RESEARCH ARTICLE

DETERMINANTSOFENTREPRENEURIALINTENTSAMONGENGINEERING STUDENTS: INSIGHTS FROM THE COLLEGE OF ENGINEERING AND TECHNOLOGY AT THE UNIVERSITY OF DARES SALAAM, TANZANIA

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Manuscript Info

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Abstract

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This paper aims to investigate the determinants of entrepreneurial intentions among engineering students at the College of Engineering and Technology (CoET) in the University of Dar es Salaam. Understanding the factors influencing students intends to pursue entrepreneurial actions, the paper addresses the insights to adopt entrepreneurial attitudes built within engineering curricula that emphasized determinants to nurture entrepreneurial intentions among university students across different degree specializations. Demographic characteristics such as gender, family background, attitude, entrepreneurial support, and learning from role models were considered. Primary data was collected through structured questionnaires and secondary data was from the internet, journals, and books. A total of 124 (82.67%) questionnaires were duly filled out and returned. Data was analyzed using SPSS V.25 to conduct descriptive and inferential statistics. Generally, the need for independence is thekey factor in the entrepreneurial intent of future engineers. The study revealed that most students had entrepreneurial intentions emanating from attitudinal factors such as creativity, leadership, locus of control, the need for achievement, and government entrepreneurial support. Both age and family background have insignificant influence on entrepreneurial intention among engineering students. It is recommended that; various agents have to be involved in increasing thepromotion towards the creation of business enterprises and encouragingmore female students to enroll in engineering studies.

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INTRODUCTION

Entrepreneurship is an essential driver for economic growth, creativity, and innovation. For university students pursuing engineering degrees, entrepreneurial intentions are primarily appropriate for problem-solving within their engineering career. In less developed countries, however, entrepreneurial intent tends to grow due to increased unemployment and poverty rates *(Tufa and Patel, 2022)*. The global job gap has been increasing since the 2008 world financial crisis and continues to widen persistently, if the current trends continue, the global unemployment situation and projection will devastate other sectors of the economy if corrective measures are not taken *(Bajpai, 2023)*. Similarly, several indicators show that self- employment among recent university graduates has been falling. Despite the efforts in training entrepreneurship at universities, there has been a generally deteriorating rate of graduates' self- employment worldwide (Hardie, Highfield, & Lee, 2020). The modern entrepreneurial replicas congregate entrepreneurship as an outcome of the cognitive mind preceded by intentions. The logic is that "we don't

start an enterprise as a reflex; instead, we think, plan, and implement the most appropriate opportunity. Demographic characteristics, attitude behaviour, and institutional support affect students' entrepreneurial intentions. Entrepreneurship thus enables wealth creation, jobs, and innovation that contribute to advancing the national coffers and reduce unemployment challenges *(Seibert, Nielsen, & Kraimer, 2021)*.

The global rate of unemployment is on the rise. For example, in Tanzania alone, the estimates of unemployed persons for 2010 were equivalent to 10.7% of the labour force population. By comparing the number of jobs created annually with the rate of population growth, unemployment rate is raising if appropriate measures are not taken *(**Kambi, 2011**; Si, Ahlstrom, Wei, & Cullen, 2019)*. Entrepreneurship has thus been increasingly combined with other fields of specialization in most universities. Entrepreneurial growth creates jobs and reduces unemployment rates. The level of entrepreneurship, however, is not adequately decreasing unemployment *(Tufa, & Patel, 2022)*. Although most universities offer entrepreneurship courses, there has been no appreciable increase in entrepreneurial intent as a means to curb the unemployment problems *(Singh, 2020; Iglesias-Sánchez, Jambrino-Maldonado, Velasco, & Kokash, 2016)*. Due to the current crisis and its high unemployment rates, the labor market increasingly requires multidisciplinary engineers with additional skills to their own. Engineering education therefore faces new challenges in equipping engineers with greater entrepreneurship. Although entrepreneurship education has consequently been integrated into the new engineering degrees, is this enough to boost entrepreneurship among engineers and on what does their level of entrepreneurship depend (Barba-Sánchez & Atienza-Sahuquillo, 2017). This research work aims to analyze the impact of entrepreneurial motivations on entrepreneurial intentions among future engineers and identify the role than entrepreneurship education plays in the development of the engineers' entrepreneurship.

Entrepreneurial Intention Among University Engineering Students

According to **Moriano, Gorgievski, Laguna, Stephan, & Zarafshani, (2012**), entrepreneurial intention (EI) is defined as "the conscious state of mind that precedes action and directs attention toward entrepreneurial behaviors such as starting a new business and becoming an entrepreneur" Entrepreneurial intentions are often measured by asking participants to rate their interest in starting/ owning their own business on a 5-point Likert scale (1 = definitely not interested, 5 = extremely interested). While some scholars assert that personality, prior experience, contextual variables, social contexts, family background, and markets are the critical determinants of entrepreneurial intent, others argue that entrepreneurship education does not appear to contribute towards entrepreneurial intent amongst students. An in-depth assessment of entrepreneurial intent can be a valuable predictor of an ensuing entrepreneurial artifact **(Agyemang, Deh, & Asuamah, 2013**). Factors such as an entrepreneurially supportive environment, a business-oriented society, innovation awareness, and facilitative government policies stimulate entrepreneurial intent. However, little is acknowledged concerning the association amid the likelihood of students taking courses in entrepreneurship and their intentions of becoming entrepreneurs (Giersch, McMartin, Nilsen, Sheppard, & Weilerstein, 2015; Hitt, Ireland, Camp, & Sexton, 2017).

Objectives: -

The main purpose of this paper is to investigate the determinants of entrepreneurial intentions among engineering students in Tanzania. Specifically, the objectives were: to explore the relationship between demographic factors and entrepreneurial intentions, to examine the relationship between attitudinal factors and entrepreneurial intentions, and to assess the relationship between institutional support and entrepreneurial intentions. Engineering students in entrepreneurship programs gain insights into designing for end users, working and managing interdisciplinary teams, communicating effectively, thinking critically, and understanding the essentials of owning self-businesses. Similarly, the duty of the faculty members in engineering studies is to prepare students for more innovative and entrepreneurial roles in their respective fields, and other players such as policymakers, curriculum developers, and the public in general are supposed to deliver both technical and entrepreneurial competences for their career development. This paper demonstrates how effective the entrepreneurial competencies have been prepared to develop the engineering students as a future generation of engineering entrepreneurs and contribute knowledge in entrepreneurship based on demographical, attitudinal, and institutional supports. The paper guides the development of an entrepreneurially supportive environment, a business-oriented society, and awareness of facilitative government

policies among engineering students. The results will be useful in re-shaping the mode of delivery of entrepreneurship courses at the universities in Tanzania with positive impacts toward entrepreneurial intentions among engineering graduates.

Scope

The study dealt with determinants of entrepreneurial intentions among engineering students at the College of Engineering and Technology in the University of Dar es Salaam, Tanzania. The study hinged on two theories: the theory of reasoned action (TRA) and the theory of planned behaviour (TPB), with a focus on final year students studying engineering only. The data collection instruments were questionnaires with structured questions that demanded close-ended responses from analyzed data by means of Statistical Package for the Social Sciences (SPSS V.29). These findings may lead to limited generalization of the study findings.

THEORETICAL LITERATURE REVIEW

Generally, an individual's intention is an anticipated outcome guided by planned actions that predict thoughtful behaviour and hold emotional factors that indicate one's determination to execute intentional behaviour. Independent variables include demographic, attitudinal, and support factors, and the dependent variable is entrepreneurial intention, as illustrated in Figure 1.

