



Unemployed Engineering College Graduates' Views on the Curriculum Offered by the South African TVET Sector

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ABSTRACT

This paper explores how TVET College engineering graduates perceive the effectiveness of their curriculum in preparing them for employment and entrepreneurial opportunities in South Africa. Using Amartya Sen's Capability Approach, the study redefines employability as a function of a person's capabilities—real opportunities to achieve meaningful outcomes, influenced by personal, social, and environmental factors. A questionnaire was completed through purposive sampling of 210 unemployed NC (V) engineering graduates from three public TVET Colleges in Gauteng, South Africa. Descriptive statistics were used to analyze the data. The results show that the NC (V) engineering curriculum does not sufficiently prepare graduates for industry demands. Additionally, the findings suggest that the curriculum should be updated to include technological advancements and industry context. This research contributes to TVET literature by empirically identifying curriculum gaps from graduates' perspectives and framing TVET reform as an extension of free education driven by the Capability Approach. Little prior research has focused on this area. It also confirms anecdotal evidence of employer bias against TVET qualifications and highlights the significance of integrating Work-Integrated Learning (WIL), updating curricula, and soft skills training. Recommendations include revising curricula to strengthen WIL, fostering public-private partnerships to increase industry recognition, and advocating for social change to reduce prejudices and promote equitable career opportunities for TVET graduates. These insights aim to help vocational institutions and policymakers improve engineering curricula, better prepare graduates for the job market, and support broader economic growth and development.

KEYWORDS

Engineering curriculum; Engineering graduates; National Certificate (Vocational) programme; Technical and Vocational Education and Training.

INTRODUCTION

The increasing unemployment rates and continuing economic hardship in South Africa and other emerging economies have heightened research interest in Technical and Vocational Education and Training (TVET) curricula, especially their responsiveness to labour market demands (Kana & Letaba, 2024). The relevance of TVET curricula in South Africa is being questioned, where the unemployment rate for TVET engineering graduates is 33%, compared to 11% for university graduates (Statistics South Africa, 2023). Despite a 2.5% increase in TVET enrolment from 657,133 in 2018 to 673,490 in 2019 (DHET, 2021), graduates' employability continues to decline, highlighting a troubling gap between training and industry needs. The situation is worsened by a lack of research on vocational andragogy and effective learning models tailored for both local and international labour markets (Mama, 2022). Recent research emphasizes the need to address this gap. Wedekind (2021) points out how systemic obstacles hinder South Africa's vocational training system, while Allais (2022) argues that increasing competition in a shrinking job market stifles the growth and success of public TVET institutions. Anthonie (2023) questions the overall importance of TVET institutions but overlooks the quality of the curricula and their andragogy. Additionally, concerns persist about whether the curriculum incorporates practical industry experience, which is essential in the engineering field (Servant-Miklos et al., 2023). This crisis is further evidenced by media reports of TVET graduates seeking informal employment (Sibiya, 2023). Misalignment of the curriculum with sector needs undermines employer confidence and graduate employability, negatively impacting student satisfaction and economic growth (Al-Shehab, et al, 2024).

Globally, TVET institutions play an important role in promoting employment and entrepreneurial growth opportunities; however, South Africa's TVET engineering curriculum battles with developing graduates with competitive skills in a country where artisans are in considerable demand (Du Preez, 2022). This study looks into unemployed TVET engineering graduates' perceptions of the National Certificate Vocational (NCV) curriculum's efficiency in preparing them for job prospects and entrepreneurial endeavours. The curriculum's lack of responsiveness to market demands hinders graduates' capacity to find work as well as establish effective entrepreneurship entities (Mthethwa & Naidoo, 2024). Drawing on Sen's Capabilities Approach, which underscores strengthening individuals through opportunities (Sen, 2020), this study contends that an effective TVET curriculum should improve graduates' employment skills and participation in the general growth of the economy.

The role of TVETs is still crucial globally and to the South African economy, not only for helping young people find work but also for empowering them so that they can create job opportunities. Therefore, this paper explores the views of TVET engineering graduates on the extent to which engineering curricula prepare them for employment opportunities and entrepreneurial endeavours in the South African labour market. The following main research question (MRQ) is developed based on the above purpose. Does the South African NC(V) engineering curriculum in TVET colleges adequately prepare graduates with the required knowledge and skills to meet the engineering sector employment requirements after completing the programme? The following sub-research questions (SRQ) were developed to answer the main research question:

SRQ1. What are the NC(V) engineering graduates' views on the curricula's ability to accommodate authentic WIL practices in the engineering industry?

