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Evaluating the influence of entrepreneurship education (EE) on students' individual entrepreneurial orientation (IEO) in technical education, vocational and entrepreneurship training (TEVET) institutions in Zambia

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Abstract
Creating a robust entrepreneurial ecosystem requires the understanding of how individuals are orientation towards entrepreneurship and promoting their intention to engage into entrepreneurial activities. Therefore, this study aims at measuring the level of the Individual Entrepreneurial Orientation (IEO) of students in Technical Education, Vocational and Entrepreneurship Training (TEVET) institutions in Zambia and assess how entrepreneurship education (EE) course provided to the students impacts this orientation.
Quantitative data was gathered using a self-administered questionnaire using a survey involving 450 TEVET students, located in different provinces of Zambia selected using stratified random sampling. The data was analyzed using SPSS, utilizing the Generalized Linear Model (GLM).
Findings show that the levels of IEO is higher among male students than female students with a small difference between the levels that is not statistically significant ($t = 0.129$, $p = 0.904$). There is a significant gender imbalance among students in favor of male students. Additionally, entrepreneurship education (EE) course has been found to have a positive influence on student's Individual Entrepreneurial Orientation (IEO). The study further revealed that risk-taking and autonomy dimensions of Entrepreneurial Orientation (OE) has a low impact of enhancing IEO on students on average in TEVET institutions.
This study contributes to the understanding of the impact entrepreneurship education (EE) has on students' Individual Entrepreneurial Orientation (IEO) and how EE nurtures entrepreneurial mindsets and behavior among students in Zambia.

Keywords: entrepreneurial orientation (EO), individual entrepreneurial orientation (IEO), entrepreneurship education (EE), experiential learning (EL), tevet, pedagogy, Zambia

Introduction

As a developing country, Zambia need to train students who have entrepreneurial skills to promote innovativeness and contribute to the wider entrepreneurial ecosystem. This could be achieved through the development of a curriculum in entrepreneurship which could promote career and skills development needed to promote an environment that is entrepreneurial. Entrepreneurship has been seen as a great contributor to Economic development throughout the world from as way back as the early 20th century. Entrepreneurial Orientation (EO) is a vital component in the study of entrepreneurship which has been viewed mostly as an organizational level competence (Putniņš & Sauka, 2020) [47] towards firm's entrepreneurial outlook (Wales *et al*., 2020) [57].
And its construct being developed continuously (Covin and Lumpkin, 2011) [14]. EO is anchored on the three major dimensions of innovation, risk-taking and proactiveness (Covin *et al*., 2020) [57] This concept has recently been extended toward individual level (Bolton and Lane, 2012) [7] which they coined as individual entrepreneurial orientation (IEO).
The Covid-19 pandemic created great uncertainty for entrepreneurship globally.

For this reason, a need to have a clear understanding of how to promote entrepreneurial activities and remain self-sustaining as a country is vital. Globally, several Entrepreneurial Education (EE) programs have been tested and developed with the understanding that entrepreneurship can be taught which promotes entrepreneurial competences (De Sousa *et al*., 2022) [18]. Understanding what promotes EO at individual level would help to create a curriculum in entrepreneurship education (EE) which would cultivate entrepreneurial mindsets (Baggen *et al*., 2022) [4]. Entrepreneurship education (EE) programs have been integrated in national curriculums worldwide (Forcher-Mayr and Mahlknecht 2020) [21], especially in TVET (Mack *et al*., 2019; Lindner, 2018) [37, 34].

Background of the study

Youth unemployment has been a big problem for most developing countries in Africa (Oyelola *et al*., 2014; Sumaworo, 2023) [43, 52], in the middle-east (Bokhari, 2013) [9], in Russia (Salkynbayeva *et al*., 2023) [50] as well as developed countries (Papić-Blagojević and Stankov, 2024) [45] caused by the entrepreneurial potential of the youth still being underutilized. Globally, to promote this potential, education in entrepreneurship has been introduced to enhance the entrepreneurial orientation and intention to make entrepreneurship as a viable career path to solve this unemployment problem.

