

A CALL FOR MORE ENTREPRENEURSHIP EDUCATION IN NON-BUSINESS PROGRAMS AT SOUTH AFRICAN TVET COLLEGES

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Abstract

There has been an increase in the number of unemployed Technical and Vocational Education and Training (TVET) graduates even though these institutions are meant to train students for a particular job, several employment opportunities or self-employment. While proactive higher learning institutions acted on the need to equip graduates with entrepreneurial skills, others have not. More concerning is that even those who do not include entrepreneurial education in their curricula expect their graduates to be self-employed if they cannot find employment upon graduation. This article ascertained the extent, to which TVET colleges equipped their graduates for self-employment by including entrepreneurial skills in their programmes. Grounded on the contingency organizational theory, this article ascertained the necessity to incorporate entrepreneurship education in non-business programmes at TVET colleges. Data was collected from the TVET colleges, websites, brochures and documents of all the public TVET colleges in South Africa. The findings indicated that only 42 % of the programmes offered entrepreneurship education in their curricula. Moreover and interestingly, the province with the highest prevalence of entrepreneurship education (49 %) in their programmes is Limpopo and not the Western Cape, the financial capital. Consequently, there is a vital need to implement entrepreneurship education in all non-business programmes, for it may increase business start-ups, innovation and improve on the employability rate of the graduates.

Keywords: Entrepreneurship education, Entrepreneurial skills, TVET Colleges, South Africa.

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1. Introduction

In recent years, innovation, ingenuity, and flexibility have become increasingly valued in the labour market [1–3]. These entrepreneurial traits support the increasing demand for individuals with entrepreneurial abilities in the labour market. Entrepreneurial competencies, such as critical thinking, problem-solving, communication, leadership, and risk management, are desirable and necessary in various occupations and sectors, including healthcare, engineering, agriculture, hospitality, and information technology [1]. It is widely accepted, that entrepreneurship and innovative thinking are essential to every nation's economic development [4–9]. Therefore, Technical and Vocational Education and Training (TVET) colleges must invest in implementing entrepreneurship education in all their courses [10]. In today's economy, more and more people are choosing to start their businesses, and entrepreneurship education can help them succeed. Entrepreneurship education can help students develop the skills and knowledge they need to start their businesses and succeed in the economy of the 21st century.

TVET colleges play a vital role in transferring hands-on skills, required in the industry, to graduates. However, some researchers argue that the training, offered at TVETs, does not align with the current market needs within the fourth industrial revolution (4IR) [11, 12]. As a result, stu-

dents need to be trained to meet the demands of the 4IR workplace. In addition, entrepreneurship education can help students develop a sense of social responsibility. When students learn about the importance of entrepreneurship, they are also learning about the importance of creating jobs and economic opportunities. This can help them become more engaged citizens and contribute to the development of their communities [13, 14].

In South Africa, youth unemployment has been rising, affecting high school, college, and university graduates. The labour market remains volatile for young people (15–34), with a 46.5 % unemployment rate in that age range in the second quarter of 2022 [15]. Entrepreneurship has been hailed as a potential pathway for graduates who cannot find employment [7, 9, 16]. However, while TVET institutions are intended to prepare students for a specific job, many career prospects, or self-employment, the number of unemployed graduates has increased [17].

Some researchers [18] performed a nationwide study to analyze the progress of entrepreneurship education in South African higher education institutions (HEIs). They [18] concluded that the program's content and methodology do not produce the expected results. While proactive higher learning institutions acted on the need to equip graduates with entrepreneurial skills, others have not. Worryingly, even institutions that do not include entrepreneurial education in their curricula expect their graduates to be self-employed if they cannot find employment upon graduation [19], and this comes at a time when vocational education cannot adequately compete in the free labour market [20]. Moreover, [21] contends that there is a need to enhance the present techniques of entrepreneurship instruction in non-business disciplines at South African TVET colleges. In a more recent study, [21]'s call was re-echoed by [22].

