

Cognitive competencies of TVE students as correlates of entrepreneurial intentions

By

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Abstract

In the face of the global economic challenges facing countries in the world and considering the fact that Nigeria is in a very critical phase of its development, it is imperative to produce graduates with high entrepreneurial intentions so as to salvage the already comatose economy. The study attempts to ascertain the relationship between cognitive competencies of Technology and Vocational Education (TVE) students and their entrepreneurial intentions. Six hypotheses were tested. The study adopts a survey design and 350 TVE students from tertiary institutions across the South-East region of Nigeria are studied. Purposive sampling method is used in selecting the sample for the study while a structured questionnaire is used for data collection. The instrument for data analyses is the Bivariate Pearson Correlation matrix and the simple linear regression tools. The study found out the creative skills, critical thinking skills and problem solving skills are significantly correlated to entrepreneurial intentions of TVE students.

Keynote: Cognitive competencies, critical thinking, creativity, social skills, technology skills, problem solving

Introduction

Entrepreneurship has been identified as very crucial to the development of any economy. It helps to boost the economy through innovative technologies, services, products and creates new opportunities for employment which foster growth. It is a key driver of innovation and measurable economic development in many countries (Montiel & Clark, 2018). Nigeria as a country needs to raise more entrepreneurs that will provide the much needed jobs to boost the economy. Entrepreneurial intention is the most vital predictor of how people will engage in entrepreneurial activity and establish a business in the future. Entrepreneurial intention is seen as a focused mentality that guides the individual's attention and experience towards planned entrepreneurial behaviour (Do & Dadvari, 2017). Entrepreneurship intentions are fostered by the confidence that one possesses the requisite skills, attitude and knowledge (cognitive competencies) required to start up a business venture. Technical and vocational education and training (TVET) programme prepares its recipients to become entrepreneurs by exposing them to a range of courses geared towards developing the requisite knowledge, skills, attitude and values.

TVET as defined in the Nigerian National policy on education refers to those aspects of the educational process involving, in addition to general education, the study of technologies and

related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life (FRN, 2013). It is designed to provide the knowledge and skills requisite for being economically self-reliant. Okoye and Arimonu (2016) asserted that TVET is designed to offer people the opportunity of improving themselves in their general proficiency, especially in relation to their present or future occupation. The level of competency acquired by an individual could promote their entrepreneurial intentions. There are various components of competency like knowledge; cognitive and practical skills, attitude, among others. However, cognitive competencies that can be taught and learnt within TVET programme are the focus of this study.

Cognitive competencies refers to the cyclical processes of assimilation and accommodation, which indicates that people can manipulate their personal experiences as well as organise and adapt their thoughts to guide their behaviour (Piaget in Sun & Hui, 2012). Vygotsky in Sun & Hui (2012) also averred that cognitive competence is an ability to internalize, self-regulate, and transfer cognitive skills to construct knowledge and make sense of the surroundings. Therefore, the place of cognitive competencies in shaping the intentions and consequent behaviour of a person cannot be undermined. An individual is said to possess cognitive competence when the person has the capability to use a set of related skills, knowledge and attitude as situation presents itself. Cognitive skills required in the 21st century include: critical thinking skills (Kassymova, 2018), problem solving skills, creativity skills (Sun & Hui, 2012), technology skills (Kivunja, 2015), social skills and information literacy skills (Kivunja, 2015). Considering the importance of these skills, the deteriorating nature of the economy, the high rate of unemployment even among TVET graduates and the urgent need to raise entrepreneurs, it is imperative that we examine how cognitive competencies emphasised in TVET programme actually relate with the entrepreneurial intentions.

The Theory of Planned Behaviour Model

The Theory of Planned Behaviour (TPB) was proposed by Ajzen (1985) through his article “From Intentions to Actions: A Theory of Planned Behavior.” According to the TPB Model, there are three attitude variables that affect entrepreneurial intention. They are: attitude toward the behaviour, subjective norms and perceived behavioural control. This theory is developed from the theory of rational action. Since it was put forward, it has been widely used in the research of belief, attitude, behaviour intention and other fields, having a significant impact particularly on consumption, public relations, health care, career choice and other predictions of social behavior. In recent years, due to the rise of entrepreneurship research in the world, the TPB has been rapidly applied to the research of entrepreneurship. Based on the TPB, entrepreneurial behaviour can be explained as follows: The level of entrepreneurial intention is related to the attitude to the behavioural intention of entrepreneurs (attitude toward the behaviour); the level of entrepreneurial intention is related to normative belief and compliance motivation (subjective norms); the level of entrepreneurial intention is related to control belief and perceived facilitating conditions (behavioral control). The manner of interaction determines the level of entrepreneurial activity an individual gets involved in.