For this reason, many governments, including Zambia have implemented initiatives to encourage the growth of entrepreneurship through education by providing compulsory entrepreneurship education (EE) to students through education sectors such as the Technical Education, Vocational and Entrepreneurship Training Authority (TEVETA) accredited institutions in Zambia. According to Mulimbika and Karim, (2018), this initiative is in line with Zambia's development goals and Zambia's Vision 2030 which emphasizes the role Entrepreneurship would plays towards attaining the middle-income status by 2030. Vision 2030 emphasizes: "Strong entrepreneurial capabilities, self-reliant, outward looking and enterprising, where nationals take advantage of potential and available opportunities". (GRZ 2006:2).

This makes the promotion of entrepreneurship through education a cardinal intervention by most countries globally.

Research Problem

Unemployment has been raising in Zambia (Kapembwa and Kabubi, 2023) [25], with many youths and graduates depending on a few paid jobs such as the civil service provided by the government and Non-governmental Organizations (NGOs) operating in Zambia which has led many youths to remain unemployed (Mwange, 2018; Likando *et al*., 2023) [40, 35]. Entrepreneurship as a career option has seen many youths to venture into self-employment which has helped to alleviate the problem of unemployment in many countries including Zambia. The promotion of entrepreneurship has been pioneered through educational intervention by many governments. Despite the growing emphasis on entrepreneurship education (EE), there is limited empirical evidence on its effectiveness (Ghina, 2014) [23], particularly within the context of Zambia's TEVET institutions. Understanding how entrepreneurship education influences the entrepreneurial orientation of students, including traits such as innovativeness, risk-taking, and proactiveness, is crucial. This gap in knowledge forms the basis of the research problem: assessing the impact of entrepreneurship education on fostering an entrepreneurial mindset among vocational training students in Zambia.

Research Objectives

The primary objective of this study is to evaluate the impact of entrepreneurship education (EE) on the individual entrepreneurial orientation (IEO) of TEVET students in Zambia. Specific objectives include:

1. To assess the impact the Entrepreneurship Education (EE) course has on students' Individual entrepreneurial orientation (IEO) in TEVET institutions of Zambia.
2. To measure and compare the level of Individual entrepreneurial orientation (IEO) by gender among students in TEVET institutions.
3. To explore students' perceptions and attitudes towards entrepreneurship.

Research hypothesis

H1: The Entrepreneurship Education (EE) course has a positive impact on students' Individual entrepreneurial orientation (IEO) in TEVET institutions of Zambia.

H2: Students in TEVET institutions have a high perceptions and attitudes towards entrepreneurship.

H3: The levels of IEO between male and female students is different.

Significance of the Study

This research holds significant implications for educational policy and practice. By identifying the strengths and potential gaps in the current approach to entrepreneurship education (EE) in TEVET institutions in Zambia, the study provides insights that can inform curriculum development and teaching methodologies. Furthermore, understanding the impact of such education on students' entrepreneurial mindsets is crucial for fostering a culture of innovation and self-reliance, aligning with Zambia's broader economic development goals. For policymakers and educators, the findings can guide strategic decisions to enhance the effectiveness of vocational training programs in nurturing the next generation of entrepreneurs.

Review of literature

From debate of whether entrepreneurship can be taught to a more organized approach to teaching entrepreneurship by focusing on leveraging existing resources to act or focusing on effectuation, such as the Darden's rewiring approach and Rotman's operating theater classroom (Bhatia and Levina, 2020) [11] has seen the development of educational programs to promote entrepreneurship at more individual level, promoting students entrepreneurial mindset which strengthens their entrepreneurial intentions (Handayati *et al*., 2020; Mwange, 2018) [24, 41].

Individual entrepreneurial orientation (IEO)

Personal behaviors and attributes that characterizes an entrepreneurial individual are referred to as Individual Entrepreneurial Orientation (IEO). The concept of IEO has its genesis from Entrepreneurial Orientation (EO), an entrepreneurial behavior initially identified at organizational (Kollmann *et al*., 2007) [29]. IEO is defined by Teles *et al*., (2021) [55] as the ability to understand psychologically why some individuals choose to engage in activities that are

entrepreneurial and why others don't. The dimensions of (EO) have developed from only having three (3) dimensions innovation, Risk-taking, Proactiveness adding two (2) more being Autonomy, Competitive aggressiveness further developed to add Learning Orientation and Achievement Orientations (Krauss *et al*., 2005) [30]. Bolton and Lane (2012) [8], using students, developed a IEO measurement instrument and further validated it with non-students (Bolton, 2012) [7]. Greater success in entrepreneurship and being a manager has been associated with high levels of IEO (Kreiser and Davis, 2010) [31]. Studies have shown that EE promotes the level of IEO (Perez *et al*., 2024) [46].