Therefore, this study explores the prevalence of entrepreneurship education in non-business programs in South African TVET colleges. We assess how these institutions prepare graduates for self-employment by teaching entrepreneurial skills and offer suggestions accordingly. By reviewing the status of entrepreneurship education in non-business programs at TVET colleges, this study highlights the need for further investment in entrepreneurship education across all courses to equip graduates with the skills necessary for success in the labour market.

1. 1. Literature Review

Entrepreneurship education

Entrepreneurship education aims to cultivate entrepreneurial skills and attitudes through formal or unstructured learning experiences [23, 24]. Many would agree that entrepreneurship education is essential in all disciplines in all tertiary education, including TVETs. Essentially, researchers like [10, 8, 25, 26] concur that entrepreneurship education prepares learners to have an entrepreneurial mindset, thus triggering entrepreneurial intention. Even so, entrepreneurship education extends well beyond conventional business studies, covering such topics as opportunity recognition, business plan creation, marketing, managing money, and interpersonal communication.

Education in entrepreneurship has been demonstrated to provide various advantages for students. According to [27], entrepreneurship education helps students develop a proactive and inventive attitude, pushes them to take chances, and prepares them to be resilient in the face of adversity. In today's dynamic workplace, individuals must be able to adapt to changing conditions and take calculated risks in order to be successful. Moreover, [28] observed that entrepreneurial education encourages creativity, critical thinking, and problem-solving skills. These skills are vital for success in any sector because they enable individuals to generate creative solutions to complex challenges. Overall, entrepreneurship education is a worthwhile investment for students since it gives them the skills and mentality, required to flourish in today's fast-evolving world [27, 28].

With unemployment and poverty on the high side, it is vital to train students to have a self-sufficient mindset [10, 29]. This would enable them to survive, succeed and excel in whatever disruptive environment, like that of the 4IR. Entrepreneurship education is no longer for Business majors anymore. All other disciplines can integrate entrepreneurship education into their programmes [7, 10].

Entrepreneurship

Entrepreneurship is the backbone of every economy. Entrepreneurship is the creation of innovative solutions. There is a growing consensus that entrepreneurship can be taught or stimulated [30–32] (Kunene, 2008; [30] James (2012), [31] Gibb, Haskins, Hannon and Robertson (2012) [32]. The entrepreneurship mindset is vital for innovation and creativity in whatever industry the individual is in [7, 8]. While many have urged for entrepreneurship to be taught to all students, [21] contends that the existing methods of entrepreneurship teaching in non-business disciplines at South African TVET institutions must be improved. Overall, entrepreneurship education is a valuable investment that can help students succeed in life and contribute to the economy.

TVET Colleges

TVET colleges, as a higher education institution, offer technical, vocational, occupational and artisan education and training to its students. Essentially, students are trained towards specific professions or self-employment in their core discipline. Another route will be for the students to get admission into a university or a university of technology to further their studies. South Africa has fifty public TVETs with over 364 campuses in both urban and rural areas. The hallmark of TVETs is to train students in their specific disciplines' technical and vocational know-how, [13] concur that TVET colleges prepare the students for practical trades and industry ready and employable. The question is whether these TVET institutions prepare these students to face the demands and challenges of the Fourth Industrial Revolution. Some researchers agree that within TVET colleges, there is a misalignment between curriculum reforms, student type and lecturer adaptability to change [14, 17]. This article examines how TVETs incorporate entrepreneurship education across all disciplines and how equipped students are for 4IR entrepreneurship.

The Public TVET colleges in South Africa provide a platform whereby top students can engage with the marketplace through job shadowing at companies or workplace internships. While this effort is applaudable, it should not be limited to only top-performing students but all students. It is also worth noting, that many TVETs create an atmosphere that simulates what is being done in the industry to expose their students to practical skills in their field of study [10].

Theoretical Framework

This paper is grounded on contingency organizational theory. This theory demonstrates that the ideal way to run an organization is to have contingency plans based on the internal and external environment. As a result, TVET institutions need concrete backup strategies, such as including entrepreneurship education in all the programs, given to students, to ensure their students graduate with the necessary entrepreneurial skills.

