted to become millwrights, electricians, boilermakers and fitters, without knowing anything about the trade. It reflected the lack of career guidance or background knowledge about the trade. The following finding attests to career guidance issues:

It seems those who come to college want to become electricians, and when it is full, you redirect them to other fields. This shows that they do not know what they want to become (Employer 11).

It can be assumed that some graduates may have engaged in a trade (discipline) without getting adequate information about it. Employer 1 added: "A handful knows what they want because if one really wants to become an electrician, there is no need to go to civil because that is where space is available." This attests to

TVET College enrolment procedures when enrolling students for courses. Their primary aim seemed to fill available spaces rather than ensure that students enrolled for their preferred career choices. A civil engineering Employer 4 showed some displeasure with political pressure and said:

Sometimes political pressure forces colleges to succumb to recruiting undeserving students into TVET colleges (Employer 4).

The response suggested that the enrolment processes had some external influences where people who did not qualify were accepted into TVET training as instructed by senior political figures. In a few words, Employer 2 said:

Good knowledge of engineering drawing is required, production of quality work, conforming to standards, working within given time frames, and meeting delivery dates. In addition, experience is required, but the students do not have it (Employer 2).

When students acquire skills to produce quality work as per standard specifications, they satisfy the human capital theory as they become more productive and skilful (Mgaiwa, 2021). Furthermore, (Mgaiwa, 2021) added that productive individuals would be more employable. Employer 5 further propounded that,

A handful of students know what they want to do because if one really wants to become an electrician, there will be no need to go to civil engineering because that is where space is available (Employer 5).

The findings align with the theory, which suggests that employability builds a character that catalyses employment chances in the industry. Employer 3 responded:

Students bring papers, but they fail to cope with the work when it comes to production. It is difficult to facilitate training if someone lacks skills because everyone is there for production. A company trains people according to the needs of the company so that they can produce as required. Some companies use those graduates for sweeping and carrying things from place to place because they cannot afford the time to give proper training (Employer 3).

Employer 3 reiterated that it was difficult to facilitate training if someone lacked skills because every aspect of the business was mainly for production and profit-making. It was further alleged that some companies used graduates for menial tasks because they could not afford the time to give proper training. In this view, the industry personnel perceived TVET graduates as mere helpers than trainees who needed to learn practical skills and eventually qualify as artisans. The findings resonate with (Lei & Yin, 2019), who evaluated the benefits and drawbacks of internships and revealed that students did menial work assignments and routine and boring tasks. Literature concurred that employers lacked time and training commitment (Lei & Yin, 2019). Even though sweeping formed part of safety protocols and housekeeping, it appeared from the findings that some graduates served more as cleaners at the expense of learning practical trade skills. Most companies suggested that their workload afforded them less time to guide and train students. Employer 7 reiterated,

Some students have a very bad attitude. They do not take their training seriously. It also compromises company safety measures (Employer 7).

Engineering industries perceived the need for specific skills from Civil, Electrical and Mechanical Engineering graduates for their sustainable employability. The theory highlighted the quality of skills, training and experience as important facets to develop employability skills (Mgaiwa, 2021). The employers showed versatility in their respective fields of expertise of mechanical, civil and electrical. However, Employer 7 echoed concerns over some attitudes displayed by graduates, which did not promote employability skills. The finding was in line with the literature, which said that most companies valued safety practices to minimise risk and hazards (Mora et al., 2018). Employer 10 reinforced issues around safety:

Safety is the first important aspect taught so that they can work safely, think safely and have safety as a priority. Safety is indoctrinated into everyone in industry. It is a priority (Employer 10).

Employer 10 reflected the importance of industry safety. The word “indoctrination” is intended to influence recipients to believe in what they were told without questioning the veracity or authenticity of the conveyed information (Ioana&Cracsner, 2016). However, in industry, there are reasons given for every safety decision

that is taken. For example, videos show accidents caused by negligence and failure to adhere to precautions, from where safety lessons are drawn.

The identified skills included: good knowledge of engineering drawing; a proper background of the trade is required, which is N3 level with a minimum pass of 50% in Mathematics and Science and a relevant trade theory subject of a related field of study. Background of the trade theory subject would possibly be an added advantage giving a fundamental understanding of the trade. It appears that working within given time frames, meeting delivery dates, conforming to standards and safety precautions were perceived as important skills to work and think safely, showing quality workmanship. Employers commented on the curricula indicating that they were old and not in line with industry transformation. It was commented further that most TVET lecturers have not been in the industry. Therefore, understanding the concepts and teaching were different issues altogether (Mesuwini, 2015).