Figure 1. Conceptual Model
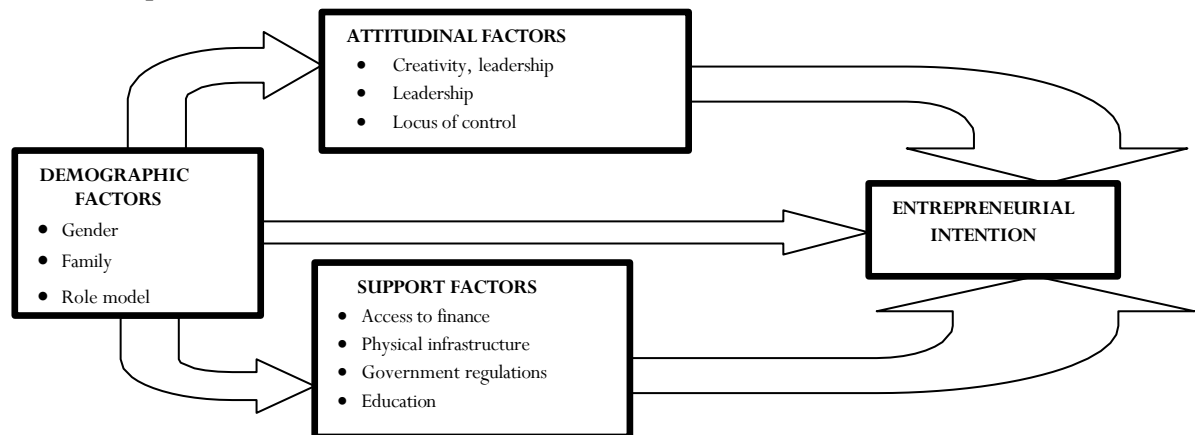
Source: Researchers' Own Construct.

Modern-day researches confirm that entrepreneurship education impacts on entrepreneurial self-efficacy that leads to acquisition of entrepreneurial intentions among entrepreneurship students across different professions (**Wilson et al., 2007**). Through entrepreneurship programs, students gain insights into working and managing interdisciplinary teams, thinking critically, design products and services for ultimate consumers, communicate effectively, comprehend business necessities and solve commodities' problems facing the society. Although it is the responsibility of the teaching staff to enlighten their students to be more innovative and entrepreneurial, the policy makers, curriculum developers and the public in general are supposed to work coherently to deliver students both technical and entrepreneurial competences to students. Previous studies indicate that entrepreneurship education only doesn't appear to cause entrepreneurial intentions to start firms amongst students. Other scholars have shown that the entrepreneurial intent analysis can be a useful predictor of eventual outcome. Factors such as entrepreneurial supportive environment, business-oriented society and awareness of facilitative government policies also prompts entrepreneurial intent among students.

Theory of Reasoned Action (TRA)

The theory of reasoned action (TRA) postulates that, a person's voluntary behaviour, personal attitude, and subjective norms form individual behavioural intent. However, attitudes and norms depend on the individual and the situation to influence behavioural intention *(Hoewe & Sherrick, 2015)*. The behavioural intentions, as a function of attitudes and subjective norms toward that behaviour, predict the actual behaviour. The TRA can be expressed as an equation.

$$BI = (AB)W1 + (SN)W2 \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.1$$

Where:

   BI = Behavioural intention;
   AB = Attitude toward performing the behaviour.
   W2 = Empirically derived weights;
   SN = Subjective norm related for performing the behaviours.

Entrepreneurial intention determines behaviour, attitude, and subjective norms that explain the intention. However, the TRA theory disagrees that before exercising the behaviour and other conditions necessary for performing the behaviour are not considered, thus behavioural intention may be affected *(Ajzen & Fishbein, 1980; Hale, Householder, & Greene, 2002)*.

Figure2: -Theory of Reasoned Action (TRA).
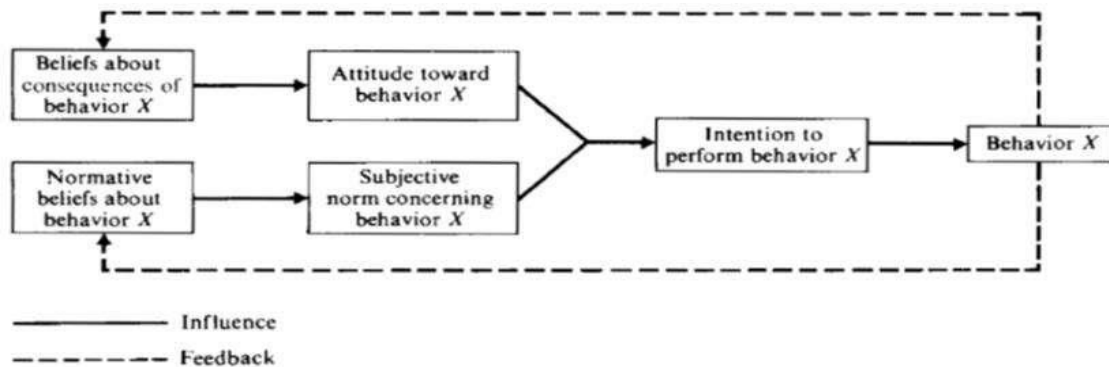
Source: Adopted from Fishbein and Ajzen (1975). Belief, attitude, intention, and behaviour: An introduction to theory and research.

Theory of Planned Behaviour (TPB)
Theory of planned behaviour (TPB) posit that, the three constructs including: attitude toward behaviour, perceived behavioural control; subjective norms are expected to be positively influenced, albeit on a high level, by the entrepreneurship education programs. As entrepreneurial intention is dependent on and directly influenced by these three variables in the theory of planned behaviour, it can be expected that entrepreneurial intention will be positively influenced by the entrepreneurship education program and a clear appreciation of the government initiatives and other supports regarding entrepreneurial intention as seen in Figure 3.

Figure3: -Theory of planned behavior.
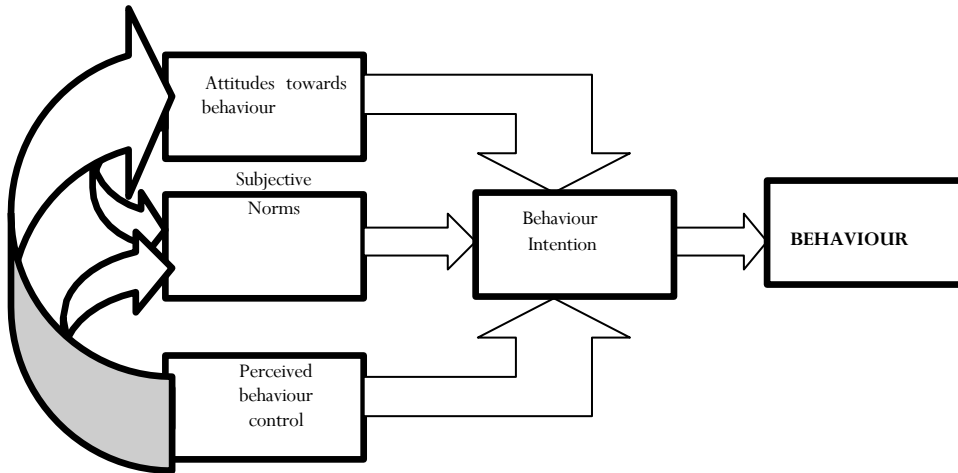
Source: Ajzen (1991). Theory of Planned Behaviour; Organizational Behaviour and Human Decision Process.