Entrepreneurship education (EE)

Entrepreneurship education (EE) is an educational course taught in learning institutions like TEVET institutions globally which encompasses experiential learning and structured instruction aimed at developing entrepreneurial attitudes, knowledge, and skills among students (Fayolle and Gailly, 2008) [20]. EE has been seen to enhance students' entrepreneurial motives and mindset, motivating them to take up entrepreneurship as a career option (Colombelli *et al*., 2022; Lu *et al*., 2021; Saptono *et al*., 2021; Soomro and Shah, 2022) [13, 36, 51, 53]. The opportunity-based view of entrepreneurship aligns well with the objectives of Entrepreneurship Education (EE) which emphasizes the cultivation of entrepreneurial skills and traits, exploration, and identification of opportunities. In this view, Entrepreneurship is a field in business which seeks to understand how opportunities are exploited and identified (Shane and Venkataraman, 2000) [54].

Theoretical Framework

Students' self-efficacy (Bux and Vuuren, 2019) [10], entrepreneurial intention (Fan *et al*., 2024) [19], have been seen to be developed by EE. To investigate the influence of EE on students' Individual Entrepreneurial Orientation (IEO) in TEVET institutions in Zambia, this study theory of Planned Behavior (TPB), Experiential Learning theory (ELT), Social Cognitive Theory (SCT) and dimensions of Entrepreneurial Orientation (EO).

Entrepreneurial Orientation (EO) theory: A fundamental theory for understanding entrepreneurial behaviors and mindset of individuals according to Innovativeness, Proactiveness, Autonomy, risk-taking and competitive aggressiveness are the EO dimensions used to measure the student's IEO and how these traits are influenced by EE. The expectation after the exposure to EE is that the student's entrepreneurial mindset would be impacted positively.

Theory of Planned Behavior (TPB): The theory of planned behavior (TPB) developed by Ajzen, (1991) [3] posits that the behavior of individuals is driven by their intentions, influenced by attitudes, perceived behavioral control and the subjective norms. This theory could help the researcher to understand how the student's intentions are affected by EE to engage into entrepreneurship. The expectation is that EE positively influence the attitude to engage into entrepreneurship of the students by providing social support which would alter their subjective norms, equipping students with the necessary knowledge and skills which can enhance their perceived behavioral control (Krueger *et al*., 2000) [32].

Social Cognitive Theory (SCT): Social Cognitive Theory developed by Bandura, (1986) emphasizes the role played by individuals' belief in their own attitude to be able to succeed in situations called self-efficacy (Zimmerman, 2000) [59], learning by observing others through observational learning and dynamic interactions between the environment, the individual and their behavior to form what is called reciprocal determination. SCT was utilized to explore how students learn from role models and how it influences students' entrepreneurial self-efficacy.

Experiential Learning Theory (ELT): This theory centers its emphasis on learning being a transformation of experience to create knowledge (Kolb, 2014). The theory explains experience as the engagement into new situations or experience known as concrete experience, reflecting on these experiences using different perspectives called reflective observation. The importance to experiential learning was highlighted through the ELT using components found within EE, such as hands-on projects, business simulations and internships. These experiential learning opportunities are expected to enhance student's risk-taking abilities, practical skills, and the overall entrepreneurial Orientation through providing them with opportunities and real-world contexts to complement their theoretical knowledge (Ozaralli and Nurdan, 2016) [44].

The integration of the above theories provides a basis for understanding how EE influences the students IEO in TEVET institutions in Zambia. Through the integration of these concepts and theories, this study aims to provide an analysis of how IEO is promoted through the provision of EE using the theoretical framework illustrated in figure 1 below.