The interview with employers revealed that their principal focus was on the skills related to the economic and social pillars of sustainable development (Pillay, 2009). They focused on imparting skills in line with their operations, and they valued time and safety precautions. Safety was highlighted as compulsory for everyone to follow the safety rules to the book. Generally, strictly following safety guidelines prevents or reduces workplace accidents, therefore reducing downtime and losses.

Conclusion and Recommendations

The study explored what skill sets were needed by Mechanical, Electrical and Civil Engineering graduates for sustainable employability as perceived by employers in the engineering industry. The industry employers attempted to address the mismatches by defining the required skills sets according to industry needs and equipping the graduates with life-long skills for self-sustenance. The findings indicated that skills, training, and experience are important aspects of developing employability skills. The study revealed that graduates were perceived to require sustainable employability skills, which were responsive to the prescripts of industry. It was recommended that the NATED curricula needed urgent revision in order to align with industry trends. A proposal was put forward to improve and increase technical schools so that those students who aspired to engage in trade skills would have a background of what the trade covered. In this regard, the career guidance process would be simpler since students would have a strong background in their programmes of choice.

Since companies were exposed to having no time to train graduates due to their strict target deadlines adequately, a training centre in the company or partnership with a TVET College would ensure proper training for graduates as most training centres tend to mirror the skills expectations of graduates the industry. Some form of tax rebates to lure companies into skills development could incentivise the move. Further studies could focus on how companies could be lured to collaborate with TVET Colleges so that their training becomes a meaningful and empowering experience. Future research could also focus on the relevance of the TVET curriculum to industry needs.

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References

- Adams, W. C. (2019). Factors that influence the employability of Technical Vocational Education and Training (TVET) graduates. A comparative study of two TVET colleges in the Gauteng Province University of the Witwatersrand]. Johannesburg.
http://wiredspace.wits.ac.za/bitstream/handle/10539/29455/Wendy%20Charity%20Adams_324793_Research%20Report.pdf?sequence=1
- African Union. (2016). *Agenda 2063 linkages with the sustainable development goals (SDGs)*.
<http://agenda2063.au.int/en/documents/agenda-2063-linkages>
- Akoojee, S. (2008). Post-school private education and training providers in South Africa: What works! *VOCAL: The Australian Journal of Vocational Education and Training in School*, 7, 97-106.
- Akoojee, S. (2016). Developmental TVET rhetoric in-action: the White Paper for post-school education and training in South Africa. *International journal for research in vocational education and training*, 3(1), 1-15.
- Allais, S. (2012). Will skills save us? Rethinking the relationships between vocational education, skills development policies, and social policy in South Africa. *International Journal of Educational Development*, 32(5), 632-642.
- Blom, R. (2016). *Towards a vocational pedagogy for South African TVET Educators*
https://www.academia.edu/22143098/Towards_a_Vocational_Pedagogy_for_South_African_TVET_Educators