The independent determinants of entrepreneurial intention and attitude toward that behaviour, or the degree Consequently, attitudes and perceived behavioural control account for intentions and inspire others to believe that all the three predictors make independent contributions, attitudes toward behaviour intention and perceived behaviour control (***Gird, & Bargaim, 2008***). favourable the attitude and the subjective norm concerning for behaviour, and the greater perceived behavioural control, the stronger the individual's intention to perform that behaviour under consideration. Attitude toward behaviour is the individual's positive or negative feelings about performing the behaviour regarding the consequences arising from that behaviour. Overall attitude can be expressed as a sum of individual consequences multiplied by the desirability assessments for all expected consequences of the behaviour that can be mathematically expressed as:

$$Attitude = \sum_{n=1}^{k} (Consequence_n \; x \; Desirability_n) \dots \dots \dots \dots \dots \dots \dots \dots (2$$

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$$Attitude = \sum_{n=1}^{k} (Consequence_n \; x \; Desirability_n) \dots \dots \dots \dots \dots \dots \dots \dots (2)$$

Attitude toward behaviour is the individual's positive or negative feelings about performing the behaviour and the consequences arising from that behaviour. Equation 2. summarizes the theory of planned behaviour. The extend to which a person feels capable of acting on that behaviour is perceived behavioural control, as determined by the control beliefs of situational and internal factors that facilitate the performance of that behaviour. Consequently, attitudes and perceived behavioural control account for intentions and inspire others to believe that all the three predictors make independent contributions, attitudes toward behaviour intention and perceived behaviour control (***Gird, & Bargaim, 2008***). Equation 3 summarizes the theory of planned behaviour.

$B \approx BI = (AB)W1 + (SN)W2$.. (3)

Where:

    B = Behaviour;
    BI = Behavioural intention;
    AB = Attitude toward behaviour;
    SN = Subjective norms;
    W1 and W2 are weights.

Over the years, scholars have used TPB and added other workings to yield an integrated model. TPB theory however, assumes that the person has acquired the resources and opportunities to become successful in performing the desired behaviour regardless of the intention together with the intention to perform the behaviour.

Demographical, attitudinal, and institutional support for family background

The foundation of entrepreneurial endeavour emerges from an individual's keenness and a conducive societal context towards entrepreneurial actions. The skills distinguishing an entrepreneur from others are personal traits, e.g., inner control, risk-taking, innovativeness, vision, and being change-oriented. Strong entrepreneurship orientation embraces self-efficacy, innovativeness, pro-activeness, autonomy, risk-taking, and competitive aggressiveness (Mbura, 2013; Korte, Smith, & Li, 2018). Determining students' entrepreneurial traits is a necessary part of their overall entrepreneurial intentions. In South Africa, for example, male students are more likely to engage in business start-ups. Since entrepreneurs create new ventures by taking risks to gain benefits, they have to be ready to think of new opportunities, cope with challenges, and expand their venture activities. In Tanzania, more male students intend to start their businesses than females (Malebana, 2012).

The personality trait is one of the attitudinal factors of entrepreneurial behaviour, preceded by intentions, as it predicts regularities in risk-taking, achievement motivation, and locus of control. The family's influence affects its members' entrepreneurial intent and ultimately profiles the student's entrepreneurial goals. The culture in which one lives impacts the development of entrepreneurial propensities. Students whose parents engage in business demonstrated a high level of entrepreneurial intent to start their entrepreneurial ventures, signifying the family in which one was raised influences their entrepreneurial character. However, some research has proved that the offspring of successful entrepreneurs may not necessarily become successful entrepreneurs since their ambitions may distract entrepreneurial succession from their parents *(Zhao, Jiang, Fang, & Weng, 2023)*.

Demographical, attitudinal and institutional support

Demographic factors take the form of a gender-based legend to frame the use and control of resources that reinforce engagement into commercial initiative and family life **(Bowman, 2008)**. Personality trait is the attitudinal factors of entrepreneurial behaviour preceded by intentions as it predict regularities in risk taking, achievement motivation and locus of control **(Gifford, 2003)**. Since entrepreneurs create new ventures by taking risks to gain benefits, they have to be ready to think of new opportunities, cope with challenges and expand created ventures **(Riyanti, 2007)**. Educational support through professional education in universities is an efficient way of obtaining necessary entrepreneurial knowledge. The encouragement from universities and also affects the entrepreneurial confidence of the students.

Family background

The family influence affects its members' entrepreneurial intent and ultimately profile the student's entrepreneurial goals. The culture in which one lives have impact on the development of entrepreneurial propensities. Students whose parents engage in business demonstrated high level of entrepreneurial intents to start their entrepreneurial ventures **(Olomi and Sinyamwale (2009).**

Empirical Literature Review

Comparing France and the United States of America (USA), the previous studies indicated that, the American students demonstrated to have a higher degree of entrepreneurial intention than the students in France (**Boissin, Branchet, Emin, & Herbert, 2009**). Americans have a high degree of pro-independence with more significant internal locus of control, which is vital for entrepreneurship *(Autio, Keeley, Klofsten, & Ulfstedt, 2009)*. Comparing Chinese and American university students, the male students in China displayed a greater intent toward self-employment than the female students, indicating that entrepreneurial undertakings are more related to men than women, and entrepreneurial intent was more robust in the American students due to their independence culture

(Ozaralli, & Rivenburgh, 2016). However, Chinese students with experience in self-employment had a greater intention to become self-employed. But work experience and family background play significant roles in the formation of entrepreneurial intentions in both China and the USA *(Ali, Lu, & Wang, 2013).*

In Denmark, entrepreneurial intent is influenced by psychological characteristics, individual skills, and environmental influences entrepreneurial intentions than to be employed *(Alamineh, 2022; Fini, Grimaldi, Marzocchi, & Sobrero,* 2009). In Norway, entrepreneurial intent was low due to the higher compensation employees enjoy compared to the benefits arising from business starters. In Norway, the low entrepreneurial intent among employees can be attributed to the comparatively higher compensation and benefits they receive in their current employment, which outweigh the potential advantages of starting their own businesses. Research indicates that employees often weigh the socioeconomic benefits of entrepreneurship against the security and rewards provided by their existing jobs. For instance, Ahmetoglu et al. highlight that employees' entrepreneurial tendencies are closely linked to their job satisfaction and the perceived value of their current compensation packages (Zeng et al., 2022). This sentiment is echoed by Malik, who asserts that employee satisfaction with compensation and benefits significantly influences their intention to remain with their current employer rather than seek entrepreneurial opportunities (Ahmetoglu et al., 2020).

In Australia, the influence of entrepreneurship education on students' perceptions of self-employment intentions is well-documented in the literature. Research indicates that entrepreneurship education significantly enhances students' entrepreneurial self-efficacy, which in turn positively affects their intentions to pursue self-employment. For instance, Wu et al. demonstrate that entrepreneurship education not only increases students' self-efficacy but also fosters a stronger intention to engage in entrepreneurial activities (Wu et al., 2022). This finding is corroborated by Mei et al., who assert that higher levels of entrepreneurship education correlate with increased self-efficacy in decision-making, thereby enhancing students' entrepreneurial intentions (Mei et al., 2020).

Entrepreneurial intention among university students of a developing economy, the mediating role of access to finance and entrepreneurship program, clearly demonstrate that the integration of access to finance and practical entrepreneurship programs significantly boosts the entrepreneurial aspirations of university students, encouraging them to pursue entrepreneurship as a career path (Shahriar, Hassan, Islam, Sobhani, & Islam, (2024). In South Africa for example, male students were more likely engage into business start-up activities and in Tanzania, the large proportion of male students intended to start their own businesses than their counterpart females **(Oni & Mavuyangwa, 2019).** The need to promote entrepreneurship in South Africa fosters a positive attitude as an alternative career choice. Students in South Africa prefer entrepreneurship as it is a way to create jobs, as there are limited job opportunities in the country**.**

The study undertaken in Uganda indicates that there is no significant difference in the entrepreneurial intentions between business and non-business students (Kisubi, Korir, & Bonuke, 2020). Researchers found that both entrepreneurship education and attitude significantly predict students' entrepreneurial intentions. Results also indicate that attitude partially mediates the relationship between entrepreneurship education and entrepreneurial intentions. Theoretically, our study validates Liñán's entrepreneurial intention model in a developing country like Uganda. The study contributes to the already existing literature in regard to the direct effect of entrepreneurship education on entrepreneurial intentions and creates new insights on the indirect effect of entrepreneurship education on entrepreneurial intentions. Furthermore, the study suggests practical implications for policymakers, educators, and curriculum developers. The study tested the entrepreneurial intention model by Liñán and created new knowledge in the area of the mediating effect of entrepreneurial attitude in the relationship between entrepreneurship education and entrepreneurial intentions.