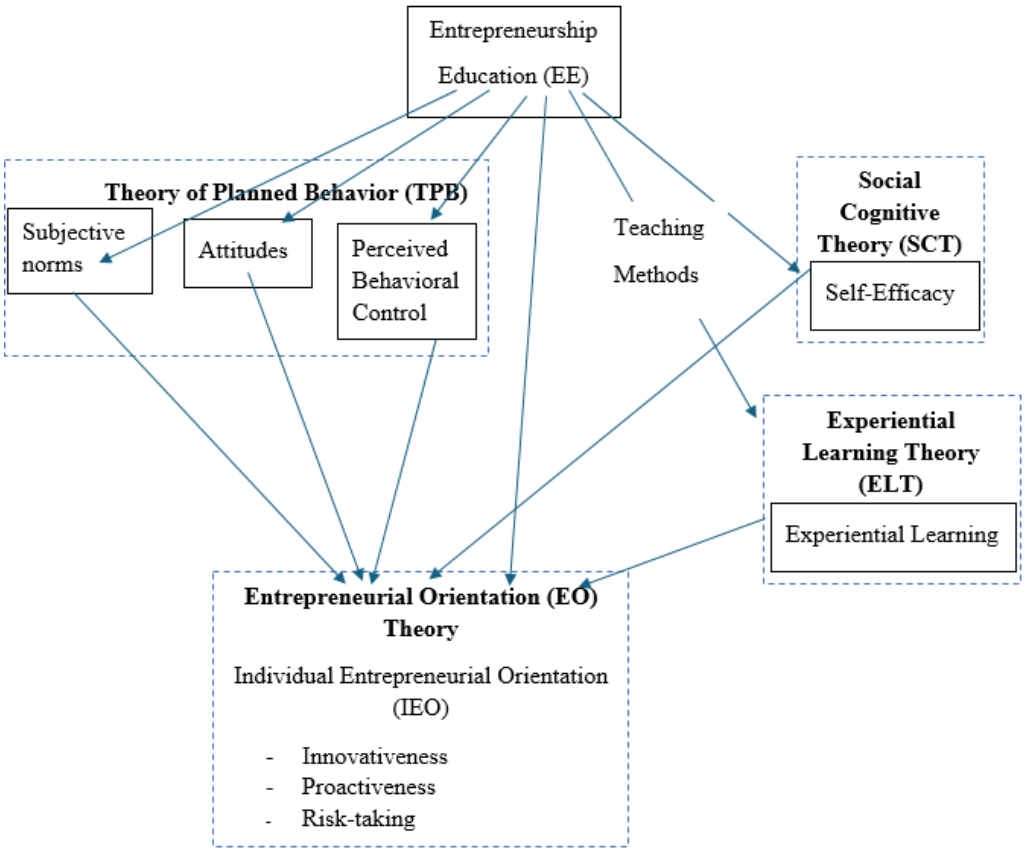

Fig 1: Theoretical framework (Developed by the author)

Methodology

The research onion model developed was adopted to align the entire research methodology. This model helped the researcher to make a series of choices when it came to creating a clear methodology and research design. The research philosophy followed in this research is positivism. Survey was used as a research strategy. The participants for this study are students from TEVET institutions in Zambia. The questionnaire for this study was developed by the researcher, benchmarked from the measurement instruments created by Bolton and Lane (2012) [8] using students, Bolton, (2012) [8] using nonstudents and Gorostiaga *et al*., (2019) [22]. The wordings and phrases were edited to suit the Zambian context. The developed measurement instrument was self-administered, consisting of eight (8) IEO dimensions namely Innovation (5 indicators), Risk-taking (5 indicators), Competitive Aggressiveness (8 indicators), Achievement Orientation (5 indicators), Learning Orientation (6 indicators), Passion (8 indicators), Autonomy (6 indicators) Proactiveness (4 indicators) and one (1) dimension on entrepreneurship Education (EE) namely attitude towards entrepreneurship (18 indicators), with all components measured using a seven (7) Likert scale. The degree of consistency and ensuring that the questionnaire measures what it was designed for as in reliability and validity was done using the Cronbach's alpha coefficients on the questionnaire, resulting in the coefficients between 0.6 – 0.91 deemed to be acceptable, indicating that the items being studied have an internal consistency that is good and deemed to be measuring the same construct reliability which is underlying among the tested items. The Shapiro-Wilk Normality Tests was conducted which revealed that the data was not normally distributed, hence the study using Generalized Linear Models (GLMs) to analyze the data.