- Braun, V., & Clarke, V. (2013). *Successful qualitative research: A practical guide for beginners*. Sage.
- Clayton, B., Jonas, P., Harding, R., Harris, M., & Toze, M. (2013). *Industry currency and professional obsolescence: what can industry tell us?* <http://www.ncver.edu.au>
- Cohen, L., Manion, L., & Morrison, K. (2017). *Research methods in education* (8th ed.). Routledge.
- Cohen, M. A., Rogelberg, S. G., Allen, J. A., & Luong, A. (2011). Meeting design characteristics and attendee perceptions of staff/team meeting quality. *Psychology Faculty Publications*, 15(1), 1-19. https://digitalcommons.unomaha.edu/psychfacpub?utm_source=digitalcommons.unomaha.edu%2Fpsychfacpub%2F96&utm_medium=PDF&utm_campaign=PDFCoverPages
- Daoud, W. (2012). Higher education in Egypt and needed employability skills in the domestic labor market: case study from Ain Shams University, faculty of engineering American University in Cairo]. Cairo. <https://fount.aucegypt.edu/etds/1307/>
- White Paper for Post-School Education and Training: Building an expanded, effective and integrated post-school system, (2013b).
- White Paper for Post School Education and Training, (2014). [www.che.ac.za/sites/default/files/publications/pdf/Strategic Plan 2020-2025](http://www.che.ac.za/sites/default/files/publications/pdf/Strategic%20Plan%202020-2025.pdf), (2020). <https://www.dhet.gov.za/SiteAssets/DHET%20Strategic%20Plan%202020.pdf>
- Statistics on Post-School Education and Training in South Africa: 2019, (2021). <https://www.dhet.gov.za/DHET%20Statistics%20Publication/Statistics%20on%20Post-School%20Education%20and%20Training%20in%20South%20Africa%202019.pdf>
- Fisher, G., & Scott, I. (2011). Background paper 3: The role of higher education in closing the skills gap in South Africa. *Academia*. https://www.academia.edu/download/35309630/Higher_Education_in_SA.pdf
- Foster, A. (2005). A review of the future role of further education colleges. *DFES Publication, USA, Pages, 145*.
- Fugard, A. J., & Potts, H. W. (2015). Supporting thinking on sample sizes for thematic analyses: a quantitative tool. *International Journal of Social Research Methodology*, 18(6), 669-684.
- Gewer, A. (2010, 27 - 29 October 2010). *Choices and chances: FET Colleges and the transition from school to work* National Business Initiative Implementation Processes, Johannesburg. http://www.tips.org.za/files/choices_and_changes_fet_colleges_and_the_transition_from_school_to_work.pdf
- Gustafsson, I. (2011). Education as a way to strengthen the capacity of rural people to improve food security; Towards a tool for analysis. *Paper commissioned by the Task Group on Training for Technicians for Capacity Development (OEKD/FAO) and the Education for Rural People Flagship Partnership*.
- Hennemann, S., & Liefner, I. (2010). Employability of German geography graduates: The mismatch between knowledge acquired and competences required. *Journal of Geography in Higher Education*, 34(2), 215-230.
- Ioana, I., & Cracsner, C. (2016). Education vs. indoctrination. *Scientific Research and Education in the Air Force*, 561-574.
- Jacobs, L. (2005). *Inklusiewe onderwys: 'nbestuursperspektief* [University of the Free State].
- Kekeya, J. (2019). The commonalities and differences between research paradigms. *Contemporary PNG Studies*, 31, 26.
- Kenayathulla, H. B., Ahmad, N. A., & Idris, A. R. (2019). Gaps between competence and importance of employability skills: evidence from Malaysia. *Higher Education Evaluation and Development*, 13(2), 97-112. <https://www.emerald.com/insight/content/doi/10.1108/HEED-08-2019-0039/full/html>
- Kintu, D., Kitainge, K. M., & Ferej, A. (2019). An Exploration of Strategies for Facilitating Graduates' Transition to the World of Work: A Case of Technical, Vocational Education and Training Graduates in Uganda. *International Journal of Vocational Education and Training Research*, 5(1), 1-9.
- Kornelakis, A., & Petrakaki, D. (2020). Embedding employability skills in UK higher education: Between digitalization and marketization. *Industry and Higher Education*, 34(5), 290-297.
- Kulkarni, A. M. (2016). Management perspective (academic and administrative aspect) in career planning of students during 2007 to 2013 with reference to selected MCA institutes in Pune region [Tilak Maharashtra Vidyapeeth].
- Laguador, J. M., Chavez-Prinsipe, N. H., & De Castro, E. L. (2020). Employability Skill Development Needs of Engineering Students and Employers' Feedback on Their Internship Performance. *Universal Journal of Educational Research*, 8(7), 3097-3108.
- Legg-Jack, D. W. (2014). Employability skills of technical college graduates: a case study for Government Technical College (GTC) in Ahoada Rivers State Nigeria
- Lei, S. A., & Yin, D. (2019). Evaluating benefits and drawbacks of internships: Perspectives of college students. *College Student Journal*, 53(2), 181-189.
- Magnus, G., Prinsloo, F., Bird, A., & Singh, A. (2013). Concept Document – Building a Technical and Vocational Education and Training System in South Africa.
- Makole, K. (2010). *The challenges of National Curriculum Vocation (NCV) and its planned review*. <http://www.sadtu.org.za/docs/disc/2010/ncv.pdf/>