The contingency organizational theory suggests that institutions operate within their strengths and opportunities. Therefore they can adapt in the case of any change in their immediate environment [32]. The contingency organizational theory emphasizes that contingent is an optimal plan of action for any institution to achieve its goals based on its internal and external environments. The contingency organizational theory calls for TVETs' programmes to be aligned to meet the demands of the industry. Researchers like [33] suggest that the curriculum of the TVET colleges is bound to change to improve the employability, productivity and success of TVET graduates. He also advocated that the TVET colleges lack leadership programmes to assist leaders in bringing about curriculum change [33]. Some researchers like [34–36] posit that TVET colleges cannot build a credible and comprehensive skills system for development to support individuals, communities and organizations. On a positive note, [36] highlights that a transformed and transformative Vocational Education and Training -VET for Africa is possible. This will also mean that TVETs contribute to economic growth, employment and alleviation of poverty by creating enterprises and jobs. This theory benefits higher institutions because institutions will learn and adapt from their errors resulting in better management of future situations.

The TVETs will have to evaluate their strengths and weaknesses and see how entrepreneurship education could be incorporated into all its programmes. A proposed structural means of providing entrepreneurship education to non-business programmes will be utilizing the radiant

model, proposed by [37]. The radiant or decentralized model allows each programme to offer entrepreneurship or Business studies courses. In contrast, the magnet or centralized model allows for entrepreneurship education by a central body like the business unit or department. The radiant model is recommended in that business studies or entrepreneurship education could be included in all the departments of the TVET colleges. Researchers agree that graduates should be able to be self-reliant to create businesses irrespective of the courses they studied. Thus they should be able to create business ventures in their field of study.

The aim of the research was to ascertain the necessity to incorporate entrepreneurship education in non-business programmes at TVET colleges. This study determined the extent, to which TVET colleges equipped their graduates for self-employment by including entrepreneurial skills in their programmes.

2. Materials and Methods

As part of desktop research, data was collected from the internet and websites of the public TVET colleges in South Africa and other documents relevant to the study. Only public TVET colleges with a web presence were considered. The various programmes' course outlines and career pathways were reviewed to find the presence of entrepreneurship education. This paper uses the content analysis method to review the literature. Many researchers have used content analysis, considered one of the approaches to collect valid and purposeful data for new insights for academic and business audiences [38, 39]. This paper also consulted existing literature from publications and journals, such as Scopus, Science Direct, Google Scholar, EBSCO Host and ProQuest. Keywords like entrepreneurship education, TVET and entrepreneurship education, entrepreneurship and skills development were used to search for related literature.

The unit of analysis was the fifty Public TVETs spread across the nine provinces in South Africa. The study investigated the programs, offered at these TVETs, in order to identify the prevalence of entrepreneurship-related subjects. At the end of the research, the following subjects were identified; business management, business studies, entrepreneurship, business practice, entrepreneurship and business management, agric-business, salon business management, music business and new venture creation across the programmes, offered at the public TVETs. Our investigation focused on the National Certificate Vocational (NCV) programmes from levels N1 to N6. This is so because in the NC (V) Qualification, students gain both theory and practical knowledge and skills. A simulated or real workshop environment is being created for the students to gain these practical experiences.

Higher institution graduates, such as universities and TVET colleges, play an important role in skills supply and economic growth. A skilled labour force is required for product development and innovation, product design, and enterprise creation. TVET colleges thrive in producing technically qualified graduates that can apply technical knowledge and technical know-how but lag in producing entrepreneurial savvy graduates. With the advent of the 4IR, new graduates must be equipped to thrive in the 4IR era. Therefore soft skills, people skills and entrepreneurial skills are necessary for these recent graduates. These are more or less generic skills that will cut across all disciplines. Hence the need for entrepreneurship education in all the programmes in TVET colleges. Technical skills are essential, but these skills should be complemented with soft and entrepreneurial skills [30, 40] in order to instil in the graduates an innovative and entrepreneurial mindset even within an organization.

