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Antecedents of Graduates' Technopreneurial behaviors: Co-variance analysis based on the unified theory of acceptance and use of technology 2

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ABSTRACT

Technological skills and access to finance are major indicators of graduate entrepreneurial behaviors. They are also among the most challenging factors for creating new technology-based venture. Although the integration of technology readiness (TR) and financial literacy (FL) toward technopreneurial behavior (TB) has not been investigated, evidence in the literature supports their relationships. This paper investigates the combined role of TR and FL on technopreneurial intention (TI) and behavior. A cross-sectional survey was carried out and data was collected from 226 graduates. Statistical Package for the Social Sciences (SPSS) and Structural Equation Modeling (SEM) with Analysis of Moment Square (AMOS) graphics were used to analyzed a model with four-stage mediations. The findings show that TI is a full mediator on the relationship between TR (optimism and innovativeness) and TB. Similarly, it is a full mediator on the relationship between FL and TB. However, TI does not mediate the relationship between TR (discomfort and insecurity) and TB. The paper is the first to investigate the mediating effect of TI on the relationship between TR and TB as well as FL and TB among graduate using unified theory of technology acceptance and use (UTAUT 2). This research offers insights toward new technology-based firms' creation. Equally, it has practical implications for graduate students, institutions of higher learning, formal financial institutions, and policy makers regarding technopreneurial development.

Keywords: Technology entrepreneurship, technology readiness, financial literacy, graduates technopreneurial behavior.

1. INTRODUCTION

Changes in consumers' buying behavior are opportunities for technology entrepreneurship (TE). The increasing rates at which consumers accept and use new technology demonstrate that the future of SMEs depend on technopreneurship. It is thus not surprising that TE is an interesting entrepreneurial research subject to academics, practitioners, and policy-makers.

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TE is a key driver of change, a source of organizational competence, and commercialization for value creation with individual, micro, and macro benefits (Zahra and Hayton 2004). However, creating new technology-based firms remain a challenge in technologically-disadvantage economies. Therefore, a starting point is to investigate the readiness of an active, technologically-skilled, but structurally unemployed graduate segment of a population. The Unified Theory of Acceptance and Use of Technology 2 (UTAUT 2) (Venkatesh, James, and Xu 2012) shows that intention to act is proximal to behavior as long as person has rational or systematic control over its dimensions. Similarly, self-determination theory examines the extent to which a person's behavior is self-motivated. The theory posits that people must continually satisfy the needs for autonomy, competence, and relatedness to experience personal growth and well-being.

Although Liñán, Rodríguez-cohard, and Rueda-cantuche (2011) argued that education promotes entrepreneurship development, Marques, Ferreira, Gomes, and Rodrigues (2012) suggested a non-significant effect of education and entrepreneurial intention (TI). Though the relationships among TR, FL, TI, and TB have rarely been investigated, evidence in the literature supports their relationships. For example, Ferreira, da Rocha, and da Silva (2014) found that TR influence cognitive and affective attitudes toward adoption of new technology. Abreua and Mendes (2010) showed that FL has significant impact on investment behavior. Similarly, Solesvik, Westhead, Kolvereid, and Matlay (2012) suggested that attitude has significant influence on entrepreneurial behavior. Based on these premises, we postulate that graduates are rational actors whose educational background could influence their technopreneurship intention and behavior. Consequently, we argue that technology readiness (TR) and financial literacy (FL) could help explain graduate technopreneurial intention and behavior.

Despite the importance TR and FL as indicators of entrepreneurial intention and behavior, many graduate are discouraged to venture into TE due to poor TR (Ramasesha, Kingshott, and Stein 2015; Haug, Pedersen, and Arlbjørn 2011) and lack of financial resources (Nkundabanyanga et al. 2014). Challenges of TR includes high costs of technology (Mankins 2009), technology discomfort and insecurity (Parasuraman 2000), system complexities and uncertainties (Austin and York 2015). Similarly, low FL makes potential technopreneurs unable to participate in the formal financial system, identify the best sources of funding technology-based firms and manage financial risks (Central Bank of Nigeria 2015). Thus the need to promote graduate technopreneurship is needed more than ever. This is amidst high level of structural unemployment among Nigerian graduates. Statistics show that each year approximately 1.8 million students graduate from institutions of higher learning in Nigeria and more than 80% of remains unemployed (Chinyere and Faith, 2012, NBS, 2014). Without willingness to accept technological solutions and utilize the formal financial

institutions (Abbasian and Yazdanfar 2013), graduate students cannot start new technology-based firm. If they do, the risk of failure could be colossal.