SRQ2. How do NC(V) engineering graduates perceive their recognition in the engineering industry?

SRQ3. To what extent does the NC(V) engineering programme in public TVET colleges prepare its graduates for job searching and interview management skills?

LITERATURE

CONCEPTUALISING SEN'S CAPABILITY APPROACH

Amartya Sen's Capability Approach offers a powerful lens for evaluating the efficacy of TVET curricula in advancing the employment prospects of graduates and their potential to become successful entrepreneurs. Contrary to conventional human capital theories that focus on acquiring skills for economic output (Schultz, 1961; Becker, 1964), Sen's framework emphasizes capabilities —the actual possibilities individuals have to achieve valued outcomes (functionings), such as employment and business entrepreneurship. In the South African TVET context, this type of approach shifts the concentration from simply offering theoretical knowledge and certificates to their graduates to creating opportunities to transform education into significant participation in the engineering employment sector.

BRINGING GLOBAL TVET MODELS INTO CONTEXT

The German dual TVET model, which thrives on powerful public-private partnerships, combines workplace training with classroom instruction, financially supported by commercial entities and the public sector (Schröder, 2022). Apprentices receive stipends that enhance their economic freedom and enable them to acquire skills that align with industry needs, promoting job readiness. This model's strong emphasis on practical, industry-driven competencies ensures that graduates are job-ready, addressing South Africa's 47% unemployment rate among college graduates in engineering (Kana & Letaba, 2024). Germany's framework, which prioritizes the importance of workplace experience, can also enhance South African TVET college engineering graduates' ability to engage in the economy, an essential aspect of Sen's theory.

On the other hand, Canada's e-Apprentice program makes use of computerised platforms, combining 15–20% online or classroom instruction with 80–85% practical workplace experience (Canadian Apprenticeship Forum, 2023). Sen's focus on equal opportunities is in line with this adaptable and affordable model, which improves training access, especially for the South Africans' mostly underprivileged youth who fill up spaces in the South African public TVET colleges. In the South African TVET context, where a sizeable number of TVET colleges are located in rural areas, the e-Apprentice approach might counter the geographical barriers while students benefit by acquiring skills online but adhering to industry regulatory frameworks. Canada's digital flexibility and Germany's industry collaboration could improve South African TVET's capacity to develop skills like

technical proficiency and adaptability. As suggested by Sen's framework, South Africa could empower unemployed engineering graduates, close the employability gap, and advance economic inclusion by incorporating these models.

ALIGNING THE SOUTH AFRICAN TVET CURRICULUM WITH THE MARKET NEEDS

Recent research highlights ongoing alignment issues between South African TVET curricula and labour market needs, which is inhibiting graduates' ability to find work (Mthethwa & Ndebele, 2022). As noted by Allias (2020), TVET colleges are underfunded and produce graduates who have inadequate opportunities for employment because their curricula concentrate on concepts of theory over authentic, practical, industry-relevant competencies. Sibiya et al emphasise that employer opinions frequently underrate TVET qualifications, with recruitment advertisements hardly recognising NCV qualifications as comparable to conventional higher education. qualifications, subsequently limiting graduates' social conversion factors. This lack of acknowledgement demonstrates a societal hurdle to capability realisation, as workplaces do not consider TVET graduates to be suitable candidates for engineering positions. The paucity of studies on TVET curricula's responsiveness to industry demands worsens these issues. Mthethwa and Ndebele (2022) identify an important need in empirical research on how WIL gets implemented in South African TVET colleges, especially in the Engineering programs. They conclude that inadequate exposure to the industry limits the capacity of students to gain and cultivate real-world abilities. Based on a capability approach, this implies that graduates are unable to translate education into employability when environmental conversion factors, such as workplace access, are not provided. Furthermore, Jacobs et al. (2023) contend that modern pedagogical approaches, such as workplace access digital game-based learning, remain untapped in TVET, given their established efficacy in improving engineering education.