Development of Research Model and Hypotheses

This section contains the research model (see Figure 1) and hypothetical propositions of all the major variables in the study. Specifically, the authors foretold the relationship between the

independent variable (i.e., TVET students' cognitive competencies) and the dependent variable (i.e., entrepreneurial intentions).

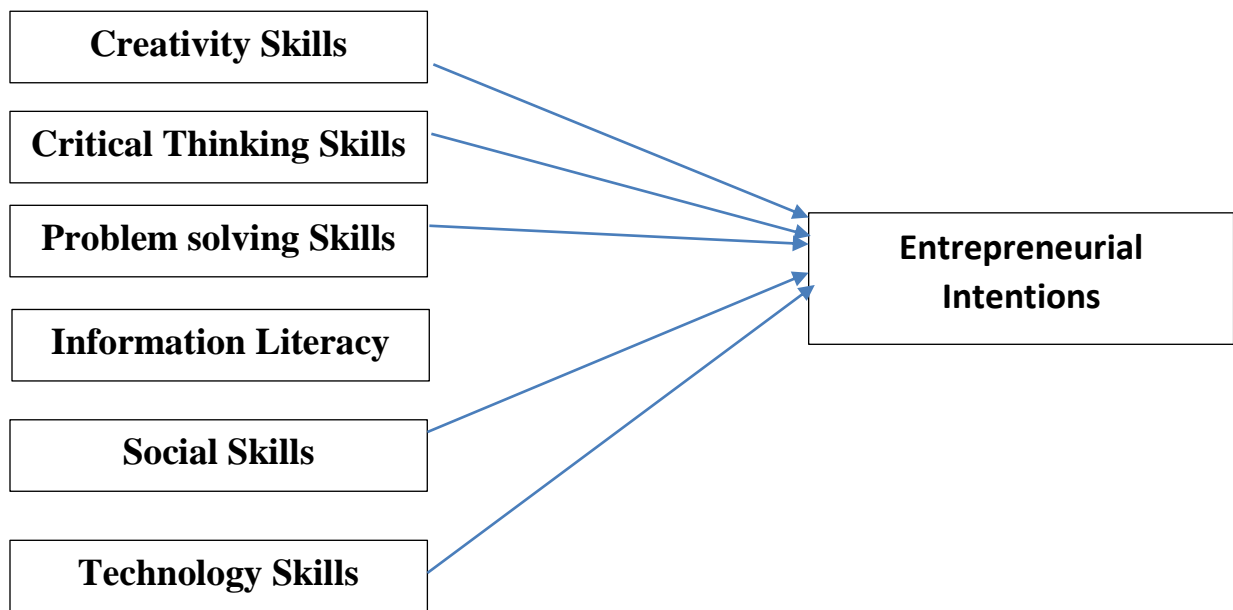


Figure I: Cognitive Competencies as correlates of Entrepreneurial Intentions

Source: Developed by the Authors

Creativity and Entrepreneurial Intention

Creativity has been defined by many scholars as the human ability to think, modify, discover, and create (Anjum, Amoozegar, Nazar & Kanwal, 2020); ability to generate new and valuable ideas by recombining and matching information and knowledge (Zhang and Zhang, 2018); the bringing into being of something which does not exist before, either as a product, idea, or a process. Creativity skills entails a combination of one's ability to see problems in a new way (nonconventional thinking), recognising which of the ideas is worth pursuing, and persuade people to believe and value one's ideas. Creativity has been grouped into five levels called taxonomy ranging from perfect imitation to original creation (Nilsson, 2013). To be successful as an entrepreneur, one has to be creative. Hence entrepreneurship is a creative activity. Chua and Bedford (2016) asserted that creativity in entrepreneurship refers to the ability to combine existing resources and generate innovative ideas. The possession of creative skills is expected to influence students' entrepreneurial intentions to venture into self-employment; therefore, the authors of this study hypothesized that:

Hypotheses 1: Creativity skills possessed by TVET students significantly correlate with their entrepreneurial intentions.