In Tanzania, the entrepreneurial environment contributes significantly to the decline of entrepreneurial intent, emanating from a lack of start- up capital, an inhibitive banking and taxation system, a poor sense of trust and technology, and rampant corruption. Specialization in entrepreneurship education promotes personality traits, entrepreneurial attitudes, and intentions more than non-specialization, regardless of the nature of the entrepreneurial career. For engineering students to become successful entrepreneurs, universities ought to emphasize tailor-made programs grounded in a mindset shift towards entrepreneurial intentions as future entrepreneurs rather than relying only on formal employment *(Mwakujonga & Bwana,* **2013).**

METHODOLOGY

A cross-sectional survey research design was used due to its ability to explain the prevailing conditions as perceived by the respondents and the studies are carried out once at a particular point in time, are present oriented and not repetitive in nature, a researcher has no control over the subject and it is possible to obtain information on variables in different contexts at the same time (Mekuria, 2019). A cross-sectional survey design is a snapshot of an ongoing situation, provides external validity of the results so that the findings can be effectively generalized and allows the possibility to collect data from a sizeable population using standardized instruments and control over the research process. As a positivistic deductive approach, the design seeks the causes of a social phenomenon with little regard for the subjective state of an individual (*Lune & Berg, 2017*). Thus, logical reasoning is applied to the research study so that objectivity and precision replace experience and intuition as means of investigating a research problem. A cross-sectional survey design however, does not explain how and why correlations exist on its own.

A combination of qualitative and quantitative paradigms as the two methods are found to complement each other in order to maximize their individual strengths and minimize sterility (Mattar & Ramos 2022). This technique involves a free format of responses that allow to access in-depth information from different respondents. Although the qualitative paradigm has a tendency to be process oriented, subjective, and descriptive based on feelings and attitudes, it enabled the understanding of a particular event, allow free express of feelings and is a scientific method of evaluation from a given population to represent opinions. Since there is no quick-fix process in analyzing qualitative data, one as to make sense of relevant data gathered from different sources, it requires a clear grouping, classifications, examining perceptions and interpretation. Essentially, its analysis depended on logic and of proper techniques of evaluation (Lichtenstein & Rucks-Ahidiana, 2021). On the other hand, quantitative paradigm is objective, specific, structural, and analyzes numerical data and statistical tests. It contains a factual basis and measurable data and is analysis based and depends on logic using analytical and mathematical deductions (Haegele, & Hodge, 2015). While the qualitative approach was used to discover themes and relationships of the same level, the quantitative approach was used to validate those themes and relationships in the same sample (Wood & Alsawy, 2017).

Study Area and Population

The study was conducted at the College of Engineering and Technology (CoET), University of Dar es Salaam (UDSM), Tanzania. CoET was selected due to its heterogeneity as the largest engineering college in the country, containing engineering students in different areas of specialization. It covers six (6) academic departments, including Chemical and Mining Engineering (CME), Electrical Engineering (EE), Mechanical and Industrial Engineering (MIE), Structural and Construction Engineering (SCE), Transportation and Geotechnical Engineering (TGE), Water Resources Engineering (WRE), Technology Development and Transfer Centre (TDTC), and the Bureau of Industrial Cooperation (BICO). The targeted study population consisted of 250 fourth-year engineering students from all departments at CoET.

Probability sampling and non-probability sampling were used. Probability sampling permits equal chances of selection among respondents, and non-probability sampling brings about a theoretical representation of the population and maximizes the scope of variation of the study (**Bell, Bryman, & Harley, 2022**). A sample size of 150 was purposefully drawn, in which 150 questionnaires were distributed to respondents and 124 questionnaires were returned, which is equivalent to an 82.67% response rate. Primary data collection includes questionnaires, interviews, and focus group discussions (FGD). Secondary data were collected from journals, published materials, and university websites. Cronbach's alpha (α) was used to measure reliability. Thematic data analysis technique was used to detect the themes and intuitions from qualitative data and statistical methods including multiple regression analysis, factor analysis, reliability test fitness to the model, and analysis of variance (ANOVA). to find substantial predictors of entrepreneurial intention from quantitative data.

Logistical and ethical considerations

In the context of a scientific inquiry, the appropriateness of the researcher's behavior in relation to the rights of those who become the subject of the study is governed by moral values that shape the conduct of an individual or a group. Doing what is right is somehow contrary to doing what is good for the activity. Though behaving ethically has value in itself, there are other benefits for ethical researchers when dealing with people and programs that are culturally sensitive (Cai, 2024**).** Prior to the main study, respondents were informed about the purpose of the study and that the

information collected would be used for academic purposes only. To balance between the right to access information and personal integrity, the study adopted the informed consent approach, where respondents were decidedly willing to partake in the study and assured of both confidentiality and anonymity of the information they provided.

FINDINGS

The foundation of entrepreneurial endeavor emerges from an individual's entrepreneurial eagerness and a conducive societal context towards entrepreneurship. In the same way, demographic characteristics form a gender-based legend to frame the use and control of resources that reinforce engagement in commercial initiatives and family life. Table 1 shows respondents' gender characteristics.

Respondent Characteristics by Gender

Demographic factors take the form of a gender-based legend to frame the use and control of resources that reinforce engagement in commercial initiatives and family life. Table 1 presents the characteristics of respondents by gender.

Table 1: Students' Characteristics by Gender and Departments

Sex	Freq,	Percent	Department	Frequency	Percent	
Males	95	76.6	EE	41	33.1	
Female	29	23.4	MIE	29	23.4	
Total	**124**	**100.0**	SCE	15	12.1	
			CME	17	13.7	
			TGE	19	15.3	
			WRE	3	2.4	
			Total	**124**	**100.0**	
DEPARTMENTAL GENDER CHARACTERISTICS						
Sex	CME	EE	TGE	MIE	CSE	WRE	Total
Males	16	16	10	22	10	2	92
Females	6	6	6	0	6	1	32
Total	**22**	**22**	**16**	**22**	**16**	**3**	**124**
Percent	*17.74%*	*17.74%*	*12.90%*	*17.74%*	*12.90%*	*2.42%*	*100%*

KEY: EE - Electrical Engineering; MIE - Mechanical and Industrial Engineering;
         SCE - Structural and Construction Engineering; CME - Chemical and Mining Engineering;
         TGE - Transportation and Geotechnical Engineering; WRE - Water Resources Engineering

The ratio of males (76.6%) and females' students (23.4%) reflects the proportion of students at CoET who opted for engineering programs. These findings are similar to the results of other previous studies that exhibited that entrepreneurship as a male-dominated activity in the engineering field. Female students are interpreted to have some feminine characteristics, e.g., courage and self-esteem, though they are fewer but have as high esteem as their fellow male students (Deh, Asuamah, & Agyemang, 2013).