BRIDGING THE GAP THROUGH WORK-INTEGRATED LEARNING (WIL)

WIL has widespread recognition as an important component for boosting the job readiness of TVET graduates. However, there is a paucity of studies on how to efficiently incorporate WIL into the South African TVET system (Mthethwa & Ndebele, 2022). On the same note, Oosthuizen et al. (2021) opine that there is a research gap on Work Integrated Learning for Lecturers (WILL). They conclude that a lack of exposure to the sector reduces the lecturers' capacity to present curricula that effectively link the gap between theory and application. Similarly, Mokhothu and Callaghan (2024) highlight the dearth of empirical data that demonstrates how WIL experiences for TVET lecturers can improve the implementation of the curriculum. They further contend that partnerships between lecturers and industry remain crucial for linking training with market demands. Fisher and McGhie (2023) argue that the South African TVET system is largely dependent on theoretical teaching that falls short of meeting the industry demands, resulting in a disparity between TVET qualifications and engineering industry expectations. According to Chikoko (2021), South African TVET curricula frequently overlook soft skills and entrepreneurial training, both of which are essential for managing competitive job markets or generating opportunities for self-employment. Similarly, Kanwar et al. (2020) advocate for TVET programmes that encompass technological innovations and lifelong learning to better equip students for evolving industrial contexts. However, the South African curricula lag in implementing such technological advances, as evidenced by the Umalusi (2024) report that some of the NC(V) assessments were irrelevant or fell short of meeting the expected levels.

METHODOLOGY

RESEARCH DESIGN

This study used a quantitative research design to examine how unemployed NC(V) engineering graduates perceive the effectiveness of the South African TVET curriculum in preparing them for job opportunities and entrepreneurship. A quantitative approach involves collecting and analyzing numerical data to test hypotheses or measure variables, often using statistical methods to generalize findings to a larger population (Creswell & Creswell, 2023). It is appropriate for measuring perceptions and attitudes through structured instruments. The quantitative approach was chosen for several reasons, aligning with the study's goals and the Capability Approach. This method enabled systematic data collection from a large sample, allowing an exploration of common patterns in graduates' views on the curriculum's effectiveness. This is important when examining the

lack of capabilities within a specific sample (Neuman, 2020). Additionally, quantitative methods ensure statistical accuracy, leading to reliable and objective results that can inform policy, improve the curriculum, and increase graduates' opportunities—an essential part of Sen's framework. Furthermore, the quantitative approach also supported using descriptive data to measure how much participants agreed or disagreed with statements about WIL, industry recognition, and job-searching skills, which closely relate to the article's sub-research questions and Sen's concepts of conversion factors. The quantitative design, aligned with Sen's Capability Approach, emphasizes how social and environmental barriers restrict graduates' freedoms, providing empirical evidence to advocate for curriculum changes that enhance job readiness and entrepreneurial capacity, ultimately promoting broader economic growth (Sen, 1999; Bahl & Dietzen, 2022).

RESEARCH SAMPLING

210 NC(V) engineering graduates were identified from the three colleges' former students' electronic database, and a total of 94 unemployed NC(V) engineering graduates participated in this study. A total of 40.4% (n=38) were females, and 59.6% (n=56) were males. 26.6% (n=25) were from the Electrical Infrastructure and Construction programmes, while 30.9% (n=29) had done Civil and Building Construction. A further 42.6 (n=40) specialised in the Engineering & Related Design programme.

RESEARCH INSTRUMENT

A self-designed, online Likert-type questionnaire instrument was used. Questionnaire surveys are a great and efficient research technique that utilises structured questionnaire instruments for collecting data from a large population. Questionnaire surveys are commonly used to assess attitudes and opinions among others (Babbie, 2021). The survey was selected for its capacity to effectively gather data from an expansive, geographically spread cohort of jobless NCV engineering graduates, linking with the quantitative approach's strong focus on standardised procedures and potential for generalisation (Mokhothu & Callaghan, 2024). The use of a survey can overcome this limitation. Although this strategy is particularly effective in obtaining large amounts of data, low response rates to questionnaires may reduce its impact. The self-designed questionnaire was first piloted to improve the adequacy, appropriateness, and clarity of the instruments as well as to promote their completeness, as recommended by Neuman (2020). The questionnaire consisted of 31 items, divided into five sections. Section A collected biographical data, while Section B addressed curriculum issues. Sections C and D focused on the workplace and the recognition of engineering graduates by the engineering industry, as well as job searching and interview management skills, respectively. Cronbach's alpha was used to test the internal consistency and reliability of the questionnaire, and the results showed a Cronbach's alpha of 0.776, indicating high reliability (Babbie, 2020).