On top of these challenges, the findings on the scarce studies between TR and entrepreneurial behaviour (Gombachika and Khangamwa,2013; Vaaler and McNamara, 2010), FL and entrepreneurial behaviour (Oseifuah 2010; Nkundabanyanga et al. 2014), as well as entrepreneurial intention and behaviour (Venkatesh et al. 2011; Sophonthummapharn and Tesar 2007; Martins, Oliveira, and Popovič 2014) suggest mixed findings. On top of these inconsistent findings, Gombachika and Khangamwa (2013) found that technology readiness explains 33 per cent of the variations in entrepreneurial attitude and subsequently suggested further research that could explain the remaining 67% of its variance. Thus we argue that the intervening role of TI could help explain the inconsistent findings and the remaining variances. Based on these issues, we employed a four-stage mediation analyses to investigate the mediating role of TI on the relationship between TR and graduate TB as well as FL and graduate TB. These types of intervening effects remain unknown in academic literature.

TE refers to the creation of new firms by independent entrepreneurs and corporations to exploit technological discoveries (Zahra and Hayton 2004). In this study, we defined TE as a "fusion of knowledge and capabilities between management and scientific/engineering professions to operate high-potential and technology-intensive business" (Singhry, 2013). The individual benefits of TE include independence, opportunity recognition, and innovativeness; its micro benefits include competitiveness and firm performance; while it has macro impact on job creation, poverty reduction, and economic growth (Singhry 2015). TR is defined as a "person's propensity to embrace and use new technologies for accomplishing goals in home life and at work" (Parasuraman 2000). It influences organizational entrepreneurial intention and behaviour, learning capabilities, collaborative entrepreneurship, and market performance (Richey and Autry, 2009).

Financial literacy is defined as "[. . .] the combination of consumers'/investors' understanding of financial products and concepts and their ability and confidence to appreciate financial risks and opportunities, to make informed choices, to know where to go for help and to take other effective actions to improve their financial well-being" (OECD 2005). It is also defined as "the possession of knowledge and skills by individuals to manage financial resources effectively in order to enhance their economic well-being" (Central Bank of Nigeria 2015). Benefits of financial literacy include ability to choose from financial products, credit worthiness, and motivation for venture creation. Specifically, financial literacy helps entrepreneurs to access credit, budget, save money, control spending, handle debt, participate in both formal and informal financial markets, create wealth, and attain physical, mental and emotional health (Abubakar 2012).

Graduate entrepreneurship is the "interaction between the graduate as the product of university education and business start-up in terms of an individual's career-orientation and mindset towards self-employment" (Davey, Plewa, and Miemie 2011). In line with Venkatesh, James, and Xu (2012), we conceive TI as effort expectancy, performance expectancy, social influence, facilitating condition, price value, hedonic motivation, and habit. Accordingly intention influences behaviour (Venkatesh et al. 2003). Despite continued interest and research efforts on graduate entrepreneurial intent, the relationships among TR, FL, TI, and TB there is lacking in Nigeria.