Principal Component Factor Analysis (PCFA) and Component Matrix

Factor analysis was used to identify and reduce the number of constructs from measured variables. It was conducted on all constructs of entrepreneurial intentions in which communalities and component matrices aided to interpret the underlying structure of the data. Communality matrix is the sum of the squared loadings for a particular item, which indicates the proportion of variance for that given item explained by the factors. The higher the communality value, the more the extracted factors explain the variance of the item. The elements of the component matrix are the correlations of the item with each component and the sum of the squared eigenvalues is the proportion of variance under total variance explained

In PCA, the total variance explained by each principal component is a measure of how much of the data's variability is captured by that component. The first principal component explains the most variance, with each subsequent component explaining progressively less (Lowder, & Williams, 2012). The cumulative variance explained by the principal components is used to decide how many components to retain in the analysis. Table 3 illustrates the principal component factor analysis and component matrix.

Table 3: PCA, Communalities, Component Matrix, and Total Variable Explained

Communalities			Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Construct	**Initial**	**Extraction**	1	Total	Var. %	Cumm. %	Total	Var %	Cumm. %
1. I am ready to do anything to be an entrepreneur	1.000	.570	.905	2.885	72.1	72.123	2.134	53.343	53.343
2.My professional goal is to be an entrepreneur	1.000	.818	.896	.585	14.6	86.749			
3.I will make every effort to start and run my own business	1.000	.803	.833	.303	7.56	94.312			
4. I am determined to create a business venture in the future	1.000	.693	.755	.228	5.68	100.000			
Extraction Method: *Principal Component Analysis.* ***a.*** *1 component extracted*									

Community is a feeling of cooperation and belonging arising from common interests, goals, belonging, and a shared faith through a commitment to be together. From Table 3, over 80% of the variance in the constructs is accounted for, and 57% of the variance in the construct 'I am ready to do anything to be an entrepreneur is accounted for' was therefore extracted (pulled out). The considerable factor accounted for 72.12% of the variance; their remaining factors were insignificant. Similarly, the sum of eigenvalues cannot exceed the number of items since each item contributes to the sum of variances, the elements of the component matrix are correlations of the item with each component, and the sum of the squared eigenvalues is the proportion of variance under the total variance explained. All loadings less than 0.5 were suppressed. Eigenvalue is the standardized variance associated with a particular factor. Since one component was extracted, the goal of matrix component analysis was not accomplished.

Entrepreneurial Support

Educational support through university professional education is an efficient way of obtaining the necessary entrepreneurial knowledge. The encouragement from universities likewise affects the entrepreneurial confidence of the students. Table 4 shows the communality, component matrix, and total variable explained.

Table 4: Component Matrix

Communalities			Component Matrix	Initial Eigen values			Extraction Sums of Squared Loadings		
Constructs	Initial	Extraction	1	Total	Variance %	Cumm. %	Total	Variance%	Cumul, %
1. It is possible to access finance for starting and running business in Tanzania	1.000	.475	.795	2.134	53.343	53.343	2.134	53.343	53.343
2. There are supportive environment and friendly physical infrastructure for starting and running businesses in Tanzania	1.000	.632	.733	.900	22.505	75.848			
3. Government regulations regarding running of businesses in the country are supportive to entrepreneurs	1.000	.490	.700	.605	15.116	90.964			
4. Entrepreneurship education will enable me to start and run my own business in the future	1.000	.537	.689	.361	9.036	100.000			

Extraction Method: Principal Component Factor a.1componet extracted.

In table 4, the construct 'There is a supportive environment and friendly physical infrastructure for starting and running businesses in Tanzania', accounts for 63.2% of the variance, and the account for less of the variance, the construct 'a supportive environment and friendly physical infrastructure for starting and running businesses in Tanzania' was therefore extracted. The students were asked to indicate their concerns about government entrepreneurial support, institutions, and the services or funds based on seven-point Likert- type response format questions, A high percent of students knew how the government's institutions provide entrepreneurial support and the services offered to cope with the expected level of entrepreneurial intent. The total variables explained in the analysis, along with their eigenvalues, the percent of variance attributable to each factor, and the cumulative variance of the factor and the previous factors, indicate that the first factor accounts for 53.34% of the variance, the other remaining factors do not have much significance, and from the loadings of the four variables, one factor was extracted.

Total Variance Explained
The total variance explained represents the proportion of the total variability in the data that is accounted for by a statistical model that is commonly used in many statistical analyses e.g. regression analysis, correlation analysis, and principal component factor analysis (Fulmer, 2009). Table 5 shows the factors extractable from the analysis along with their eigenvalues, the percent of variance attributable to each factor, and the cumulative variance of the present and previous factors. Table 5 indicates that 56.9% and 11.57% of the variance were accounted for by the first two components i.e., 'My professional goal is to be an entrepreneur' and 'I will make every effort to start and run my own businesses with total initial eigenvalues of 6.828 and 1.388 respectively. Therefore, the were extracted since other components were insignificant.

Table 5. Total Variance Explained

Components	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
My professional goal is to be an entrepreneur	6.828	56.901	56.901	6.828	56.901	56.901
I will make every effort to start and run my own business	1.388	11.571	68.472	1.388	11.571	68.472
I am determined to create a business venture in the future	.761	6.339	74.811			
I am ready to do anything to be an entrepreneur	.662	5.514	80.325			
It is possible to access finance for starting and running business in Tanzania	.568	4.729	85.055			
There are supportive environment and friendly physical infrastructure for starting and running businesses in Tanzania	.487	4.059	89.114			
Government regulations regarding running of businesses in the country are supportive to entrepreneurs	.363	3.022	92.136			
Entrepreneurship education will enable me to start and run my own business in the future	.338	2.821	94.956			
Where have been employed previously?	.237	1.978	96.934			
Where has your father been employed/is employed?	.198	1.651	98.585			
Where has your mother been employed/is employed?	.102	.853	99.439			
Where has your role model (in the context of entrepreneurship) employed/is employed?	.067	.561	100.000			

Source: Extraction Method Analysis

RELIABILITY TEST

To test the reliability of the recognized critical constructs, the Cronbach's alpha (α) was used since it is the most common measure of reliability that is capable of verifying the consistency of the scale and allows for replication of the results for similar studies in different contexts *(Bell, Bryman, & Harley, 2022)*. Cronbach's alpha with value above 0.8 is considered very reliable, and values below 0.7 are considered unreliable *(Livingston, Carlson, & Bridgeman, 2018)*. The reliability of the critical constructs was obtained after reducing the item deletion reliability. Item deletion reliability measures how well a test maintains its accuracy and consistency even if one of its terms is removed. It provides the robustness and reliability of a test. Table 6 summarizes the item's deleted reliability.

Table 6: Items Deleted Reliability

Entrepreneurship Intentions				
Variable/Construct	**Scale Mean if Item Deleted**	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Squared Multiple Correlation**	**Cronbach's Alpha if Item Deleted**
My professional goal is to be an entrepreneur	17.6694	17.784	.568	.361	.851
I will make every effort to start and run my own business	17.2742	16.396	.774	.642	.744
I am determined to create a business venture in the future	16.7500	18.563	.769	.608	.756
I am ready to do anything to be an entrepreneur	16.6774	20.936	.616	.453	.819
Entrepreneurial Support				
Variable/Construct	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
It is possible to access finance for starting and running business in Tanzania	13.1129	18.296	.443	.307	.672
There are supportive environment and friendly physical infrastructure for starting and running businesses in Tanzania	14.2419	17.860	.575	.390	.590
Government regulations regarding running of businesses in the country are supportive to entrepreneurs	13.8710	18.991	.441	.335	.671
Entrepreneurship education will enable me to start and run my own business in the future	12.0000	18.358	.508	.292	.630
Role Models 1				
Variable/Construct	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Where have been employed previously?	10.6532	20.407	.844	.749	.961
Where has your father been employed/is employed?	10.3710	20.186	.918	.881	.948
Where has your mother been employed/is employed?	10.4677	20.088	.918	.862	.948
Where has your role model (in the context of entrepreneurship) employed/is employed?	10.4113	20.228	.908	.832	.950
Where do you envisage to be employed?	10.3548	20.621	.871	.774	.956

In Table 6, concerning entrepreneurial intents, all items were significant and retained. However, the item "My professional goal is to be an entrepreneur was deleted to improve the Cronbach's alpha by 0.005. However, the item "My professional goal is to be an entrepreneur' was deleted to improve the Cronbach's alpha by 0.005. Deletion of other constructs reduced it, although their Cronbach's alpha value was above 0.7. Concerning entrepreneurial support, the scale proved good internal consistency since the Cronbach's alpha, (α) = 0.704 and on the standardized item, α = 0.707. Cronbach's alpha (α) becomes unsuitable if any is deleted since the value drops below the threshold of 0.7. With respect to entrepreneurial role models, the children inherently imitate the behaviour of the parents as their role models by emulating their characters. The showcase traits, e.g., the ability to inspire, having a clear set of values, and being selfless and committed to one's goals (Zhao, Jiang, Fang, & Weng, 2023), In the variable role mode, the scale used gave a good reliability Cronbach's alpha, (α = 0.95) and a similar value on a standardized item.