DATA ANALYSIS

A purposive sampling strategy was applied to choose 210 unemployed NC(V) engineering graduates from the computerised records of three public TVET colleges in Gauteng, South Africa. There were 94 participants (40.4% females and 59.6 males), with 26.6% in Electrical Infrastructure and Construction, 30.9% in Civil and Building Construction, and 42.6% in engineering and related design. Descriptive statistics were used to analyse the data, yielding mean scores and standard deviations for each questionnaire item (Tables 1-3). This method evaluated graduates' views, allowing for an estimation of capability challenges such as a lack of WIL (72.2% disagreement) and insufficient industry recognition (69.5% disagreement). Descriptive statistics were selected for their potential to effectively summarise huge data sets and highlight patterns, advancing the Capability Approach's emphasis on using empirical evidence for analysing freedoms and opportunities (Creswell & Creswell, 2023).

ETHICAL CONSIDERATIONS

Ethical consideration in research implies the moral principles of managing and controlling the entire research process (Govil 2013). By extension, it requires those who conduct studies to commit to the principles of the process and ensure that fair conduct is exercised at all times. In the context of this study, a research approval letter was obtained from the UNISA Research Ethics Committee, and Certificate Ref # 2018/06/13/48174947/27/MC was granted. All participants were given access to the ethics clearance certificate

and informed of their rights to withdraw at any research stage. The researchers also adhered to the confidentiality clause of the ethics clearance certificate, and no participant was required to indicate their name.

FINDINGS /RESULTS

The findings of this study are summarised in Tables 1, 2, and 3. Table 1 depicts data relating to unemployed graduates' views on whether the TVET engineering curricula accommodate authentic WIL practices in the engineering industry (SRQ1). The section focused on, among other aspects, the graduates' views on the engineering programme's structure and pacing, assessing whether students engage in real, authentic learning in the industry.

As shown in Table 1, 47.9% and 24.3 % of the unemployed NC (V) engineering graduates disagree and strongly disagree respectively, giving a total of 72.2 % of the unemployed engineering graduates who argue against the view that the NC(V) engineering curricula in South African TVET colleges does not accommodate authentic WIL practices. Only 4.4 % stated they were uncertain, whereas 22.3 percent of the graduates felt otherwise (mean 2.7; SD= 0.9). Also, 44,9 per cent disagreed with the statement that said that the NC(V) engineering programme prepared them for entrepreneurship adventures, with 1.1 % of them strongly disagreeing with the statement (Mean= 3.1; SD= 0.9).

However, 23.4 % and 7.4 % of the participants agreed and strongly agreed with the statement, respectively, implying that they felt that the engineering programme offered in South African TVET colleges prepared them adequately for entrepreneurship opportunities.

Table 1. The extent to which the engineering curriculum prepared students for the labour market

To what extent do you agree or disagree that the NC (V) engineering curriculum accommodates WIL practices?			Five-point scale on the extent of agreement/disagreement				
	Mean	St.De v	SA (%)	A (%)	U (%)	D (%)	SD (%)
The programme prepared me adequately for entrepreneurship opportunities	3.1	0.9	7.4	23.4	7.2	45.9	16.1
Engineering subject content applies to my employment prospects	3.8	0.7	13.8	58.5	5.5	12.1	10.0
Learning and teaching resources for the programme are relevant	3.3	1.1	16	30.9	7.7	33.3	12.1
The quality of lectures received is good	3.7	0.9	17	46.8	1.3	19.9	15.0
The structure and pacing of the curriculum accommodate WIL practices in the workplace	2.7	0.9	1.1	22.3	4.5	47.9	24.3
Lecturers apply consistent & and fair assessment practices in the course	4.0	0,7	25.5	45.7	8.0	9.0	11.8
The practical assessments given at the college	3.7	0.68	13.8	48.9	9.8	7.4	20.0

are relevant to industry							
Theoretical assessments given at college are relevant to the industry	3.5	0.9	12.8	40.4	6.0	13.8	27.0

Notes: n=210 Likert scale: SA, strongly agree; A, agree; U, uncertain; D, disagree; SD, strongly disagree.