Critical Thinking skills and entrepreneurial Intention

Critical thinking skill is listed in the 21st century skill because of its critical role in shaping the society into what we hope for. Critical thinking:

“is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, or communication, as a guide to belief and action” (Paul cited in Sun & Hui, 2012).

Facione (2011) identified the core critical thinking skills and sub skills to include: interpretation (categorizing, decoding significance and clarifying meaning), analysis (examining ideas, identifying arguments, analyzing arguments), evaluation (assessing claims, and assessing arguments), inferences (querying evidence, conjecturing alternatives and drawing conclusions), explanation (stating results, justifying procedures and presenting arguments) and self-regulation (self- examination and self- correction). The possession of critical thinking skills is expected to influence students’ entrepreneurial intentions to venture into self-employment; therefore, the authors of this study hypothesized that:

Hypotheses 2: Critical thinking skills possessed by TVET students is significantly correlated with their entrepreneurial intentions.

Problem Solving skills and Entrepreneurial Intention

An entrepreneur must be able to proffer solution to the existing problems in the society in the form of idea, product or service as well as handle the daily problems associated with the running of a business. Barron and Harrington as cited in Kim, Choi, Sung and Park (2018) asserted that problem solving ability is a key element of innovative behaviour in responding to rapid changes with the ability to find various alternatives and predict outcomes from the alternatives to maximize positive results, minimize negative consequences, and select solutions to problems. Problem solving process involves four fundamental stages: defining the problem, scouting for alternatives, evaluating the alternatives and implementing the most suitable solution. The possession of problems solving skills is expected to influence students’ entrepreneurial intentions. Therefore, the authors of this study hypothesized that:

Hypotheses 3: Problem solving skills possessed by TVET students significantly correlate with their entrepreneurial intentions.

Technology Skills and Entrepreneurial Intentions

The global economy is becoming more dependent on digital technology. According to Stambler (2013), technology skills refers to the ability to use digital technology, communication tools or networks to locate, evaluate, use and create information. Technology skills are sometimes referred to as digital literacy skills or ICT skills (Kivunja, 2015). The ability to develop technology skills that align with market demand increases the chances of achieving greater success in business. The possession of technology skills is expected to influence students’ entrepreneurial intentions; therefore, the authors of this study hypothesized that:

Hypotheses 4: The technology skills possessed by TVET students significantly correlate with their entrepreneurial intentions.

Social Skills and Entrepreneurial Intentions

Social skills are a collection of learned behaviours that gives the individual the ability to have an influential relationship with others and to abstain from socially unreasonable reactions (Agran, Hughes, Thomas, & Scott, 2016; Davies, Cooper, Kettler & Elliott, 2015; Gresham, 2016). Johnson (2016) grouped social skills into 4 types: survival (following directions, listening to orders and obeying rules), interpersonal (such as empathy, sharing and relationships, learning collaboratively), problem solving (taking responsibilities, decision making, independence seeking) and conflict resolution skills (coping with difficulties and apologizing). An entrepreneur's social skill is believed to influence a myriad of entrepreneurial outcomes including entrepreneurial intention.

Social skills build essential character traits like trustworthiness, respectfulness, responsibility, fairness, caring, and citizenship. These traits help to build an internal moral compass, allowing individuals to make good choices in thinking and behavior, resulting in social competence that can facilitate entrepreneurial intentions. The possession of social skills is expected to influence students' entrepreneurial intentions to venture into self-employment; therefore, the authors of this study hypothesized that:

Hypotheses 5: The social skills possessed by TVET students significantly correlate with their entrepreneurial intentions.

Information Literacy Skills and Entrepreneurial Intentions

Information literacy entails the ability to access and retrieve information effectively in order to solve problems and make decisions. Apriyanti cited in Agus, Rakib, Jufri, Utani and Sudarmi (2021) reveals that someone is said to have information literacy skills if that person is capable of realising their information needs, identify potential sources of information, build strategies for appropriate search, access various sources of information including other basic technologies, evaluate information, manage information in its implementation, integrate new information with the old knowledge they already have and use critical information to solve problems.

Agus, Muhammed, Muhammed & Nural (2021) found out that information literacy partially has an effect on entrepreneurial intentions and entrepreneurship education in family and information literacy has positive significance on the entrepreneurial interest of students. The possession of information literacy skills is expected to influence students' entrepreneurial intentions; therefore, the authors of this study hypothesized that:

Hypotheses 6: The Information Literacy skills possessed by TVET students significantly correlate with their entrepreneurial intentions.