Table 7: Internal Consistency Test

Internal Consistency **Test**				
SN		Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items
1	Entrepreneurial intention	.837	.846	4
2	Entrepreneurial Support	.704	.707	4
3	Attitudinal support	.927	.929	12
4	Role Models	.962	.962	5

The entrepreneurial process is complex and can be influenced by numerous factors that lack a universally agreed-upon set of personality traits. Entrepreneurial intention reflects the states of mind that direct attention, experience and action towards a particular occupation or establishment of entrepreneurial initiatives. From Table 7, the scale for entrepreneurial intention proved reliable since the Cronbach's alpha ($\alpha = 0.837$) and the standardized item Cronbach alpha ($\alpha = 0.846$).

Correlation Analysis (Variables' Association)
Numerous scholars perceive correlations as suitable since they specify a predictive relationship that can be used in assessing the joint variation among variables, the strength of the association, and statistical significance. Correlation is an essential tool of analysis in economics and business, where there is often a correlation among variables. Correlation analysis establishes the degree of existence and direction of relationship among variables (Wang, 2014; Shipley,2016; Black, 2023). Table 8 shows the correlation among variables.

Table 8: Correlation Matrix

		ENTRE_INT	SEX	SUPPORT	FAMILY
Pearson Correlation	Entre-Int	1.000	.023	.564	-.104
	Sex	.733	1.000	.076	.052
	Support	.564	.076	1.000	-.053
	Family	-.104	.052	-.053	1.000
Sig. (1-tailed)	Entre-Int	.	.401	.000	.125
	Sex	.401	.	.201	.284
	Support	.000	.201	.	.281
	Family	.125	.284	.281	.
N	Entre-Int	124	124	124	124
	Sex	124	124	124	124
	Support	124	124	124	124
	Family	124		124	124

Key: ENTRE-INT = Entrepreneurial intention

There is a negative correlation between the variables 'Entrepreneurial Support and Family Background' and between the variables 'Family Background' and 'Entrepreneurial Intentions'. The correlation between other variables is positive at $p \leq 0.05$. From table 10, variable 'Sex'' has a significant value of 0.733, which is greater than 0.05. The correlation matrix indicates that, there is no significant relationship between sex and entrepreneurial intent among engineering students. Similarly, there is no significant relationship between family background and students' entrepreneurial intent. Concerning awareness of entrepreneurial support initiatives, the significant value for the variable 'Support' is 0.000 which is less than 0.05. Therefore, there exist a significant relation between students' perceived level of entrepreneurial support and their entrepreneurial intention. The study results show that entrepreneurial intent among engineering students is high.

Multiple Linear Regression
The aim of multiple linear regression is to predict the dependent variables based on its covariance in relation to independent variables. Multiple linear regression enhances the ability to estimate the dependent variable and describe the accurate relationship with independent variables (Hickey, Kontopantelis, Takkenberg, & Beyersdorf,

2019). The summary of the regression model is presented in Table 9.

Table 9: Summary of the model 3

Model	R	R²	Adjusted R²	Std. Error of the Estimate	Change Statistics				
					R² Change	F Change	df1	df2	Sig. F Change
1	.694ᵃ	.482	.464	.73182726	.482	27.665	4	119	.000
a. Predictors: (Constant), Sex, Attitude, Family, Support									

Multiple linear regression attempts to model the relationship between two or more dependent and independent variables by means of appropriate linear equation for the observed data (Adhikari, 2022). The values of independent variables i.e. sex, support, attitude, and family were associated with entrepreneurial intentions (dependent variable). The fitness of the model was tested by R^2, F-test, significance level and additional coefficients. R^2 measured the extent to which the total variation of the dependent variable is explained by the regression model (Shinnar, Hsu, Powell, & Zhou, 2018; Osborne, & Waters, 2019*)*. From Table 8, R^2 = 0.482 (48.2%) of the variance of the dependent variable is explained by the independent variables. The model reaches statistical significance (Sig = 0.000 at $p \leq 0.05$). The F value tells whether the model is significant, implying that it is an important predictor (Liu, Lin, Zhao & Zhao, 2019).

A histogram for the residuals of a regression model was created to validate the assumptions underlying the model, confirm that residuals are normally distributed, enhances the robustness of the findings and reinforce the credibility of the statistical inferences (Bernhardt, 2018) Regression histogram and plot of regression residual are displayed in Figure 4 and Figure 5.
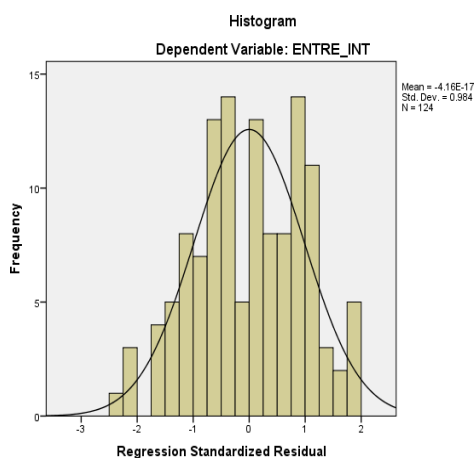

Figure 4: Regression histogram

Figure 5: Plot of Regression Residual

Key: ENTRE_INT=Entrepreneurship ntent

Source: Statistical primer: checking model assumptions with regression diagnostics. *Interactive cardiovascular and thoracic surgery*, *28*(1), 1-8.
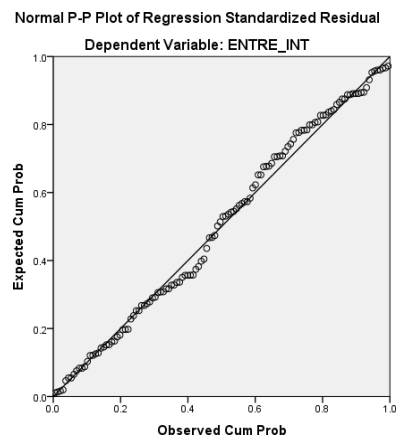
A residual plot is a graph that shows the residuals on the vertical axis and the independent variable on the horizontal axis. It is a test for detecting outliers that need to be removed. If the points in a residual plot are randomly dispersed around the horizontal axis, a linear regression model is appropriate for the data; otherwise, a nonlinear model is more appropriate. Regression lines can be used as a way of visually depicting the relationship between the independent (x) and dependent (y) variables in the graph. A straight line depicts a linear trend in the data (i.e., the equation describing the line is of first order. While a raw residual is the difference between an observed value and a predicted value in a regression or other relevant statistical tool, a standardized residual is the raw residuals divided by an overall standard deviation of the raw residuals which provides a consistent measure of the predicted error. A bell-shaped histogram indicates that the residuals are normally distributed and validates the key

assumptions of regression analysis (Rocha, Shamarova, & Simas, 2016). Both regression histogram and plot of regression residual validated the key assumptions of the regression mode, that there are no outliers.