- Malale, M. M., &Gomba, G. K. (2016). Stakeholders' Perceptions About Technical and Vocational Education and Training Colleges in South Africa: A Literature. *Towards Excellence in Educational Practices*. http://aarf.org/wa_files/saiced2016-proceedings.pdf#page=291
- McConnell, B., & Brue, S. (2009). Macpherson. *EconomíaLaboral*, 430-440.
- McGrath, S. (2012). Vocational education and training for development: A policy in need of a theory? *International Journal of Educational Development*, 32(5), 623-631.
- McGrath, S., Ramsarup, P., Zeelen, J., Wedekind, V., Allais, S., Lotz-Sisitka, H., Monk, D., Openjuru, G., &Russon, J.-A. (2020). Vocational education and training for African development: a literature review. *Journal of Vocational Education & Training*, 72(4), 465-487.
- Mesuwini, J. (2015). An exploration of the skills set required for sustainable employability of Technical Vocational Education and Training (TVET) engineering graduates: the case of Majuba TVET college, Newcastle, KwaZulu-Natal
- Mesuwini, J., Singh-Pillay, A., & Bomani, M. (2020). Perceptions of Engineering Lecturers and Graduates on Employability Skills: A Case of a TVET College in Kwazulu-Natal, South Africa. *INTERNATIONAL JOURNAL OF SOCIAL SCIENCES AND HUMANITY STUDIES*, 12(2), 416-432. https://www.sobiad.org/eJOURNALS/journal_IJSS/arhieves/IJSS-2020-2_ek/j-mesuwini.pdf
- Mgaiwa, S. J. (2021). Fostering graduate employability: Rethinking Tanzania's university practices. *SAGE Open*, 11(2), 1-14. <https://doi.org/10.1177/21582440211006709>
- Monteiro, A., &Leite, C. (2021). Digital literacies in higher education: skills, uses, opportunities and obstacles to digital transformation. *Revista de Educación a Distancia (RED)*, 21(65).
- Mora, M., Juan, F., Medina, R., Angie, C., &Ramírez, A. E. (2018). Human recognition algorithm for industrial collaborative robots in automated waste separations tasks.
- Naveedy, A., Khaleghinezhad, S., &Khallaghi, A. (2018). Designing a framework for training vocational and technical skill to students at second-level secondary education in academic branch: A qualitative study. *Technology of Education Journal (TEJ)*, 13(1), 120-134.
- Needham, S., &Papier, J. (2011). Practical matters: What young people think about vocational education in South Africa. *City & Guilds Centre for Skills Development*. <https://www.voced.edu.au/content/ngv:52208>
- Ngepah, N., Saba, C. S., &Mabindisa, N. G. (2021). Human capital and economic growth in South Africa: A cross-municipality panel data analysis. *South African Journal of Economic and Management Sciences*, 24(1), 1-11.
- Nugraha, H. D., Kencanasari, R. V., Komari, R. N., &Kasda, K. (2020). Employability Skills in Technical Vocational Education and Training (TVET). *INVOTEC*, 16(1), 1-10.
- Okumu, I. M., &Bbaale, E. (2019). Technical and vocational education and training in Uganda: A critical analysis. *Development Policy Review*, 37(6), 735-749.
- Ondieki, C., Kimani, G. N., &Tanui, E. K. (2018). Deficiencies of Competency Based Education and Training in Higher Education Institutions in Kenya. *Scholars Journal of Arts, Humanities and Social Sciences*, 1437-1447. <http://saspjournals.com/sjahss>
- Osidipe, A. (2017). Prospects for TVET in Developing Skills for Work in Nigeria. *Prospects*, 8(21).
- Oviawe, J. I. (2020). Technical education lecturers' knowledge of students' engagement in application of interactive instructional strategies. *Journal of Technology and Humanities*, 1(1), 1-10.
- Papier, J., Needham, S., &Mcbride, T. (2012). Contemporary issues in public FET colleges. *Connecting capabilities, individuals and institutions*.
- Parkinson, A., & Kester, K. (2017). Competing paradigms for basic education: human capital and human capabilities and what they mean for the world bank and UNESCO.
- Pegg, A., Waldock, J., Hendy-Isaac, S., & Lawton, R. (2012). *Pedagogy for employability*. Higher Education Academy.
- Pillay, T. (2009). Merging identities: a narrative inquiry into educators' experiences of the merging process of further education and training (FET) colleges in South Africa and the extent to which the merger has impacted on their identity development University of KwaZulu-Natal]. Durban. <http://ukzn-dspace.ukzn.ac.za/handle/10413/3160>
- Powell, L. (2012). Reimagining the purpose of VET—Expanding the capability to aspire in South African Further Education and Training students. *International Journal of Educational Development*, 32(5), 643-653.
- Rasul, M. S., Abd Rauf, R. A., &Mansor, A. N. (2013). Employability skills indicator as perceived by manufacturing employers. *Asian Social Science*, 9(8), 42.
- Saravanan, V. (2009). Sustainable employability skills for engineering professionals. *The Indian Review of World Literature in English*, 5(2), 1-9.
- Sayuti, M., &Mujiarto, M. (2018). Employability skills in vocational high school context: An analysis of the KTSP curriculum. *Journal of Vocational Education Studies (JOVES)*, 1(2), 33-44.
- Shafie, L. A., &Nayan, S. (2010). Employability awareness among Malaysian undergraduates. *International journal of business and management*, 5(8), 119.