Methodology

The study adopts a survey design. 350 students from tertiary institutions offering TVET in South-East geopolitical region of Nigeria were purposively selected. The rationale for utilizing the purposive sampling technique is to avoid coercing the respondents to respond to the instruments which might affect the outcome of the study.

The instrument was a 5-point Likert scale questionnaire which was partly adapted from existing scales. The section on entrepreneurial intention was adapted from Linan and Chen (2009) while the

section on creativity was adapted from Kumar and Holmam (1997) revised version. The instrument consists of 54 items, ranging from 5 (strongly agreed) to 1 (strongly disagree). Items 1 to 10 assessed CS, items 11 to 19 assessed CTS, items 20 to 26 assessed PS, items 27 to 33 assessed TS, items 34 to 40 assessed SS, and items 41 to 48 assessed ILS while 49 to 54 assessed EI. For instance, a sample of the items raised for creativity skills is “I possessed the abilities to turn new and useful ideas into a marketable product and service”. A sample of the items raised for critical thinking skills is “I am usually inquisitive in regards to a wide range of issues”. A sample of the items raised for problem solving skills is “I have the ability to create a design solution to any problem.” A sample of the items raised for entrepreneurial intentions is “My ultimate goal is to become an entrepreneur. The reliability of the instrument was tested using Cronbach Alpha and a reliability coefficient of 0.86 was obtained. The data obtained from the respondents were analyzed using the IBM Statistical Package for the Social Scientists (SPSS) version 22.0. The Bivariate correlation matrix and simple linear regression statistical tools were used to analyze the relationship between the independent variables (i.e. TVE cognitive competencies) and the dependent variable (i.e entrepreneurial intentions) of the study.

Results

The results of the data analyzed are presented in Tables 1 to 10.

Table 1: Mean, Standard Deviations and Bivariate Pearson Correlation of the Study Variables

SN	Variables	M	SD	CS	CTS	PSS	TS	SS	ILS	EI
1	CS	3.26	.48	1						
2	CTS	3.27	.45	.774**	1					
3	PSS	3.26	.52	.767**	.658**	1				
4	TS	3.21	.57	.778**	.766**	.648**	1			
5	SS	3.23	.52	.585**	.784**	.435**	.695**	1		
6	ILS	3.39	.44	.591**	.649**	.488**	.713**	.576**	1	
7	EI	3.32	.53	.459**	.351**	.447**	.585**	.274**	.775**	1

Note: N = 350, M = Mean, SD = Standard Deviations, CS = Creativity Skills, CTS = Critical thinking Skills, PSS = Problem Solving Skills, TS = Technology Skills, SS = Social Skills, ILS= Information literacy Skills, EI = Entrepreneurial Intentions.

The results presented in Table 1 showed the correlations between the study variables. The Table showed that the Mean responses of TVE students ranged from 3.21 to 3.39, while the Standard Deviation values ranged from .44 to .57. The table also showed that the correlation coefficient of between the study variables ranged from .274 to .778. These results are indications that TVET students’ cognitive competencies positively correlates with entrepreneurial intentions.

Research Hypothesis 1: Creativity skill is significantly correlated with entrepreneurial intentions.

Table 2: Simple linear regressions of creativity skills as correlate of entrepreneurial intentions.

Creativity Skills → Entrepreneurial Intentions					
	B	SEB	Beta	T	P
Constant	1.673	.172		9.702	.000
CS	.503	.052	.459	9.635	.000

Note. R2 = .21, Adjusted R2 = .20, F = 92. 827, p =.000

The results in Table 2 revealed that creativity skills possessed by TVE students is significantly correlated with their entrepreneurial intentions ($F = 92.827$, $t = 9.635$, $\beta = .459$, $p = .000$). The Table also revealed that the adjusted R-square (.020) depicts that 02.0% of variances in the intentions of TVE students to venture entrepreneurship after school is determined by acquisition of creativity skills. Therefore, the research hypothesis is supported, which further implies that TVET students who possessed creativity skills will be motivated to set up their own business after school. *Research Hypothesis 2: Critical thinking skill is significantly correlated with entrepreneurial intentions.*

Table 3: Simple linear regressions of critical thinking skills as correlate of entrepreneurial intentions.

