



# Technological Predictors of Technopreneurship Engagement Among Nigerian Undergraduates: Policy Imperatives

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## Abstract

This study investigated some predictors namely technological attitudes, skills, and knowledge (t-ASK) in relation to technopreneurship engagement among Nigerian undergraduates. The descriptive research design was used. The study was piloted by two research questions and one null hypothesis. The target population comprised all 24, 183 undergraduates at the University of Lagos, out of which 206 were selected through stratified random sampling technique. A self-designed, validated, and reliable instrument ( $r=.88$ ) entitled "Technopreneurship Engagement Scale (TES)" was used for data collection. Methods of data analysis were Multiple Regression and Independent t-test. Findings showed that the joint contributions of t-ASK to the variance in technopreneurship engagement was 11.3%. Finding further showed that technological attitudinal made the highest contribution ( $\beta=.219$ ), followed by technological knowledge ( $\beta=.137$ ), and then, technological skills ( $\beta=-.087$ ) to the variance in technopreneurship engagement. There was also significant difference in technopreneurship engagement among male and female Nigerian undergraduates ( $t=-2.376$ ;  $df=204$ ,  $p<.05$ ). Selected predictors are 'sine qua non' to successful technopreneurship engagement among Nigerian undergraduates. We therefore recommend among others that students should be encouraged to develop positive technological attitudes towards technopreneurship which made the highest relative and significant contribution.

**Keywords:** 1; Technological Attitudes 2; Technological Knowledge 3; Technological Skills 4; Technopreneurship Engagement

## 1. Introduction

In this era of increasing awareness of the importance of technology, a new concept which involves human innovations with the help of technology for individual and national socio-economic development has emerged. This emerging concept is called Technopreneurship. Technology entrepreneurship in the last four decades, has become an increasingly important global phenomenon. This is not unconnected with its perceived necessity for growth, differentiation, and competitive advantage at the firm, regional, and national levels. According to Bailetti (2012), technology entrepreneurship can be described as a vehicle that facilitates prosperity in individuals, firms, regions, and nations.

Technopreneurship is a new breed of entrepreneurship. It involves coming together of people who are intelligent, creative, technology savvy and passionate and have an appetite for calculated risk. Technopreneurship is entrepreneurship within the context of intensive technology. It refers to the process of integrating technologies into entrepreneurial talents and skills such that technologies become an integral part in the transformation of goods and services (Bailetti, 2012). A technopreneur is therefore a person who revolutionizes the prevailing economic order by making the best use of technology at hand. Bill Gates (Microsoft), Steve Jobs (Apple), Sergey Brin and Larry Page (Google), Mark Zuckerberg (Facebook), Jack Dorsey (Twitter), Kevin Systrom (Instagram) are famous examples of technopreneurs.

There have been several studies that had attempted to interrogate the possible determinants of technopreneurship, especially among the young ones with diverse results. The roles of attitude in human endeavours cannot be over emphasised. Ajzen, Czasch, and Flood (2009) observed that attitude toward a behaviour is the degree to which a person has a favourable or unfavourable evaluation or appraisal of the behaviour in question. Technological attitudes is therefore an important factor that was investigated in this study. Attitudes toward technologies may differ depending on the population's characteristics such as socioeconomic status, previous experiences with technology, and the type of technology itself (Øyen et al., 2017). According to Liñán and Chen (2009, p. 596), "attitude toward start-up is the degree to which the individual holds a positive or negative personal valuation about being an entrepreneur." Liñán and Chen's study confirmed a positive and significant relationship between technological attitudes of the youth and their intentions to undertake business enterprise, especially those that have to do with technology.

Pavlova (2005) also recognised knowledge within technology as a vital determinant of technopreneurship engagement, and it includes knowledge about objects and processes. Knowledge of processes includes the processing of different materials, simplified design processes, maintaining, using, and so on, that should be considered in different domains, for instance, artisan skills, technical maxims and technological and scientific theories.

The roles of youth in the socio-economic, and political development of any country cannot be under-estimated. This is due to the fact that they are usually the active and productive section of the population. Members of this vital segment of the population seems to have been exposed to entrepreneurship so as to reduce the perceived high rate of unemployment among them. Egunsola, et al., (2012) submitted that among the most chosen alternative solution to unemployment issues among the youth is entrepreneurship.

However, in an emerging Society 5.0., there appears to have been a paradigm shift from entrepreneurship to technopreneurship as a decisive factor for economic development and as key enabler of innovation. With the advent of emerging technologies, there is the need for re-orientation among the youths towards technopreneurship. Based on the above background, it then presupposes that there is an urgent dire need for a study that will suggest possible technological factors which are capable of predicting in technopreneurship engagement. In their submission, Vamvaka, et al., (2020) remarked that researchers like Hindle, Klyver, and Jennings (2009) have started theorizing and focusing, since many years ago, their attention on developing models for understanding and potentially predicting entrepreneurial behaviour. The need to bridge this lacuna motivated the Researchers to conduct this study which investigated some technological predictors (namely technological attitude, skills, and knowledge) of technopreneurship among undergraduates at the University of Lagos, Nigeria.