The TVET websites and brochures were scanned for programmes that contained entrepreneurship or business management as part of the course content. Programmes that indicated that self-employment or entrepreneurship was one of the career pathways were also scanned to see if entrepreneurship or Business management as a subject is included in the course programme. Upon noting a course with entrepreneurship in its course title and description, this programme was marked as offering entrepreneurship education.

The findings are presented in the next section. The sampled TVET colleges in the nine provinces are labelled from TVET 1 to TVET 50.

3. Result

The results are presented and analyzed on a province-by-province basis.

Eastern Cape: TVET 1 to TVET 8

The Eastern Cape Province has eight TVET colleges. TVET1 has thirty-two courses, spread across three programmes on various campuses. The programmes range from Engineering to Business to Occupational Training. Some of the courses include motor mechanics, welding, electrical and end-user computing. Among these thirty-two courses, ten offered have evidence of entrepreneurship education, offered in the Business programme and some of the Occupational Training programmes like Pastel Accounting and New Venture Creation. There is no evidence of entrepreneurship in the Engineering programmes. Hence TVET 1 has 31 % evidence of entrepreneurship education being offered and is the 2nd highest percentage in the Eastern Cape as shown in **Table 1**.

Table 1 indicates that the highest evidence of entrepreneurship education in Eastern Cape Province TVET colleges is 54 %, seen in TVET 2 and TVET 6. Entrepreneurship education was present in the Business Programmes and some occupational and vocational training courses like Furniture Making. The engineering programmes had no evidence of any Business or entrepreneurship training in their curricula.

Among the nine provinces, the Eastern Cape Province is ranked 7th in the presence of business or entrepreneurship education within the courses, offered at the public TVET colleges in the province. A total of 206 courses are offered in the Public TVETs in the province, with only 76 (37 %) of those courses having evidence of entrepreneurship or Business practice, offered in their curriculum (**Table 1**).

Free State: TVET 9 to TVET 12

The Free State has four TVET colleges, and these colleges rank 3rd in the prevalence of entrepreneurship education in their courses. As shown in **Table 1**, a total of 45 % of the courses are entrepreneurship education inclined. For example, TVET 8 had a total of 63 % entrepreneurship presence in their courses. TVET 8 offers courses in the following programmes: Business, Engineering and Learnership and skills. Evidence of entrepreneurship education is found in some courses. For example, Business practice is one of the Electrical infrastructure and Construction Course subjects. Business Management is also one of the subjects in the Educare Course.

Gauteng: TVET 13 to TVET 20

The Gauteng province boasts of having 8 public TVET colleges. These TVET colleges offer Business, Engineering, Information Communication Technology and Utility studies programmes. Business studies or entrepreneurship education was found in 45 % of the courses. Most of their courses have entrepreneurship in the form of Business practice, Business Management. Within the Gauteng province, TVET 15 ranks top at 63 % in the embeddedness of entrepreneurship education in the programmes offered. Overall, Gauteng ranks 5th in South Africa in the inclusion of entrepreneurship education in their TVET colleges (**Table 1**).

KwaZulu Natal: TVET 21 to TVET 29

KwaZulu Natal has the highest number of Public TVET colleges (9 TVETs). Five of the nine TVETs provide entrepreneurial instruction in above 50 % of their curricula (**Table 1**). Thus the province becomes the second to incorporate entrepreneurship education across most courses its TVETs offer. The province's TVETs offer programmes in Business, Engineering, Agriculture, Information Technology (IT) and computer sciences and Learnership and skills. A few courses in Engineering have the presence of Entrepreneurship in the form of professional practice, Business practice. There was evidence of some Business or entrepreneurship education across all the programmes, offered at the TVETs in the province. Some of the entrepreneurship subjects included new venture creation, Business practice, Agri-business, and Business studies for IT students.