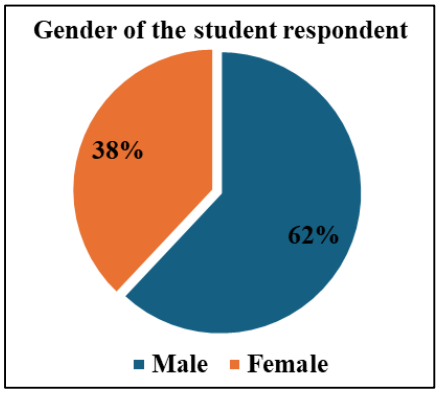

Fig 2: Gender of the respondents

Data analysis and Findings

The dominance of male respondents has been observed in these TEVET institutions causing a gender imbalance. This imbalance has long been noticed globally (UNESCO-UNEVOC 2010), in Zambia (Phiri *et al*., 2023) [48], Kenya (Kamonjo and Wamuga, 2022) [26] in TEVET institutions affecting both developed and developing countries (Ngugi and Muthima, 2017; Bray-Collins *et al*., 2022, Alinea, 2022; Zabaniotou *et al*., 2022) [42, 6, 2, 58].

Data from questionnaires was analyzed using the Generalized Linear Model (GLM), predicting Entrepreneurial Orientation (EO) Outcomes from Entrepreneurship Education (EE) Composite score among students in TEVET institutions in Zambia. GLM was used due to the non-linearity of the data.

Table 1: Generalized linear models predicting various entrepreneurial outcomes from entrepreneurship education composite

Dependent Variable	Coef.	Std. Err.	z	p	95% CI
Innovation Composite Score	.05780	.00791	7.31	< .001	[.04230, .07330]
Risk Taking Composite Score	.00152	.00751	2.52	.045	[.00052, .02954]
Competitive Aggressiveness Composite Score	.02079	.00791	2.63	.009	[.00528, .03629]
Achievement Orientation Composite Score	.05544	.00654	8.48	< .001	[.04263, .06826]
Learning Orientation Composite Score	.05519	.00650	8.49	< .001	[.04245, .06793]
Passion Composite Score	.05348	.00547	9.77	< .001	[.04275, .06420]
Autonomy Composite Score	.00163	.00774	2.58	.042	[.00122, .03142]
Proactiveness Composite Score	.07321	.00730	10.02	< .001	[.05890, .08753]
Attitude Towards Entrepreneurship Composite Score	.13811	.01028	13.43	< .001	[.11795, .15827]

From table 1, Entrepreneurship education (EE) components examined through the EO dimensions in table 1 show a positive and significant impact on the dimensions. From the analysis, the risk-taking composite score, shows a small positive impact on the overall IEO measure indicating a weak relationship on the impact entrepreneurship education (EE) has on risk-taking. These findings are in line with the findings observed by Koe, (2016) [27] who found that risk-taking ability was not an influential factor towards increasing the individual's entrepreneurial intention (EI) among students. Also, the autonomy composite scores, showed a small positive impact indicating a weak impact caused by entrepreneurship education (EE) course on promoting autonomous behavior among students. Similar findings were by Bolton and Lane (2012) [7] and Gorostiaga *et al*., (2019) [22] who excluded the autonomy measure from their IEO measurement instrument. Form the above analysis, the hypothesis below is supported:

H1: The Entrepreneurship Education (EE) course has a positive impact on students' Individual entrepreneurial orientation (IEO) in TEVET institutions of Zambia.

The Attitude towards Entrepreneurship composite score enhanced by Entrepreneurship Education (EE) has a very strong relationship with a z-score of 13.43, indicating a strong significancy and a confidence interval (CI) [0.11795,0.15827] that confirms a strong positive relationship. The above findings highlight the importance entrepreneurial education (EE) has in fostering essential entrepreneurial behaviors and attitudes towards entrepreneurship. These findings support the hypothesis:

H2: Students in TEVET institutions have a high perceptions and attitudes towards entrepreneurship.

Mean score of students IEO by gender

The table 2 below shows that the mean score for IEO between males (4.567) and female (4.588) are quite similar even though the variability of the scores in males (0.5645) is higher than in females (0.3547) as indicated by the standard deviation, which has an indication of the male IEO being more variable.