2. THEORETICAL FRAMEWORK

In this paper, we employed the theoretical lens of the UTAUT 2 (Venkatesh, James, and Xu 2012) to explain graduate technopreneurial behaviour. According to the theory behaviour toward new technology is influenced by effort expectancy, performance expectancy, social influence, facilitating condition, hedonic motivation, price value, and habit. According to Venkatesh, Morris, Davis, and Davis (2003), effort expectancy is the "degree of ease associated with the use of the system"; performance expectancy is "the degree to which an individual believes that using the system will help him or her to attain gains in job performance"; facilitating condition is the "degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system". According to Venkatesh et al. (2012), social influence is the "degree to which individual perceives that family and friends believe she or he should use a particular technology"; hedonic motivation is the "fun or pleasure derived from using a technology"; habit is the "extent to which people tend to perform behaviors automatically because of learning". Price value is the "consumers' cognitive tradeoff between the perceived benefits of the applications and the monetary cost for using technology" (Dodds, Monroe, and Grewal 1991). All UTAUT 2 constructs have significant influence on behavioral use of technology (Brown, Dennis, and Venkatesh, 2010, Oh and Yoon, 2014, Riffai, Grant, and Edgar, 2012, Wu, Tao, and Yang (2008). However, facilitating condition does not influence usage of technology (Martins, Oliveira, and Popovič 2014). Based on these classifications and definitions, we argue that technological readiness and financial literacy could influence graduates technopreneurship intention and behaviour. Therefore, we develop the research framework in Figure 1.

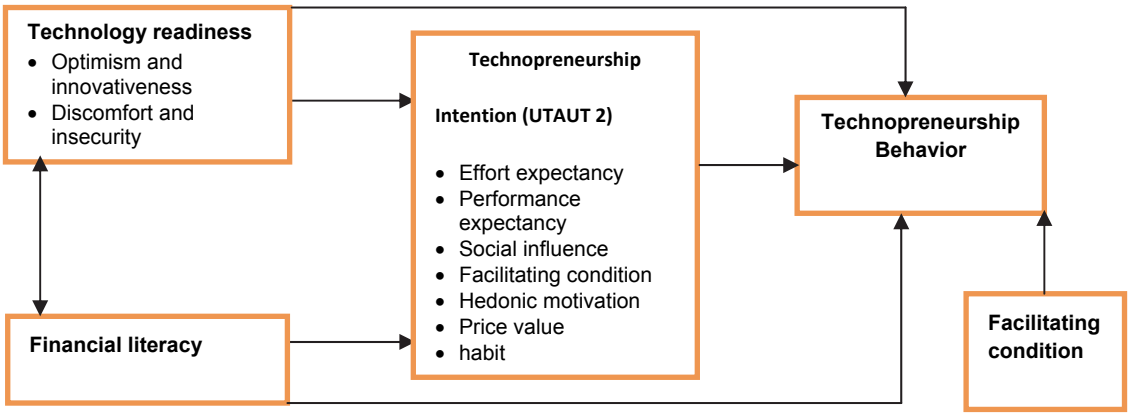

Figure 1: Model of graduate technopreneurial behavior

TR index is classified into mental enablers and inhibitors. The enablers are optimism and innovativeness while discomfort and insecurity are the inhibitors. Optimism is the "positive view of technology and a belief that it offers people increased control, flexibility, and efficiency in their lives" (Parasuraman 2000). Innovativeness is the "tendency to be a technology pioneer and thought leader" (Kuo 2013). Discomfort is the "perceived lack of control over technology and a feeling of being overwhelmed by it" (Richey and Autry 2009). Insecurity is the "distrust of technology and skepticism about the ability of technology to work properly" (Richey and Autry 2009; Kuo 2013; Parasuraman 2000). Positive mental state about new technology activates willingness to accept and use it while negative feeling discourages or delays its acceptance and use.

3. HYPOTHESES DEVELOPMENT

3.1 Technological readiness and technopreneurial intention and behavior

TR is a mental model that affects person's behaviour to use new technologies. Today's customers prefer to be serving through technology-based systems (Parasuraman 2000). As a result, prospective venture owners must be prepared and ready to serve customers through technology-based solutions. Ferreira, da Rocha, and da Silva (2014) found that TR influence consumers' cognitive and affective attitudes toward adoption of new technology. Similarly, Shivers-Blackwell and Charles (2006) found that students' readiness influence attitude toward use of ERP systems and their attitude also influence behaviour to use the systems. Ramasesha, Kingshott, and Stein (2015) and Austin and York (2015) argued for an assessment of graduates' TR and behaviour because it is limited in the literature. While optimism and innovativeness have significant impact on satisfaction and intention to use technology, discomfort and insecurity have negative and insignificant relationship with continuance intention to use technology (Shih-Chih Chen, Chen, and Chen 2009). Although this argument

fits, we are not certain whether TR will influence graduates' technopreneurial intention and behaviour. Therefore, we postulate that:

H1 (a): TR (optimism and innovativeness) has significant influence on TB.
H1 (b): TR (discomfort and insecurity) does not have significant influence on TB.
H1 (c): TR (optimism and innovativeness) has a significant influence on TI.
H1 (a): TR (discomfort and insecurity) does not have significant influence on TI.

3.2 Financial literacy and technopreneurial intention and behaviour

All economic behaviour has financial implications as such entrepreneurs need financial literacy to make economic decisions. Lack of financial literacy and limited access to financial resources discourage the spirit of venture creation (Nkundabanyanga et al. 2014). Graduate students are poor, lack seed capital, and therefore cannot start a functional business. In this regard, financial literacy is important to help them not only identify sources of capitalization but also manage finance for successful business operations. Previous studies showed that financial literacy is positively related to self-beneficial financial behaviour. Jappelli and Padula (2011) suggested that financial literacy is positively correlated with wealth creation. Abreua and Mendes (2010) pointed that education and financial literacy have significant impact on investment behaviour and portfolio diversification. Nkundabanyanga et al. (2014) found that financial literacy has significant influence on access to capital; similarly, commercial bank lending terms correlate with investor's financial literacy. While Al-Tamimi and Kalli (2009) pointed that education influences financial literacy in UAE, they concluded that financial literacy has negative relationship with investment decision. However, Chen and Volpe (2002) suggested that education or experience do not have significant impact on financial literacy. Despite these argument, we concur with Abubakar (2012) who suggested that it is easier to shape the financial literacy of graduate students because of their educational background. Therefore, we hypothesize that:

H2 (a): There is a significant relationship between FL and TB.
H2 (b): There is a significant relationship between FL and TI.

3.3 Technopreneurial intention and behaviour

UTAUT explained about 70% of the variance in intention to use a technology (Venkatesh et al. 2003; Venkatesh, James, and Xu 2012), and about 50% of the variance in behaviour to technology use a technology (Venkatesh, James, and Xu 2012). We are not sure whether these thresholds hold for graduate technopreneurial intention and behaviour. Solesvik, Westhead, Kolvereid, and Matlay (2012) suggest that attitude has significant influence on entrepreneurial behaviour. Price value influences behavioral intention to use a technology

(Venkatesh, James, and Xu 2012). Wu, Tao, and Yang (2008) found that performance expectancy, social influence, and facilitating conditions influence both intention and use behaviour. The study further specified that effort expectancy influence behavioral use but not intention. Oh and Yoon (2014) pointed that users' perceptions positively affect acceptance and use of the technology. Despite the positive relationship between entrepreneurial intention and behaviour, Vinogradov, Kolvereid, and Timoshenko (2013) suggested that entrepreneurial intention does not influence behaviour in a period of full employment. Similarly, Martins et al. (2014) found that facilitating condition has negative and non-significant relationship with behaviour to use of technology. Based on these arguments and the UTAUT 2 constructs, we postulate that:

H3 (a): TI has significant influence on TB.
H3 (b): Facilitating condition has significant relationship with TB.