Limpopo: TVET 30 to TVET 36

Limpopo province has seven TVET colleges, and it is ranked the 1st province to have a majority of entrepreneurship education across most of the courses, offered at the TVET colleges. The seven TVETs in the province of Limpopo offer 121 courses, 59 of which include some form of entrepreneurship instruction. In **Table 1**, there is a 49 % prevalence of entrepreneurship education at TVETs in Limpopo. Four of the seven TVET colleges in this province have above 53 % entrepreneurship education visibility in their programmes. TVET 30 and TVET 32 scored the highest percentage of visibility, with 63 % of entrepreneurship education presence in their courses. Entrepreneurship education is even present in the Arts and Humanities department in the form of Music Business. Other subjects present includes Entrepreneurship and Business Management for the Hair Care course. This is remarkable however there is a need for improvement to embed entrepreneurship education in all its programmes.

Mpumalanga: TVET 37 to TVET 39

In **Table 1**, the Mpumalanga province has three Public TVET colleges, and 37 % of entrepreneurship education is offered at these TVET colleges. It is still the lowest percentage amongst all the TVETs. They offer courses in Engineering, Business, Agriculture and IT. There is no evidence of entrepreneurship in all engineering and IT courses. There was some evidence of entrepreneurship education in the other programmes like Agric-business in the Agriculture course. The least percentage of entrepreneurship education prevalence was observed in Mpumalanga, TVET 37 has only 14 % entrepreneurship education embeddedness in their programmes

Northern Cape: TVET 40 to TVET 41

The Northern Cape has the least number of Public TVET colleges (2 TVET colleges). These two TVETs have 45 % visibility of entrepreneurship education in their courses. As shown in **Table 1**, this ranks the province 3rd in including entrepreneurship education in their curriculum. The TVETs in the Northern Cape offer courses in the following: Business, Engineering, Information Technology, Transport and Logistics, and Natural Sciences. Though there is no visibility of Entrepreneurship Education in all the Engineering Courses, there is some entrepreneurship education in the other programmes. For example, Business Studies is a subject in the IT programme, and Entrepreneurship is a subject in the Transport and Logistics Programme,

North West: TVET 41 to TVET 44

The North West province has three Public TVET colleges, and 44 % of entrepreneurship education is offered at these TVET colleges. This ranks the North West in the 4th position in implementing entrepreneurship education at its TVETs (**Table 1**). TVET 43 has more than half of its courses offering some entrepreneurship or business management subject. They offer courses in Engineering, Business, Agriculture and IT. There is no evidence of entrepreneurship in all engineering and IT courses. There was some evidence of entrepreneurship education in the other programmes like Agric-business in the Agriculture course.

Western Cape: TVET 45 to TVET 50

The Western Cape Province is ranked 6th in the prevalence of entrepreneurship education at its Public TVET colleges. The province has six Public TVET colleges offering entrepreneurship education in 39 % of their course curriculum as shown in **Table 1**. They offer courses in Engineering, Business, Agriculture, IT, Education studies, Maritime studies, Tourism as well as Occupational programmes. There is no evidence of entrepreneurship in all the engineering courses. However, there was some evidence of entrepreneurship education in the other programmes like Agric-business in the Agriculture course, Business Studies in IT and Entrepreneurship and Business Management in Tourism.

Table 1

The prevalence of entrepreneurship education at Public TVET colleges in South Africa

Provinces	Number of TVETs	TVETs	Number of Programmes/Courses	Presence of Entrepreneurship/Business Subjects	Percentage	Ranking in terms of prevalence
1	2	3	4	5	6	7
Eastern Cape	8	TVET 1	32	10	31	7th
		TVET 2	35	19	54	
		TVET 3	29	9	31	
		TVET 4	21	6	29	
		TVET 5	17	5	29	
		TVET 6	26	14	54	
		TVET 7	23	6	26	
		TVET 8	23	7	30	
Free State	4		206	76	37 %	7th
		TVET 9	23	8	35	
		TVET 10	24	15	63	
		TVET 11	19	9	47	
Gauteng	8	TVET 12	33	13	39	3rd
			99	45	45 %	
		TVET 13	20	7	35	
		TVET 14	27	13	48	
		TVET 15	11	7	63	
		TVET 16	17	5	29	
		TVET 17	14	5	36	
		TVET 18	21	10	48	
KwaZulu Natal	9	TVET 19	21	7	33	5th
		TVET 20	20	10	50	
			151	64	42 %	
		TVET 21	12	6	50	
		TVET 22	13	5	38	
		TVET 23	8	4	50	
		TVET 24	20	11	55	
		TVET 25	6	3	50	
		TVET 26	10	4	40	
		TVET 27	19	9	47	
		TVET 28	22	10	45	
Limpopo	7	TVET 29	11	6	55	2nd
			121	58	48 %	
		TVET 30	16	10	63	
		TVET 31	19	10	53	
		TVET 32	16	10	63	
		TVET 33	22	13	59	
		TVET 34	15	4	27	
Mpumalanga	3	TVET 35	18	8	44	1st
		TVET 36	15	4	27	
			121	59	49 %	
		TVET 37	22	3	14	
		TVET 38	9	5	56	
Northern Cape	2	TVET 39	20	11	55	7th
			51	19	37	
		TVET 40	28	13	46	
Northern Cape	2	TVET 41	16	7	44	7th
			44	20	45 %	
North West	3	TVET 42	23	9	39	3rd