The broad purpose of this study investigated the technological predictors (namely technological attitude, skills, and knowledge) technopreneurship among undergraduates at the University of Lagos, Nigeria in an emerging society 5.0. Specifically, the objectives of the study are to:

- a. examine the joint contributions of technological attitudinal, technological skills, technological knowledge (t-ASK) in predicting technopreneurship engagement.

- b. determine the relative contributions of technological attitudinal, technological skills, technological knowledge (t-ASK) to the variance in technopreneurship engagement.
- c. find out difference in technopreneurship engagement between male and female Nigerian undergraduates.

Based on the above specific objectives, two research questions were raised and answered while one null hypothesis was formulated and tested so as to guide the study. These research questions and the hypothesis are:

- a. What is the joint contribution of technological attitudinal, technological skills, technological knowledge (t-ASK) in predicting technopreneurship engagement?
- b. What are the relative contributions of technological attitudinal, technological skills, technological knowledge (t-ASK) to the variance in technopreneurship engagement?
- c. Technopreneurship engagement between male and female Nigerian undergraduates is not significantly different.

## 2. Methods

The descriptive research design was used for the study, with target population of all 24, 183 undergraduates in the selected Nigerian university. The sample size consisted of 206 participants who were selected through stratified random sampling technique. A self-designed, validated, and reliable instrument ( $r=.88$ ) entitled “Technopreneurship Engagement Scale (TES)” was used for data collection. This instrument is made up of eight Sections. Section A sought the demographic background of the respondents, while Sections B-E sought information on each of the sub-scales of t-ASK, and technopreneurship engagement. Multiple Regression was used to answer the two research questions, while Independent t-test was used to test the only null hypothesis in the study.

## 3. Results And Discussion

### 3.1. Result

#### 3.1.1. Research Question 1

What is the joint contribution of technological attitudinal, technological skills, technological knowledge (t-ASK) in predicting technopreneurship engagement?

**Table 1. Joint Contribution of the Selected Technological Attitudinal, Technological Skills, Technological Knowledge to the Prediction of Technopreneurship Engagement**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.348 <sup>a</sup>	.121	.113	1.85078

a. Predictors: (Constant), Technological Knowledge, Technological Skills, Technological Attitudinal

Multiple regression analysis was used to determine the joint contribution of the selected factors to the prediction of technopreneurship engagement among Nigerian undergraduates. From Table 1, it was revealed that the Adjusted R Square value of .113 indicated technological attitudinal, technological skills, and technological knowledge jointly contributed 11.3% of the variance in the technopreneurship engagement.

However, in order to determine the significance or otherwise of this obtained Adjusted R Square value, Analysis of Variance was run.

**Table 2. F Value of the Adjusted R Square of t-ASK**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	157.007	3	52.336	15.279	.000 <sup>b</sup>
	Residual	1137.231	332	3.425		
	Total	1294.238	335			

a. Dependent Variable: Technopreneurship Engagement

From Table 2, the F-value of 15.279 at degrees of freedom 3, 332 was significant ( $p < .05$ ). This clearly indicated that the joint contribution of the selected explanatory t-ask to the prediction of technopreneurship engagement among Nigerian and Indonesian undergraduates was significant. These explanatory factors should always therefore be taken very seriously in the determination of technopreneurship engagement

### 3.1.2. Research Question 2

What are the relative contributions of technological attitudinal, technological skills, technological knowledge (t-ASK) to the variance in technopreneurship engagement?

**Table 3. Relative Contributions of the Selected t-ASK to the Variance in Technopreneurship Engagement**

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients		
1	(Constant)	4.329	.511		8.470	.000
	Technological Attitudinal	.164	.045	.219	3.681	.000
	Technological Skills	.075	.049	.087	1.540	.124
	Technological Knowledge	.105	.049	.137	2.128	.034

a. Dependent Variable: Technopreneurship Engagement

Further more, regarding relative contributions of these selected explanatory factors to the variance in technopreneurship engagement, Table 3 showed that technological attitudinal made the highest contribution ( $\beta = .219$ ), followed by technological knowledge ( $\beta = .137$ ), and then, technological skills ( $\beta = .087$ ). However, only the contribution of technological skills was not significant ( $p > .05$ ).  $H_{01}$ : Technopreneurship engagement between male and female Nigerian undergraduates is not significantly different.