3.4 Technology readiness, technopreneurial intention, and technopreneurial behaviour

Other than the study by Brown, Dennis, and Venkatesh (2010) who found that UTAUT is the channel through which collaborative technology influences behavioral use of technology, we could not find a mediating relationship of the constructs. Literature shows that Technology Acceptance Model (TAM) has indirect relationship between technology readiness and intention (Chen, Chen, and Chen, 2009). Furthermore, Shih-chih Chen and Li (2010) found that attitude and perceived behavioral control have indirect relationship between technology readiness and continuance intention. However, subjective norm has no indirect relationship. Kuo (2013) found that technology readiness moderates the relationship between information system quality and firm performance. Tsourela and Roumeliotis (2015) found that technology readiness moderates the relationship of performance expectancy, effort expectancy, and social influence on behavioral use. However, it does not moderate the relationship between facilitating conditions and behavioral use. Vize, Coughlan, Kennedy, and Ellis-Chadwick (2013) found significant relationship between technology readiness and customer satisfaction. Lai (2008) found that professional accounting students are moderately ready and resistant on self-efficacy. Technological readiness has significant influence on behavioural intentions, perceived usefulness, ease of use, and attitude towards self-service technology (Lin and Chang 2011). However, the effect of technology readiness on user attitudes toward cell phones is weak (Sophonthummapharn and Tesar 2007). Since previous literature suggested the significant relationship between technology readiness and behavioral, technology readiness and intention, as well as intention and behaviour, we propose that:

H4 (a): TI mediates the relationship between TR (optimism and innovativeness) and TB.
H4 (b): TI mediates the relationship between TR (discomfort and insecurity) and TB.

3.5 Financial literacy, technopreneurial intention, and technopreneurial behaviour

FL is a foundation for venture capitalization and start-up. Potential and existing entrepreneurs must use their financial literacy and take advantages and opportunities in the financial markets (Al-Tamimi and Kalli 2009). With FL, poor graduates could access formal finance and start technology-based firms. Empirical evidence suggests that FL has positive impact on financial behaviour of prospective and existing entrepreneurs (Abubakar 2012). External sources of finance have more influence on firms' competitiveness than internal sources (Fonseka, Tian, and Li 2014). Cole, Simpson, and Zia (2009) and Nkundabanyanga et al. (2014) found that FL influence use of bank services and behaviour and individuals with low FL borrow at higher interest rates. Kimuyu and Omiti (2000) indicated that education increase access to credit. The prevailing literature shows that FL influences TI and TB, while TI also relates with behaviour. However, literature is not clear about the intervening role of TI on FL and TB. Therefore, we hypothesize that:

H5: TI mediates the relationship between FL and TB.

4. METHOD

This study employs quantitative research methodology based on cross-sectional survey. Data was collected from graduates in Bauchi State of Nigeria. Because there is no database of graduates in Bauchi state, the study adopted the convenience sampling method. Targets were randomly asked to determine whether they are graduates before requested to fill a questionnaire. 300 questionnaires were distributed of which 252 were returned and 226 found usable for analysis. The questionnaire are self-administered (face-to-face) with the help of 2 research assistants. The research assistants have experience in administering questionnaires. The sample size was computed from the table of sample size determination for indefinite population as suggested by Krejcie and Morgan (1970). The response rate was 84% and greater than 76% (Sudman, Greeley, and Pjnto 1965). Table 1 shows that the sample consists of 159 (70.4%) males and 67 females (29.6%). Other characteristics of the sample are age, qualification, employment status and number of years in employment of respondents. Self-administered questionnaire is more effective though costly than mail and telephone surveys (Szolnoki and Hoffmann 2013).

5. MEASUREMENT

The research instruments in this study have been validated in previous literature. They were directly adapted in some while adopted and modified in others to suit the context of this study. All items have been measured on 7 point Likert-type scale from 1 = strongly disagree to 7 = strongly agree. Measurement for technology readiness was extracted from Parasuraman (2000). Measurement for UTAUT 2 comprising of technopreneurship intention and behaviour was adopted and modified from Venkatesh et al. (2012). Measurement for financial literacy was adopted and modified from Atkinson et al. (2007) and Chen (2011).