Critical thinking Skills → Entrepreneurial Intentions					
	B	SEB	Beta	T	P
Constant	1.965	.195		10.082	.000
CTS	.413	.059	.351	6.994	.000

Note. R2 = .12, Adjusted R2 = .12, F = 48. 921, p < .005

The results in Table 3 revealed that the critical thinking skills possessed by TVE students is significantly correlated with their entrepreneurial intentions ($F = 48.921$, $t = 10.082$, $\beta = .351$, $p = .000$). The Table also revealed that the adjusted R-square (.012) depicts that 01.2% of variances in the intentions of TVE students to venture entrepreneurship after school is determined by acquisition of critical thinking skills possessed by TVE students is significantly correlated with their skills. This implies that TVET students who possessed critical thinking skills will be motivated to set up their own business immediately after school.

Research Hypothesis 3: Problem solving skill is significantly correlated with entrepreneurial intentions.

Table 4: Simple linear regressions of problem solving skills as correlate of entrepreneurial intentions

Problem Solving Skills → Entrepreneurial Intentions

	B	SEB	Beta	T	P
Constant	1.831	.161		11.354	.000
PSS	.456	.049	.447	9.324	.000

Note. R2 = .20, Adjusted R2 = .19, F = 89.940, p < .005

The results in Table 4 revealed that the problem solving skills possessed by TVE students is significantly correlated with their entrepreneurial intentions ($F = 89.940$, $t = 11.354$, $\beta = .447$, $p = .000$). The Table also revealed that the adjusted R-square (.019) depicts that 01.9% of variances in the intentions of TVE students to venture entrepreneurship after school is determined by acquisition of problem solving skills possessed by TVE students is significantly correlated with their skills. Therefore, the research hypothesis is supported, which further implies that TVET students who possessed problem solving skills will be motivated to set up their own business immediately after school.

Research Hypothesis 4: Technology skill is significantly correlated with entrepreneurial intentions.

Table 5: Simple linear regressions of technology skills as correlate of entrepreneurial intentions

Technology Skills → Entrepreneurial Intentions					
	B	SEB	Beta	T	P
Constant	1.575	.131		11.982	.000
TS	.542	.040	.585	13.455	.000

Note. R2 = .34, Adjusted R2 = .34, F = 181.026, p < .005

The results in Table 5 reveal that the technology skills possessed by TVE students is significantly correlated with their entrepreneurial intentions ($F = 181.026$, $t = 11.982$, $\beta = .585$, $p = .000$). The Table also reveals that the adjusted R-square (.34) depicts that 3.4% of variances in the intentions of TVE students to venture entrepreneurship after school is determined by acquisition of technology skills possessed by TVE students is significantly correlated with their skills. Therefore, the research hypothesis is supported, which further implies that TVET students who possessed technology skills will be motivated to set up their own business immediately after school.

Research Hypothesis 5: Social skill is significantly correlated with entrepreneurial intentions.

Table 6: Simple linear regressions of social skills as correlate of entrepreneurial intentions

Social Skills → Entrepreneurial Intentions					
	B	SEB	Beta	T	P
Constant	2.424	.170		14.246	.000
SS	.276	.052	.274	5.316	.000

Note. R2 = .075, Adjusted R2 = .072, F = 28.255, p < .005

The results in Table 6 revealed that the social skills possessed by TVE students is significantly correlated with their entrepreneurial intentions ($F = 181.026$, $t = 11.982$, $\beta = .585$, $p = .000$). The Table also revealed that the adjusted R-square (.34) depicts that 3.4% of variances in the intentions of TVE students to venture entrepreneurship after school is determined by acquisition of social skills possessed by TVE students is significantly correlated with their skills. Therefore, the research hypothesis is supported, which further implies that TVET students who possessed social skills will be motivated to set up their own business immediately after school.

Research Hypothesis 6: Information literacy skill is significantly correlated with entrepreneurial intentions.

Table 7: Simple linear regressions of information literacy skills as correlate of entrepreneurial intentions

Information literacy Skills → Entrepreneurial Intentions					
	B	SEB	Beta	T	P
Constant	.220	.136		1.610	.108
ILS	.919	.040	.775	22.897	.000

Note. R2 = .601, Adjusted R2 = .600, F = 524. 272, p >.000

The results in Table 6 revealed that the information literacy skills possessed by TVE students is not significantly correlated with their entrepreneurial intentions ($F = 181.026$, $t = 11.982$, $\beta = .585$, $p >.000$). The table also revealed that the adjusted R-square (.60) depicts that 6.0% of variances in the intentions of TVE students to venture entrepreneurship after school is determined by acquisition of information literacy skills possessed by TVE students is significantly correlated with their information literacy skills. Therefore, the research hypothesis is rejected, which further implies that that there is no significant correlation between information literacy skills and entrepreneurial intentions among TVE students.