**Table 4. Technopreneurship Engagement between Male and Female Nigerian Undergraduates**

Variable	Gender	X	SD	N	df	t	P	Remark	Decision
Technopreneurship Engagement	Male	7.10	1.06	206	204	-2.104	.010	Sig	Failed to accept H0
	Female	7.76	2.16						

Student t-test was run to determine significant difference in technopreneurship engagement between male and female Nigerian undergraduates. From Table 4, it was revealed that there was a significant difference ( $t = -2.104$ ;  $df = 204$ ,  $p < .05$ ), and that technopreneurship engagement among female undergraduates seem more favourable compared to their male

counterparts. The Researchers therefore failed to accept the hypothesis that was postulated that technopreneurship engagement between male and female Nigerian undergraduates is not significantly different

### **3.2. Discussion**

Result from research question number one which probed into joint contribution of technological attitudinal, technological skills, and technological knowledge (t-ASK) in predicting technopreneurship engagement showed that these selected factors jointly contributed 11.3% of the variance in technopreneurship engagement, and this joint contribution was significant (F value of 15.279 at degrees of freedom 3, 332;  $p < .05$ ).

This supported the findings of studies conducted by Berge and Muilenburg (2013) and Wankel and Blessinger (2013). These two studies argued that the use of technology could help develop participation of students in technopreneurship, with the works suggesting that the use of technology could be an effective driver of technopreneurship engagement. According to Palloff and Pratt (2013), the literature agree that technology was not just a fad but had a central role to play in the education of students in modern society. Invariably, technological attitudinal, skills, and knowledge are some of the key predictors of technopreneurship engagement.

In terms of research question number two that inquired into relative contributions of technological attitudinal, technological skills, technological knowledge (t-ASK) to the variance in technopreneurship engagement, finding revealed that technological attitudinal made the highest contribution ( $\beta = .219$ ), followed by technological knowledge ( $\beta = .137$ ), and then, technological skills ( $\beta = -.087$ ). This finding also underscored the vital roles of attitudes in human undertakings generally.

Batra & Ahtola (as cited in Taha, Ramlan, & Noor, 2017) see the attitude of individual as couple dimensional, which includes both of hybridization and benefit values. Moreover, attitudes are the extent to which an individual has assessment of a given behaviour. Additionally, Bagozzi (as cited in Taha, Ramlan, & Noor, 2017) defined attitude as the process of functional and analyzing in order to improve and evaluate the practices of beliefs.

Liñán and Chen's (2009) study had earlier confirmed a positive and significant relationship between technological attitudes of the youth and their intentions to undertake business enterprise, especially those that have to do with technology. Also, according to Krueger, et al. (2000), attitude was found as a factor that affects entrepreneurial intention of university students.

The literature stated that a major obstacle could be the personal attitudes of the students toward the implementation of technology (Vrasidas & Glass, 2005). Researchers such as Yol et al. (2006); Rojas-Mendez and Parasuraman (2015); and Øyen et al. (2017) argued further that attitudes toward technologies may differ, depending on the population's characteristics (such as socioeconomic status, previous experiences with technology) and the type of technology itself

Pavlova (2005) also recognised knowledge within technology (herein referred to as technological knowledge) as a vital determinant of technopreneurship. The fact that the participants in the study are members of Generation-Z who have been classified as Digital

natives, could be the reason for the findings generated in our study. They are technological savvy, and this boosts their technological attitudes, skills, and knowledge.

In addition, the result from the hypothesis which stated that technopreneurship engagement between male and female Nigerian undergraduates is not significantly different showed that there was a significant difference ( $t=-2.376$ ;  $df=334$ ,  $p<.05$ ), and that technopreneurship engagement among female undergraduates seem more favourable compared to their male counterparts. Although, results from previous studies concerning gender differences are fairly inconsistent, finding from this study is in disagreement to those earlier reported in some studies. For instance, based on the meta-analysis of Cai et al. ([2017] incorporating scientific results from 1997 to 2014 established that males overall hold more favorable perceptions about new technologies. A considerable amount of research has further provided evidence that women are less open to new technologies (Rojas-Mendez et al., 2017; Rojas-Mendez & Parasuraman, 2015; Zhou et al., 2007).

Some probable reasons that could be adduced for this noticeable difference may be due to basic differences in fields of interest (Billington et al., 2007) or that women consider these innovations less socially useful (Cai et al., 2017), experience higher levels of anxiety (Venkatesh & Morris, 2000), and lower levels of self-efficacy (Cai et al. (2017).

#### **4. Conclusion**

In this study, it was found out that the selected factors namely technological attitudinal, technological skills, technological knowledge (t-ASK) are very critical in the determination of technopreneurship engagement. This study has underscored the predictive power of technological attitudinal, technological skills, technological knowledge (t-ASK) on technopreneurship engagement. Based on the findings generated from this study, we hereby recommend as follows:

1. Institutional authorities should encourage students to have positive attitudinal dispositions toward technopreneurship. This is because technological attitudes had been found to make the highest significant contributions to technopreneurship engagement.
2. Students need to work on their technological skills which was found to have contributed lowest to technopreneurship engagement.

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