6. COMMON METHOD BIAS

Common method bias is a major issue in quantitative studies. It occurs when data is collected based on self-report from single respondents. It is a source of both measurement and systematic errors. When common method bias occurs, correlation estimates among constructs are inflated to the extent that the results give spurious relationship (Podsakoff and Oran, 1986). In this study, we identify potential sources of common method biases and provide both procedural and statistical remedies as suggested by Podsakoff, MacKenzie, Lee, and Podsakoff (2003). On the procedural remedies we selected the exogenous and endogenous constructs from different sources. Secondly, the instruments are modified for clarity, simplicity, and comprehension. Third, we resolved the issues of consistency and social desirability by pledging the anonymity of the respondents. The issue of consistency motif was resolved by collecting data from respondents once and thus avoided issues associated with replication of data collection. Similarly, we hide the identity of the researchers to reduce leniency biases. Lastly, a statistical remedy of common method biases was assessed using Harman's one-factor test (Podsakoff et al., 2003). Harman's single factor test was employed because we could not measure the study's constructs in different contexts. We loaded technological readiness (19 items), UTAUT dimensions (24 items), financial literacy (5 items), and technopreneurship behaviour (5 items) in an exploratory factor analysis. Analysis showed 11 factors with eigenvalues > 1.0, and total variance explained of 69.50%. The first factor explained 34.21% of the variance which is < 50% of the total variance explained (Podsakoff et al., 2003). Based on the procedural and statistical remedies we applied, we concluded that the effect of common method bias is not substantial and could be tolerated.

7. RESULT

Results of this paper comprise of respondent profiles, exploratory factor analysis (EFA), the confirmatory factor analysis (CFA), and the structural model. The respondent profile is presented in Table 1.

Table 1. Respondent profile

Profile	Variable	Frequency	Per cent
Gender	Male	159	70.4
	Female	67	29.6
	Total	**226**	**100.0**
Age	18-25	20	8.8
	26-30	55	24.3
	31-40	84	37.2
	41-50	54	23.9
	Over 50	13	5.8
	Total	**226**	**100.0**
Qualification	PhD	7	3.1
	Masters	46	20.4
	Degree HND	153	67.7
	Others	19	8.4
	Missing	1	.4
	Total	**226**	**100.0**
Employment status	Government Institution	134	59.3
	Private institution	41	18.1
	Self-employed	39	17.3
	Non-government organization	8	3.5
	others please specify	4	1.8
	Total	**226**	**100.0**
Specialization/ discipline	Management sciences	107	47.3
	Arts and humanities	49	21.7
	Engineering and technology	52	23.0
	Agricultural sciences	13	5.8
	Education	5	2.2
	Total	**226**	**100.0**

7.1 Exploratory factor analysis (EFA)

56 items were initially designed to measure the model. Exploratory factor analysis (EFA) using principal component method of extraction, Eigenvalue > 1, and the Varimax factor rotation produced 12 dimensions and 50 items. 6 items were dropped due to factor loading below .5. These items were TO1 - 'learning

about technology is rewarding to me; TI5 – 'I have fewer problems than other people in making technology work for me'; TD1 – 'sometimes I think that technology systems are not designed for use by ordinary people'; PE1 – 'I find the use of modern technology useful in my daily life'. Also dropped are FL1 -'I find it more satisfying to spend money than save and plan for business tomorrow', and FL2 – 'I prefer to buy things on credit than pay outright cash'.

7.2 Confirmatory factor analysis (CFA)

Confirmatory factor analysis (CFA) was performed to assess the construct, convergent and discriminant validity of this study. After some iterations to purify the measurement models, all the 3 items measuring hedonic motivation were dropped due to measurement errors above 15 (Awang 2014). These items were HM1 - 'using modern technology is fun'; HM2 – 'using modern technology is enjoyable'; and HM3 – 'using modern technology is very entertaining'. Overall, 47 refined items qualified to measure the regression weights of our theoretical framework/model. Table 2 shows that the 5 measurement models fit our analyses.