- Sheppard, C., & Sheppard, R. (2012). A statistical overview of further education and training colleges. *Shaping the Future of South Africa's Youth*, 63-102.
- Sibisi, P. N. (2019). Lecturers' experiences in the implementation of the National Certificate (Vocational) Engineering curriculum in a selected Technical Vocational Education and Training college UNIVERSITY OF SOUTH AFRICA]. Pretoria. <https://core.ac.uk/download/pdf/328838805.pdf>
- South African Institute for Distance Education. (2006). Facilitating Learner Centred Learning and Teaching – A Guide for Lecturers at Technical and Vocational Teachers Training Colleges.
[Record #740 is using a reference type undefined in this output style.]
- Tarvid, A. (2015). The effectiveness of access restriction to higher education in decreasing overeducation. *Economic Analysis and Policy*, 45, 11-26.
- Terblanche, T., & Bitzer, E. (2018). Leading curriculum change in South African technical and vocational education and training colleges. *Journal of Vocational, Adult and Continuing Education and Training*, 1(1), 104-125.
- Tikly, L. (2013). Reconceptualizing TVET and development: a human capability and social justice approach. *Revisiting global trends in TVET: Reflections on theory and practice*, 1-39.
- United Nations Educational Scientific and Cultural Organization. (2015, 17 August 2015). *Proposal For The Revision Of The 2001 Revised Recommendation Concerning Technical And Vocational Education* General Conference: 38th Session, Paris, 2015, Paris.
- United Nations Educational Scientific and Cultural Organization. (2015, 17 August 2015). *Proposal For The Revision Of The 2001 Revised Recommendation Concerning Technical And Vocational Education* General Conference: 38th Session, Paris, 2015, Paris.
- United Nations Educational Scientific Organization. (2016). Strategy for technical and vocational education and training (TVET)(2016-2021). *UNESCO*. <https://www.voced.edu.au/content/ngv:73717>
- Vadra, R. (2017). Knowledge economy in BRICS: A case of South Africa. *Journal of the knowledge economy*, 8(4), 1229-1240. <https://doi.org/https://doi.org/10.1007/s13132-017-0512-y>
- Van der Bijl, A. J. (2015). Mentoring and the development of educators in South African Technical and Vocational Education Stellenbosch: Stellenbosch University].
- Venter, P., & Botha, T. (2019). *Practising Strategy: A South African Context*. Juta and Company (Py) Ltd.
- Walker, M., McLean, M., Dison, A., & Peppin-Vaughan, R. (2009). South African universities and human development: Towards a theorisation and operationalisation of professional capabilities for poverty reduction. *International Journal of Educational Development*, 29(6), 565-572.
- Wallace, R. M. (2009). Empowering disenfranchised learner identities through ePortfolios. *Learning Communities: International Journal of Learning in Social Contexts*(2), 104-123.
- Wuttaphan, N. (2017). Human capital theory: The theory of human resource development, implications, and future. *Rajabhat Journal of Sciences, Humanities & Social Sciences*, 18(2), 240-253. <https://ph01.tci-thaijo.org/index.php/psru/article/view/76477>
- Yusoff, Y. M., Omar, M. Z., Zaharim, A., Mohamed, A., & Muhamad, N. (2012). Formulation in evaluating the technical skills of engineering graduates. *Procedia-Social and Behavioral Sciences*, 60, 493-499. <https://www.sciencedirect.com/science/article/pii/S1877042812038724>