Discussion

The study establishes the relationship between students' cognitive competencies and their entrepreneurial intentions. The goal of the study is to lay emphasis on the need to acquire or possess relevant cognitive competencies required for starting and managing entrepreneurship ventures also the study lend a voice to the relevance of cognitive competencies for entrepreneurial intentions.

From hypothesis 1, it was found that creativity skills possessed by TVE students is not significantly correlated with their entrepreneurial intentions to set up their own business after school. This findings support the study conducted by Temoor, Muhammad, Petra and Julián (2021) which states that entrepreneurship's cognitive perspective sheds light on the importance of creativity disposition, which is the inherent quality of an individual to create a novel idea—cultivating EI of individuals. Temoor, Muhammad, Petra and Julián further state that creativity skills is recognised as an essential element of entrepreneurship as the individuals have to be creative to identify and exploit the opportunities. Furthermore, Hamidi, Wennberg and Berglund (2008) incorporated creativity to individuals' entrepreneurial intentions Hamidi, Wennberg and Berglund introduce creativity in the entrepreneurial intention model. Hamidi, Wennberg and Berglund (2008) found a positive link between creativity skills and Entrepreneurial intentions.

The test of hypothesis 2 reveals that the level of critical thinking skills possessed by TVE students is significantly correlated with their entrepreneurial intentions. This finding supports the study conducted by Mugor (2017) and Edokpolor and Abusomwan (2019) that shows a significant correlation between and among critical thinking skills and TVET students' intentions to start-up a self-employed business. Also Igwe, Okolie and Nwokoro (2019) assert that potentials like critical thinking inspire the expression of entrepreneurial intentions among student. This is an indicator that critical thinking skill is a requisite skill for starting up a self-employed business.

The outcome of hypothesis 3, shows a significant correlation between problem solving skills and TVE students' intentions to venture into business. The result of the present study supports the findings of Dyer, Gregersen and Christensen (2011); IBM (2010) that problem solving skills are very valued skills related to entrepreneurial intentions. This results implies that TVE programme have the capability of cognitive competencies like problem solving skills which strongly influence entrepreneurial intentions among students.

Hypothesis 4 reveals that technology skills possessed by TVE students is significantly correlated with their entrepreneurial intentions to start-up a business after graduation. This result is consistent with the findings of Mathews and Pardue (2009). Maceli and Burke (2016) further reveal that technology skills is highly relevant for entrepreneurship set up and 21st century place of work.

Based on the outcome of hypothesis 5, the study shows a significant correlation between social skills and TVE students' entrepreneurial intentions to set up a business. This finding is supported by the study of Kinyua (2013) indicating social skill is largely recognised as crucial in shaping entrepreneurial intention. However, Edokpolor and Abusomwan, (2019) found out that the level of social and cross-cultural skills is not significantly related to students intentions of being self-employed after graduation.

Hypothesis 6 reveals that information literacy skills possessed by TVE students do not significantly influence their intentions to set up a business upon graduation. Chabongwa (2018) also reveals that TVET graduates are not experienced, and they do not have the requisite skills (including, information literacy skills) to operate their own businesses and some exhibit lackadaisical attitude towards entrepreneurship venturing since they do not want to become risk takers and product innovators. On the contrary, Agus, Muhammed, Muhammed and Nural (2021) find that information literacy partially has an effect on entrepreneurial intentions. Also, Edokpolor and Abusomwan (2019) find that ICT literacy skills possessed by students is significantly correlated with their intentions to start-up a self-employed business.

Limitation of the Study

This study contributes to the relevant knowledge on cognitive competencies of TVE students as correlates of entrepreneurial intentions. The specific purposes of the study were achieved and the hypotheses were tested, although some limitations were spotted out. The study was conducted via a non-experimental procedure (survey design), causal inference could not be made in the study. Also, the population of the study focused on TVET students in south east. Students from other geographical zones and other programmes could be studied in order to get a result that can be generalised.

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