The recognition of the NC (V) programme from public TVET colleges by the engineering industry is analysed in Table 2. Concerning sub-research question two (SRQ2), the unemployed NC (V) engineering graduates' views were elicited on the extent to which the engineering industry recognised their NC (V) qualification regarding their employment. Furthermore, the engineering industry's attitude towards employing NC (V) engineering graduates from public TVET colleges was also determined. As indicated in Table 2, 35.5 % of the NC (V) engineering graduates strongly disagreed while 34 % disagreed, giving a combined total of 69.5 % (mean=2.4; SD=1.2) of the graduates who felt that the engineering labour market did not recognise their qualifications regarding employment. On the other hand, only 13.8 % and 6.4 % agree and strongly agree, respectively, that the engineering companies recognise NC (V) engineering graduates. This gives the study a combined total of 20.2 % of the participants who felt that the engineering labour market recognises the NC (V) engineering qualifications, in contrast to a total of 69.5 % who felt that the engineering industry market does not recognise the NC(V) engineering qualifications. Approximately 10.2 per cent of the participants indicated that they were uncertain.

Table 2. Workplace competence and recognition by the engineering industry

To what extent do you agree or disagree with the following statements regarding the recognition of the NC (V) engineering programme by the engineering industry?			Five-point scale for the extent of agreement/disagreement				
	Mean	Stand Dev.	SA (%)	A (%)	U (%)	D (%)	SD (%)
I am practically competent	3.7	0.8	16	44.7	7.0	6.8	25.5
I have adequate workplace experience	2.6	1.1	3.2	24.5	7.5	45.7	18.6
I am in a good state of workplace readiness	2.4	1.2	7.4	39.4	2.9	22.3	28.0
Industry employers' attitude towards NC (V) engineering graduates	3.3	0.9	5.3	14.9	8.1	34	37.7

Engineering companies recognise NC (V) qualifications from public TVET colleges	2.4	1.2	6.4	13.8	10.2	34	35.5
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Notes: n=210 Likert scale: SA, strongly agree; A, agree; U, uncertain; D, disagree; SD, strongly disagree.

In Table 3, the views of the unemployed NC (V) graduates on the extent to which the engineering programme prepared them in job searching and interview management skills. As shown in Table 3, 38.3% and 25.3 % disagree and strongly disagree respectively, that the engineering programme prepared them in job searching skills, giving the study a combined total of 63.6 per cent (mean= 2.9; SD= 1.1) of the participants who felt that the NC(V) engineering programme did not prepare them in job searching skills. Additionally, a combined 65.8 % (mean=2.9; SD=1.2) indicated that the NC(V) engineering programme did not prepare them for job interview handling skills. However, a combined 28.8 % felt that the NC(V) engineering programme prepared them in job interview handling skills, while a further 5.4 % were uncertain about whether the programme developed them in job interview handling skills or not

Table 3 Job searching skills and further learning pathways

To what extent do you agree with the following statements related to job searching and interview skills?			Five-point scale for the extent of agreement/disagreement				
	Mean	Stand Dev.	SA (%)	A (%)	U (%)	D (%)	SD (%)
The NC (V) engineering programme prepared me for possible job markets and further learning pathways	2.8	1.5	16	22	3.4	26.4	31.9
NC (V) engineering graduates are accessing the job market relatively easily	2.7	0.8	0	19.1	6.2	42.6	32.1
After completion of the NC (V) programme, further learning pathways are available for us to pursue degree programmes at the university	3.4	1.1	19.1	26.6	5.0	28.7	20.5
University institutions are accessible to NC (V) engineering graduates	3.4	0.8	2.1	47.9	3.0	16	31.0
The programme prepared me for job-searching skills	2.9	1.1	6.4	26.6	3.4	38.3	25.3
The programme prepared me for job	2.9	1.2	12.8	16	5.4	40.4	25.4

interview handling skills							
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Notes: n=210 Likert scale: SA, strongly agree; A, agree; U, uncertain; D, disagree; SD, strongly disagree