Table 2: Model fit summary of exogenous and endogenous constructs

Variable	No. of items/ dimensions	Validity (CFA)
Technology readiness: Facilitators	8/2	RMR = .149, GFI = 0.970, AGFI = 0.944, CFI = 0.991, TLI = 0.987, NFI = 0.970, RMSEA = 0.042, PCLOSE = 0.559, ChiSq/df = 1.404, P-Value = 0.112
Technology readiness: Inhibitors	5/2	RMR = .070, GFI = 0.987, AGFI = 0.960, CFI = 0.991, TLI = 0.977, NFI = 0.977, RMSEA = 0.052, PCLOSE = 0.397, ChiSq/df = 1.617, P-Value = 0.167
Financial literacy	4/1	RMR = .009, GFI = 0.998, AGFI = 0.978, CFI = 0.999, TLI = 0.997, NFI = 0.998, RMSEA = 0.030, PCLOSE = 0.416, ChiSq/df = 1.256, P-Value = 0.262
Technopreneurship intention	11/4	RMR = .044, GFI = 0.965, AGFI = 0.910, CFI = 0.937, TLI = 0.879, NFI = 0.916, RMSEA = 0.094, PCLOSE = 0.013, ChiSq/df = 3.497, P-Value = 0.000
Technopreneurship behaviour	5/1	RMR = .036, GFI = 0.985, AGFI = 0.965, CFI = 0.997, TLI = 0.995, NFI = 0.979, RMSEA = 0.023, PCLOSE = 0.839, ChiSq/df = 1.155, P-Value = 0.299

The literature shows that Root mean residual (RMR) should be smaller and preferably < 1; Goodness of fit index (GFI) >.95 (Jöreskog and Sörbom 1989);

adjusted Goodness of fit index (AGFI) > .95 (Tabachnick and Fidell 2001); comparative fit index > .95 (Hu and Bentler 1999); Tucker-Lewis index (TLI) >.95 (Jöreskog and Sörbom, 1993; Schermelleh-Engel, Moosbrugger and Müller, 2003); normed fit index (NFI) > .95 (Bentler and Bonett 1980); root mean square error of approximation (RMSEA) <.6 (Hu and Bentler 1999); probability of close fit (PCLOSE) >.5 (Browne and Cudeck 1993); and P-value <.005 (Jöreskog 1967).

7.3 Normality test, reliability, factor loading, and descriptive statistics

Furthermore, normality tests were performed on the measurement models as a precondition for regression analysis. The univariate and multivariate normality were measure using by Mardia's test of normality (Ghasemi and Zahediasl, 2012). Table 3 shows that skewness ranges between -0.12 and .02 and kurtosis ranges between -.02 and .25. Thus, it could be suggested that all the measurement items are within the normality (skewness) and kurtosis thresholds of -1.00 and +1.00 (Field 2009). Furthermore, the table shows that factor loading of all items ranges between .52 and .92. The Cronbach's alpha ranges between .66 and .90. All are above the 0.5 threshold and therefore satisfied the requirement for reliability (Nunnally, 1978).

Table 3: Descriptive statistics, factor loading, reliability, and normality test

		Mean	Std. dev.	Reliability	Factor loading	Skewness	Kurtosis
Technological optimism		**20.74**	**6.04**	**.90**			
	TO1	5.02	1.79	.87	.81	-.67	-.69
	TO2	5.10	1.74	.87	.81	-.81	-.53
	TO3	5.23	1.74	.85	.86	-.87	-.37
	TO4	5.38	1.64	.87	.83	-1.04	-.10
Technological innovativeness		**17.24**	**5.53**	**.79**			
	TI1	4.42	1.66	.74	.72	-.32	-.89
	TI2	4.30	1.74	.71	.76	-.15	-1.11
	TI3	4.06	1.87	.72	.72	.15	-1.18
	TI4	4.47	1.77	.79	.62	-.24	-1.18
Technological discomfort		**17.73**	**4.84**	**.66**			
	TD2	4.06	1.68	.62	.83	-.12	-1.00
	TD3	4.71	1.78	.58	.75	-.36	-1.07
	TD4	4.51	1.80	.56	.72	-.37	-.97
	TD5	4.45	1.61	.62	.52	-.24	-.75
Technological insecurity		**18.70**	**5.21**	**.77**			
	TS1	5.10	1.73	.75	.66	-.68	-.67
	TS2	4.55	1.68	.73	.87	-.22	-1.06