Continuation of Table 1

1	2	3	4	5	6	7
		TVET 43	7	4	57	
		TVET 44	11	5	45	
			41	18	44 %	4th
Western Cape	6	TVET 45	25	5	20	
		TVET 46	35	11	31	
		TVET 47	36	16	44	
		TVET 48	30	16	53	
		TVET 49	12	7	58	
		TVET 50	29	10	34	
			167	65	39 %	6th
Total	50					

Comparative analysis of South African TVET colleges

TVET colleges fall under the Department of Higher Education (DHET), with the government being their most significant stakeholder. Aside from the specialized professional support the government offers, the TVET colleges receive about 8 billion rands annually. Each region has a DHET regional office that provides specialized professional support to the provinces' public TVET colleges. These TVET colleges offer over one thousand and one courses in all the programmes. Only 424 out of the 1001 courses (42 %) indicated evidence of entrepreneurship/business studies, included in them (Table 2).

Table 2

Comparative analysis of the prevalence of entrepreneurship education in Public TVET colleges

Provinces	Number of Programmes/Courses	Presence of Entrepreneurship/Business Subjects	Percentage	Ranking in terms of prevalence
Eastern Cape	206	76	37 %	7th
Free State	99	45	45 %	3rd
Gauteng	151	64	42 %	5th
KwaZulu Natal	121	58	48 %	2nd
Limpopo	121	59	49 %	1st
Mpumalanga	51	19	37 %	7th
Northern Cape	44	20	45 %	3rd
North West	41	18	44 %	4th
Western Cape	167	65	39 %	6th
Total	1001	424	42 %	

4. Discussion

More than 70 % of South Africa's young people are currently without work due to the country's high unemployment rate. Universities and colleges, including those that provide TVET programs, must urgently find creative methods to train their students to be employers rather than job seekers. Colleges that offer technical and vocational education (TVET) have an obligation to their alumni to teach them how to start their businesses [30, 40].

A handful of these TVETs have made substantial efforts to include business studies or entrepreneurial education in non-business courses. This initiative will be crucial since graduates from disciplines other than business find it challenging to become entrepreneurs owing to their lack of business abilities. The few avant-garde TVETs have included Entrepreneurship instruction within their non-business courses.

This study reveals that TVET colleges in the Limpopo Province have over fifty-nine entrepreneurship courses across the seven TVETs in the province. Therefore this shows that forty-nine percent of these programmes have evidence of the prevalence of entrepreneurship education in their

curricula. Researchers in the likes of [7] suggest that entrepreneurship education should be made available to all students in higher education institutions irrespective of their main programme.

The objective of entrepreneurship education in higher education must be to instil students with an entrepreneurial perspective, enhance their entrepreneurial skills, and raise their entrepreneurial intent. To attain these goals, students must learn that entrepreneurship is the pathway to self-employment. Business start-ups, creativity and innovation have to be encouraged in all graduates of higher institutions, [41]. A change in the mindset of students about entrepreneurship will increase entrepreneurship amongst the youth.