Analysis of variance (ANOVA) and the model coefficients

Most scholars in entrepreneurship literature acknowledged the influence of prior experience to on individual's performance that, prior experience may be inherent or acquired through entrepreneurial endeavour. The analysis of variance (ANOVA) and the model coefficients are illustrated in Table 10.

Table 10: Analysis of Variance (ANOVA) and the Model Coefficients

			ANOVA					β coefficients				
	Model	SS	df	MS	F	Sig.		Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
1	Regression	59.267	4	14.817	27.665	.000		Model				
	Residual	63.733	119	.536			1		B / Std. Error	Beta		
	Total	123.000	123					(Constant)	.058 / .187	-	.308	.759
								Support	.329 / .077	.329	4.295	.000
	a. Dependent Variable: ENTRE_INT							Attitude	.461 / .077	.461	6.024	.000
	b. Predictors: (Constant), Sex, Attitude, Family, Support							Family	-.064 / .066	-.064	-.974	.332
								a. Dependent Variable: Entre_Int				

These findings are in line with those of Setiobudi and Herdinata (2018) & Sharma (2014), who posit that, there is a significant difference between generations and biological constructs in relation to entrepreneurial intention. For the model coefficients, unstandardized β and the constant are included. The equation for the regression line can be expressed as: Entrepreneurship Intention = 0.58 + 0.329 (support) + 0.461 (attitude) -0.064 (family) - 0.046 (sex). Therefore, entrepreneurial intention is somewhat influenced by entrepreneurial support, personal attitude, family background, and gender (sex).

CONCLUSION AND RECOMMENDATIONS

Entrepreneurship courses have been progressively combined and taught in almost all fields of specialization in most academic circles including engineering degree programs at the Universities, tertiary institutions, and other levels of education. The factors that affect entrepreneurial intention among engineering students were found to include; attitude, entrepreneurial support, and environmental contexts, including personality traits, creativity, leadership, locus of control, and the need for achievement. The students' entrepreneurial intents are also attributed to their awareness and appreciation of supportive entrepreneurial contexts from diverse sources, including the government, which sponsors their studies. Their main challenge is entrenched on how to enhance the relevance of entrepreneurship theories as taught at the universities with practical realities to overcome the clamor that the education offered by the Universities do not prepare students to compete in the business practices compared to less educated people in business. Therefore, it is indispensable to integrate entrepreneurship courses within the engineering curriculum, enhance access to entrepreneurship incubation centers, and organize seminars to raise awareness about entrepreneurship and encourage more female students to enroll in engineering degree programs. It is essential to integrate entrepreneurship courses within the engineering curricular, raise awareness about entrepreneurship paybacks, encourage more female students to enroll in engineering degree programs and enhance access to entrepreneurship incubation centers. Future studies need to be undertaken to assess the pulling factors among students undertaking degrees in the engineering specialization and the outcomes from those factors concerning entrepreneurial intention.

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Iamreadytodoanythingtobeanentrepreneur	16.6774	20.936	.616	.453	.819

EntrepreneurialSupport

Variable/Construct	Scale Meanif Item Deleted	ScaleVariance if ItemDeleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach'sAlphaif Item Deleted
Itispossibletoaccessfinanceforstartingand running business in Tanzania	13.1129	18.296	.443	.307	.672
Therearesupportiveenvironmentandfriendlyphysicalinfrastructureforstarting andrunningbusinessesinTanzania	14.2419	17.860	.575	.390	.590
Governmentregulationsregardingrunningofbusinessesinthecountryaresupportive o entrepreneurs	13.8710	18.991	.441	.335	.671
Entrepreneurshipeducationwillenableme to start and run my own business in the future	12.0000	18.358	.508	.292	.630

RoleModels1

Variable/Construct	Scale MeanifItem Deleted	ScaleVariance if ItemDeleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach'sAlphaif Item Deleted
Wherehavebeenemployedpreviously?	10.6532	20.407	.844	.749	.961
Wherehasyourfatherbeenemployed/is employed?	10.3710	20.186	.918	.881	.948
Wherehasyourmotherbeenemployed/is employed?	10.4677	20.088	.918	.862	.948
Wherehasyourrolemodel(inthecontextof entrepreneurship) employed/is employed?	10.4113	20.228	.908	.832	.950
Wheredoyouenvisagetobeemployed?	10.3548	20.621	.871	.774	.956

In Table 6, all items related to entrepreneurial intents were deemed significant and were retained. However, the item "My professional goal is to be an entrepreneur was deleted to improve the Cronbach's alpha by 0.005. However, the item "My professional goal is to be an entrepreneur' was deleted to improve the Cronbach's alpha by 0.005. Deletion of other constructs reduced it, although their Cronbach"s alpha value was above 0.7. Concerning entrepreneurial support, the scale proved good internal consistency since the Cronbach"s alpha (α) = 0.704 and on the standardized item, α = 0.707. Cronbach's alpha (α) becomes unsuitable if any is deleted since the value drops below the threshold of 0.7. With respect to entrepreneurial role models, the children inherently imitate the behavior of the parents as their role models by emulating their characters. The showcase traits, e.g., the ability to inspire, having a clear set of values, and being selfless and committed to one's goals (Zhao, Jiang, Fang, & Weng, 2023), In the variable role mode, the scale used gave a good reliability Cronbach"s alpha (α = 0.95) and a similar value on a standardized item.

Table7:- InternalConsistencyTest.

InternalConsistency**Test**				
SN		Cronbach's Alpha	Cronbach'sAlphaBasedon StandardizedItems	NofItems
1	Entrepreneurialintention	.837	.846	4
2	EntrepreneurialSupport	.704	.707	4
3	Attitudinalsupport	.927	.929	12
4	RoleModels	.962	.962	5

Theentrepreneurialprocessiscomplexandcanbeinfluencedbynumerousfactorsthatlacka universallyagreed-uponsetofpersonalitytraits. Entrepreneurial intention reflects the states of mind that direct attention, experience,

and action towards a particular occupation or establishment of entrepreneurial initiatives. From Table 7, the scale for entrepreneurial intention proved reliable since the Cronbach"s alpha ($\alpha = 0.837$) and the standardized item Cronbach alpha ($\alpha = 0.846$).

CorrelationAnalysis (Variables'Association)

Numerous scholars perceive correlations as suitable since they can be used in assessing the joint variation among variables, the strength of the association, and statistical significance. Correlation is an essential tool of analysis in economics and business, where there is often a correlation among variables. Correlation analysis establishes the degree of existence and direction of relationship among variable**s** (Wang, 2014; Shipley, 2016; Black, 2023). Table 10 shows the correlation among variables.

Table10:-CorrelationMatrix.

		ENTRE_INT	SEX	SUPPORT	FAMILY
PearsonCorrelation	Entre-Int	1.000	.023	.564	-.104
	Sex	.733	1.000	.076	.052
	Support	.564	.076	1.000	-.053
	Family	-.104	.052	-.053	1.000
Sig.(1-tailed)	Entre-Int	.	.401	.000	.125
	Sex	.401	.	.201	.284
	Support	.000	.201	.	.281
	Family	.125	.284	.281	.
N	Entre-Int	124	124	124	124
	Sex	124	124	124	124
	Support	124	124	124	124
	Family	124		124	124

Key: ENTRE-INT = Entrepreneurial intention

There is a negative correlation between the variables „Entrepreneurial Support and Family Background' and between the variables 'Family Background' and 'Entrepreneurial Intentions'. The correlation between other variables is positive at $p \leq 0.05$. From table 10, variable „Sex"" has a significant value of 0.733, which is greater than 0.05. The correlation matrix indicates that there is no significant relationship between sex and entrepreneurial intent among engineering students. Similarly, there is no significant relationship between family background and students" entrepreneurial intent. Concerning awareness of entrepreneurial support initiatives, the significant value for the variable „Support" is 0.000, which is less than 0.05. Therefore, there exists a significant relationship between studentsperceived level of entrepreneurial support and their entrepreneurial intention. The study results show that entrepreneurial intent among engineering students is high.