Table 2: Mean scores of students' IEO by gender

Variable	Gender	Mean Score	Standard Deviation (SD)	t-test	Significance (*Sig.*)
Individual Entrepreneurial Orientation (IEO)	Female	4.567	0.3547	0.129	0.904
	Male	4.588	0.5645		

These results indicates that the level of the IEO in male with a mean score of 4.4588 is higher than the female students with a mean score of 4.567, even though there is no statistically significant difference ($p>0.05$, $t = 0.129$) these findings support the hypothesis:

H3: The levels of IEO between male and female students is different.

Conclusion and Recommendations

Conclusion

This study's findings show that there is a positive relationship between EE and components of IEO even though risk-taking had a low impact, which is in line with the finding by Koe, (2016) [27]. This research also showed how lowly impactful autonomy is towards enhancing IEO among students, with a low reliability Cronbach's Alpha coefficient of 0.61. This confirms Bolton and lane, (2012) [8] finding, who expressed concern over autonomy in educational settings and Gorostiaga *et al*., (2019) [22] removed the autonomy component from their EO scale. This research has also shown that the other dimensions of EO such as passion, learning orientation (LO) and Achievement orientation (AO) are vital towards the development of IEO this anlyisis has helped assessing the impact EE has on the enhancement of IEO, fulfilling its research objective (RO 1).

RQ 1: To assess the impact Entrepreneurship Education (EE) course has on students' Individual entrepreneurial orientation (IEO) in TEVET institutions of Zambia.

This study further shows that the students in TEVET institutions in Zambia on average have a high level of IEO, higher in male than female students, with a non-statistically significant difference in IEO with similar findings as seen from table 2. This analysis helped to achieve research objective (RO) 2.

RO 2: To measure and compare the level of Individual entrepreneurial orientation (IEO) by gender of students in

TEVET institutions.

The relationship between the Attitude towards Entrepreneurship composite score and Entrepreneurship Education (EE) has a very strong relationship with a z-score of 13.43, indicating a strong significance, confidence interval (CI) [0.11795,0.15827] confirms a strong positive relationship, showing that the student's perception is high towards entrepreneurship. This helps in achieving research objective (RO) 3.

RO 3: To Explore students' perceptions and attitudes towards entrepreneurship.

Recommendations

Based on the finding of this study, to enhance entrepreneurship as a viable career option through the provision of entrepreneurship Education (EE) in TEVET institutions, the following recommendation are proposed

1. More experiential learning should be enhanced in TEVET institutions by proving a curriculum that emphasizes and promotes experiential learning by promoting internships, business simulations and incubators which gives the students a hands-on experience as they experiment. This would promote student's risk-taking propensity which embraces failure as part of learning and promote autonomous ability among students as they work on their projects since this study shows that risk-taking and autonomy dimensions showed a low impact towards enhancing the level of IEO in students.
2. Creating a supportive learning environment which promotes real life experiences for the students. This environment could also promote role models such as entrepreneurs within the communities to share their experiences.
3. To solve the problem of gender imbalance in TEVET institutions would need a creation of courses which promote equality, rather than offering traditional course that are dominated by men.
4. The curriculum offered in these institutions need to be improved continuously to incorporate the changes happening, such as incorporating the economic zones being developed in Zambia, to foster collaboration with experts in entrepreneurship.
5. Promote engagement in research and evaluation.

TEVET institutions must engage in continuous research on the entrepreneurship education course with lecturers, students, and other stakeholders so that continuous evaluation is conducted. This would bring out valuable insights into the impact and effectiveness of the EE course. With this approach driven by empirical data, future improvements on the course would yield real time impact.

6. Conducting tracer students with students.

The TEVET institutes need to keep record of the students after graduation and see how many are getting involved in entrepreneurship as a career option. This would further help create a bigger network with the students after graduation and help evaluate the impact of the EE course being provided.

Study's limitation and direction for future research

This study recommends future research to aim at investigating the long-term outcome of EE on entrepreneurial journeys of students, exploring the sustainability of entrepreneurial ventures and orientation using a longitudinal study as compared to this study which used a cross-sectional timeline creating a limitation. A longitudinal study may help create tracer studies on students during training and after training to measure the impact of their education. Further research could also examine the divergent impact of EE across diverse student demographics, including socioeconomic status and gender, even though this study found gender to have no significant impact on IEO, more research could be done to explore this dynamic. This low turnout by the female needs to be further explored, to fully understand the imbalance in these TEVET institutions.

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