Incorporating entrepreneurship into all programs at higher education institutions, including TVETs, demands the participation and commitment of all stakeholders [42, 43]. As the primary stakeholder, the government must enact policies and give resources to encourage entrepreneurship programs in all institutions.

Implications. One of the implications of this study is that TVET students, upon graduation, will find it difficult to successfully start up and run a business when they are unemployed. Another issue is that TVET programs that promote self-employment as a viable career option are likely to mislead the public and students if entrepreneurial skills cannot be gained through the programs. It is recommended that entrepreneurship be included in the curriculum of non-business subjects for the perceived employability attributes.

Limitation and scope for future research. This research was limited to Public TVET colleges in South Africa. Data was collected from the websites of these TVETs. Future research could look at the Private TVETs. This study also focused on programmes that included self-employment or entrepreneurship as a career choice upon completion. Moreover, the study was limited to the National Certificate Vocational (NCV) programmes from levels N1 to N6. This is so because in the NC (V) Qualification, students are equipped with both theory and practical knowledge and skills.

This study is limited to the face-value prevalence of entrepreneurship education in non-business programmes and how it is aligned with the curriculum. The research does not detail how entrepreneurship education should be taught. Future research should delve into how best to teach entrepreneurship education at TVETs.

5. Conclusion

It is evident from the findings, that only 42 % of the programmes at TVET colleges offered entrepreneurship education in their curricula. Just below 50 % of the programmes, offered at TVET colleges, prepare the students for self-employment. Pre-emptively, education prepares learners for employment and, at the same time, for self-employment. Therefore, entrepreneurship education at all levels will optimize graduates' self-employment chances and improve their employability.

There are several advantages to including entrepreneurship education in non-business disciplines at TVET institutions. First, it equips students with entrepreneurial skills that can be utilized across disciplines, sectors and areas [44, 45]. For instance, a nursing graduate with entrepreneurial training can establish a private clinic, whereas an engineering graduate might design creative solutions and launch a firm. Second, entrepreneurship education instils an entrepreneurial attitude that pushes students to be proactive, imaginative, and flexible, helping them handle uncertainty and grasp opportunities. Third, it promotes a culture of innovation and creativity among students, resulting in the creation of new concepts, goods, and services. This can help the expansion of the local economy and the creation of employment possibilities [46]. Lastly, incorporating entrepreneurship education into non-business programs may foster social and community entrepreneurship, in which students learn to identify and address social challenges through entrepreneurial ways, resulting in good social consequences.

It is recommended that entrepreneurship education be included in non-business disciplines, especially when they indicate that entrepreneurship is a career choice for their programmes at all higher learning institutions, including TVETs. These higher learning institutions should maintain a solid and dedicated commitment to providing entrepreneurial education to their undergraduate and graduate students through curricular and co-curricular programs [47–49]. Thus it is necessary for all students to be introduced to the basic principles of entrepreneurship through their required

core programmes. Furthermore, co-curricular experiential options will expose students to entrepreneurship clubs, business plan competitions, workshops, internships and seminars. Furthermore, this blended approach of curricular and co-curricular to entrepreneurship education could create innovative and skilled entrepreneurial graduates [5, 50].

With the low rate (42 %) of the prevalence of entrepreneurship education at TVET colleges across South Africa, these graduates may not perform effectively when it comes to creating businesses or being self-employed [51, 52]. It is highly recommended for entrepreneurship education be included in all programmes at TVET colleges. It is worth noting, that the high rate of entrepreneurship in the United States of America is essentially a result of the surplus of training centres and higher-education institutions, which offer entrepreneurship courses.

This paper advances that the embeddedness of entrepreneurship education in non-business courses will involve two phases. The first phase will include the integration of entrepreneurship education into non-business courses. Moreover, the second phase will include aligning the content and method of teaching to the non-business courses.

Conflict of interest

The authors declare that there is no conflict of interest in relation to this paper, as well as the published research results, including the financial aspects of conducting the research, obtaining and using its results, as well as any non-financial personal relationships.

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Data availability

Data will be made available on reasonable request.

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