I.   MultipleLinearRegression

The aim of multiple linear regression is to predict the dependent variables based on their covariance in relation to independent variables. Multiple linear regression enhances the ability to estimate the dependent variable and describe the accurate relationship with independent variables (Hickey, Kontopantelis,Takkenberg&Beyersdorf,2019). The summary of the regression model is presented in Table 8.

Table8:- Summaryofthemodel3.

Model	R	R²	Adjusted R²	Std.Error of the Estimate	ChangeStatistics				
					R² Change	F Change	df1	df2	Sig. F Change
1	.694ᵃ	.482	.464	.73182726	.482	27.665	4	119	.000
a.Predictors:(Constant),Sex,Attitude,Family,Support									

Multiple linear regression attempts to model the relationship between two or more dependent and independent variables by means of appropriate linear equation for the observed data (Adhikari, 2022). The values of independent variables by means of an appropriate linear equation for the observed data (Adhikari, 2022). The values of independent variables, i.e., sex, support, attitude, and family, were associated with entrepreneurial intentions (dependent variable). Thefitness of the model was tested by R^2, F-test, significance level, and additional coefficients. R^2 measured the extent to which the total variation of the dependent variable is explained

by the regression model (Shinnar, Hsu, Powell, & Zhou, 2018; Osborne & Waters, 2019). From Table 8, R2 = 0.482 (48.2%) of the variance of the dependent variable is explained by the independent variables. The model reaches statistical significance (Sig = 0.000 at $p \le 0.05$). The F value tells whether the model is significant, implying that it is an important predictor (Liu, Lin, Zhao & Zhao, 2019).

A histogram for the residuals of a regression model was created to validate the assumptions underlying the model, confirm that residuals are normally distributed, enhancestherobustness of the findings, and reinforce the credibility of the statistical inferences (Bernhardt, 2018). Regression histogram and plot of regression residual aredisplayed in Figure 4 and Figure 5.
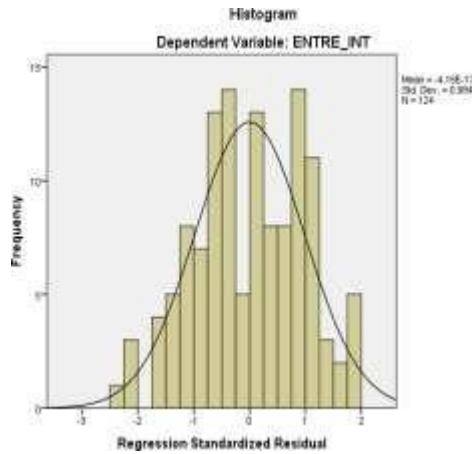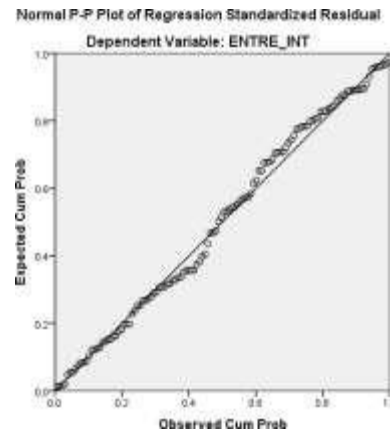

Figure4: -Regressionhistogram**.**

Figure5: -PlotofRegressionResidual.

Source: Statistical Primer: Checking model assumptions with regression diagnostics. Interactive cardiovascular and thoracic surgery, 28(1), 1-8.

A residual plot is a graph that shows the residuals on the vertical axis and the independent variable on the horizontal axis. It is at best for detecting outliers that need to be removed. If the points in a residual plot are randomly dispersed around the horizontal axis, a linear regression model is appropriate for the data; otherwise, a nonlinear model is more appropriate. Regression lines can be used as a way of visually depicting the relationship between the independent (x) and dependent (y) variables in the graph. A straight line depicts a linear trend in the data (i.e., the equation describing the line is of first order). While a raw residual is the difference between an observed value and a predicted value in a regression or other relevant statistical tool, a standardized residual is the raw residuals divided by an overall standard deviation of the raw residuals, which provides a consistent measure of the predicted error. A bell-shaped histogram indicates that the residuals are normally distributed and validates the key assumptions of regression analysis (Rocha, Shamarova, & Simas, 2016). Both the regression histogram and the plot of the regression residual validated the key assumptions of the regression mode, that there are no outliers.

Analysis of variance (ANOVA) and the model coefficients

Most scholars in entrepreneurship literature acknowledge the influence of prior experience on an individual's performance and that prior experience may be inherent or acquired through entrepreneurial endeavor. The analysis of variance (ANOVA) and the model coefficients are illustrated in Table 9.

Table9:- AnalysisofVariance(ANOVA)andtheModelCoefficients.

ANOVA						β coefficients					
Model	SS	df	MS	F	Sig.	Model	UnstandardizedCoefficients		StandardizedCoefficients	t	Sig
							B	Std.Error	Beta		
1 Regression	59.267	4	14.817	27.665	.000						
Residual	63.733	119	.536								
Total	123.000	123				(Constant)	.058	.187	-	.308	.759

						Support	.329	.077	.329	4.295	.000
a. DependentVariable:ENTRE_INT b. Predictors:(Constant),Sex,Attitude,Family,Support						Attitude	.461	.077	.461	6.024	.000
						Family	-.064	.066	-.064	-.974	.332
						a.DependentVariable:Entre_Int					

These findings are in line with those of Setiobudi and Herdinata (2018) and Sharma (2014), who posit that there is a significant difference between generations and biological constructs in relation to entrepreneurial intention. For the model coefficients, unstandardizedβ and the constant are included. The equation for the regression line can be expressed as: Entrepreneurship Intention = 0.58 + 0.329 (support) + 0.461 (attitude) -0.064 (family) -0.046 (sex). Therefore, entrepreneurial intention is somewhat influenced by entrepreneurial support, personal attitude, family background, and gender (sex).

Conclusion and Recommendations:
Entrepreneurship courses have been progressively combined and taught in almost all fields of specialization in most academic circles, including engineering degree programs at universities, tertiary institutions, and other levels of education. The factors that affect entrepreneurial intention among engineering students were found to include attitude, entrepreneurial support, and environmental contexts, including personality traits, creativity, leadership, locus of control, and the need for achievement.The students entrepreneurial intentions are also attributed to their awareness and appreciation of supportive entrepreneurial contexts from diverse sources, including the government, which sponsors their studies. Their main challenge is entrenched in how to enhance the relevance of entrepreneurship theories. The universities do not prepare students to compete in business practices compared to lesseducated people in business. Therefore, it is indispensable to integrate entrepreneurship courses within the engineering curriculum, enhance access to entrepreneurship incubators, and organize seminars to raise awareness about entrepreneurship and encourage more female students to enroll in engineering degree programs. It is essential to integrate entrepreneurship courses within the engineering curriculum, raise awareness about entrepreneurship paybacks, encourage more female students to enroll in engineering degree programs, and enhance access to entrepreneurial incubation centers.Future studies need to be undertaken to assess the pulling factors among students undertaking degrees in the engineering specialization and the outcomes from those factors concerning entrepreneurial intention.

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