DISCUSSION

This study examined whether the South African NCV engineering curriculum in Technical and Vocational Education and Training (TVET) colleges adequately prepares graduates for employment and entrepreneurial opportunities, employing Amartya Sen's Capability Approach as a theoretical lens. According to Sen's framework, training should improve individuals' capabilities, as well as their real prospects for acquiring work or start their own businesses, while also taking into account the influences of society and the environment (Sen, 2020). A novel finding in Table 1, is there is significant capability deprivation, with 72.2% of unemployed NCV engineering graduates claiming that the curriculum does not support authentic Work-Integrated Learning processes (mean=2.7; =0.9), perceiving a lack of industry recognition for their qualifications ((Kana & Letaba, 2024). This affirms earlier works of Mitchell, et al, (2021), Fisher & McGhi, (2023), and Wedekind (2021) as well as studies of Bahl & Dietzen, (2022) which conclude that authentic workplace experience is of utmost importance for any engineering curriculum and also that vocational training linked to the workplace creates better job opportunities for its graduates and employers acknowledge and trust such models. Notwithstanding, it is interesting to note that about 23.3. per cent of the unemployed NC (V) engineering graduates felt otherwise. Admittedly, this finding is rather surprising, hence, a difference between the graduates' perceptions could be attributed to their failure to distinguish between Work-Based Education (WBE) and Work Integrated Learning (WIL). Alternatively, it may be that these graduates benefited and excelled in the theoretical knowledge offered in TVET colleges and then thought that was enough for them to be employable. On the contrary, UNESCO (2022) argues that theoretical information alone is not enough in a vocational curriculum in engineering. The findings cast a new light on what curriculum planners and other stakeholders should focus their attention on regarding the review of the NC(V) engineering curriculum in South African public TVET colleges.

Our findings in the second research question reveal that most of the unemployed NC(V) engineering graduates; about 34 % and 35.5 % (See Table 2 disagree and strongly disagree, respectively, that the engineering industry employers recognise, NC(V) qualifications from public TVET colleges in South Africa (mean=2.4; SD=1.2). Closely linked with a lack of recognition, it is interesting to note that the unemployed engineering graduates perceive that the engineering industry's attitude is not welcoming towards the NCV engineering graduates. This is evidenced by a combined percentage of 71.7 % who stated that the engineering industry has a negative attitude towards them. This demonstrates a social conversion barrier, as employer biases and social stereotypes inhibit graduates' potential to convert qualifications into employment (Sen 1999). This also confirms the conclusion from the previous works of Allais (2022), which observes a poor perception of TVET college graduates and considerable labour market and societal prejudice. The latter is further corroborated by Sibiya et al. (2021)'s assertion that job advertisements in the South African media space rarely mention a TVET qualification as an alternate qualification, giving it less value. According to Sen, the lack of recognition hinders graduates' potential to execute valued functions, thereby exacerbating unemployment and inequality in society. This is probably because, during their training, they spend less time with the employers in the industry. This is consistent with the conclusions of Wedekind (2018) and those of Wheelahan et al. (2016), which reiterate the view that engineering industry employers tend to welcome products of training that are closely linked to the workplace. Therefore, it is not surprising for NC (V) graduates to encounter such experiences, given the extent to which the NC(V) engineering curriculum in public TVET colleges is detached from the engineering industry in South Africa. Our argument also relies heavily on the relative success of the dual TVET model practised in countries such as Germany, Austria, Switzerland, Denmark, and Norway. This type of vocational training supports apprenticeship and on-the-job training while encouraging inclusivity through a public-private partnership. It generates TVET graduates with in-demand skills and leads to a high rate of graduate employment (Bahl & Dietzen, 2022).

The third research question was developed to assess the extent to which the NC(V) engineering curriculum prepares its graduates for job searching and interview management skills. In Table 3, it is found that 38.3 % and 25.3 % disagreed and strongly disagreed, respectively, with the statement that the NC(V) engineering curriculum prepared them in job searching skills (mean=2.9; SD=1.1). In addressing the extent to which TVET colleges prepared their graduates in job searching and interview management skills, a combined 65.8 % disagreed that

they were trained in interview management skills (mean=2.9; SD=1.2). The outcome is consistent with Umalusi's (2022) assessment report, which established that some of the Level 4 NC (V) assessments sampled fell short of the required standards; on the other hand, the content was not representative of the most recent advancements in those particular fields. It seems possible that these results are due to a lack of dynamism that seems to characterise the NC(V) engineering curriculum. From a Capabilities Approach, this gap in soft skills training limits graduates' agency, preventing them from actively pursuing desired outcomes. The Canadian e-apprenticeship approach, which integrates computerised strategies and workplace training (Little, 2021), provides an insightful comparison, indicating that novel strategies promote graduates' capacities. A popular narrative is that not only does a vocational curriculum require links with the workplace, but it also needs student-centred and dynamic education that can also develop holistically ideal future engineers, just as other countries like Canada do by integrating technology and introducing the concept of e-apprenticeship training (Guerra & Rodriguez, 2021).

CONCLUSION, IMPLICATIONS, AND SUGGESTIONS

Our findings have far-reaching implications for developing TVET education in South Africa and globally. They contribute in several ways to our understanding of the NC (V) engineering curriculum offered by South African public TVET colleges as perceived by their unemployed graduates. In this study, we demonstrate that the current curriculum for NC (V) engineering programmes in South Africa does not effectively equip students for careers in the engineering sector. Consequently, this discovery confirms and extends the findings of other literature reports by Allais, (2020) and Mthethwa and Ndebele, (2022), which demonstrate systemic shortcomings in TVET, by providing empirical evidence from graduates' perspectives on a relatively understudied space. In addition, NC (V) engineering graduates expressed dissatisfaction that South Africa's engineering industry does not consider them suitable for employment. The study results also indicated that NC (V) engineering graduates do not have well-developed skills in job hunting and interview management. One of the most significant findings from this study is the revelation that vocational graduates are stigmatised. Before this study, evidence of such was only anecdotal. Still, the findings of this study affirm such outcomes and their negative impact on the employment prospects of NC (V) engineering graduates from public TVET colleges. These insights from this study could enable policymakers, curriculum planners, provincial education officials, TVET college management and other related stakeholders to improve TVET curricula and the graduates' employment prospects. Above all, this could also spearhead global economic growth and development. Furthermore, policymakers may find it useful to review and effectively implement recruitment policies that may enhance inclusivity and consideration of all qualifications relevant to the employment context. The study's unique contribution is also its pragmatic shift from employing the usual conventional human capital theories when focusing on skills acquisition to the novel use of the Capability Approach to redefine TVET transformation as an expansion of freedoms. To spearhead and influence societal awareness as well as meaningful labour market recognition, the Department of Higher Education and Training could launch an advocacy campaign conscientising the employment industry on the relevance and significance of TVET programmes. These findings encourage curriculum planners, policymakers, and TVET constituents to incorporate an authentic Work Integrated Learning framework, soft skills training, and updated industry-specific content. Implementing dual TVET models, like those in Germany, and advocacy campaigns to enhance recognition within the engineering sector could enhance graduate employability, reduce industry and societal prejudice, and promote inclusive employment and economic growth.

LIMITATIONS

Although this study assisted in understanding how NC(V) engineering graduates perceive their recognition by the engineering industry, its findings cannot be generalised as the paper does not engage with TVET graduates from all programmes. Consequently, further research comprising a larger sample, including other programmes from the humanities and business studies, should be undertaken to investigate how TVET graduates perceive their recognition by the employment industry. Probably, different conclusions may be generated. Also, the research approach used was quantitative; perhaps future research may use a mixed research approach to augment the quantitative research approach.

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- **AUTHOR'S CONTRIBUTIONS**

This research was conducted and written by Nicholas Ndlovu

- **AUTHOR(S) NOTES**

Dr Nicholas Ndlovu is a holder of a PhD in Education and is a lecturer at South West Gauteng TVET College in Johannesburg, South Africa. His research interests include inter alia, Curriculum issues, particularly in TVET education, Assessment, Andragogy, Pedagogy, and Work-Integrated Learning (WIL).

- **DATA ACCESSIBILITY STATEMENT**

During research, data were securely stored, and participants remained anonymous

- **ETHICS AND CONSENT**

For this study, a research approval letter was obtained from the UNISA Research Ethics Committee, and Certificate Ref # 2018/06/13/48174947/27/MC was granted. All participants were given access to the ethics clearance certificate and informed of their rights to withdraw at any research stage. The researcher also adhered to the confidentiality clause of the ethics clearance certificate, and no participant was required to indicate their name.

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- **COMPETING INTERESTS**

The author declares no potential competing interests or biases that may have influenced this research.

- **AUTHOR AFFILIATIONS**

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