	TS3	4.51	1.71	.66	.77	-.31	-.94
	TS4	4.54	1.66	.71	.66	-.42	-.77
Effort expectancy		**14.21**	**3.77**	**.83**			
	EE1	5.17	1.54	.74	.60	-.79	-.32
	EE2	5.26	1.37	.74	.77	-.93	-.37
	EE3	5.27	1.44	.82	.79	-.84	-.06
Performance expectancy		**16.23**	**4.04**	**.90**			
	PE2	5.60	1.51.	.87	.84	-1.12	.22
	PE3	5.65	1.48	.82	.91	-1.11	.25
	PE4	5.65	1.43	.88	.85	-1.05	.25
Social influence		**15.38**	**3.60**	**.84**			
	SI1	5.14	1.41	.80	.77	-.59	-.48
	SI2	5.09	1.35	.75	.79	-.74	-.12
	SI3	5.15	1.39	.77	.82	-.62	-.37
Facilitating condition		**19.96**	**4.87**	**.80**			
	FC1	4.71	1.68	.75	.71	-.47	-.74
	FC2	5.11	1.48	.71	.82	-.86	-.02
	FC3	4.90	1.52	.75	.70	-.55	-.62
	FC4	5.24	1.44	.80	.64	-.74	-.19
Price value		**18.88**	**5.49**	**.84**			
	PV1	4.61	1.69	.80	.71	-.42	-.81
	PV2	4.88	1.53	.80	.80	-.48	-.74
	PV3	4.73	1.62	.78	.69	-.54	-.65
	PV4	4.66	1.80	.65	.80	-.44	-1.01
Habit		**14.40**	**4.49**	**.85**			
	HA1	4.94	1.69	.82	.92	-.72	-.40
	HA2	4.74	1.69	.68	.82	-.50	-.52
	HA3	4.72	1.74	.86	.82	-.48	-.68
Financial literacy		**24.54**	**5.79**	**.84**			
	FL3	5.06	1.48	.81	.76	-.60	-.42
	FL4	5.12	1.44	.82	.76	-.66	-.34
	FL5	5.00	1.40	.81	.71	-.68	-.10
	FL6	4.69	1.51	.79	.70	-.52	-.37
	FL7	4.68	1.54	.84	.58	-.39	-.58
Technopreneurship behaviour		**26.39**	**6.32**	**.90**			
	TB1	5.32	1.56	.88	.81	-.81	-.38
	TB2	5.14	1.48	.86	.82	-.81	-.09
	TB3	5.15	1.74	.87	.76	-.80	-.05
	TB4	5.11	1.49	.87	.81	-.79	-.14
	TB5	5.67	1.53	.89	.75	-1.11	-.30

Correlations

Correlations among technology optimism, technology innovativeness, technology discomfort, technology insecurity, effort expectancy, performance expectancy, social influence, habit, price value, facilitating condition, financial literacy, and technopreneurial behaviour are shown in Table 4. The correlation coefficients indicate that the all constructs are significant at the .01 level (2-tailed). The

strongest correlation is .75 and is between effort expectancy and performance expectancy while the lowest is between .19 and is between technology discomfort and price value. There was no correlation above .85 and therefore multicollinearity was not an issue.

7.4 Construct Convergent and discriminant validity

Construct validity was assess through the Pearson correlation coefficients (Farag et al., 2012; Rod et al., 2013). All the 12 dimensions have bivariate correlation between .19 and .75 (see Table 4). Convergent validity was evaluated based on recommendations by Fornell and Larcker (1981) and Hair Jr, et al. (2013). First, item loading on dimensions are > .80 and significance. Second, composite reliability of the dimensions are > .80. Third, the average variance extracted (AVE) of all dimensions are > .50. Therefore, evidence of convergent validity exist (Anderson and Gerbing, 1988). Discriminant validity was assessed based on the criterion recommended by Fornell and Larcker (1981). The criterion states that "the square root of AVE for each construct must be greater than its correlations with all other constructs". In other words, "AVE must exceed the squared correlation with any other construct" (Hair Jr et al., 2013). The bold values represented on diagonal in Table 4 shows that the square root of AVE for each construct is greater than its correlation with all other constructs (Fornell and Larcker 1981). Furthermore, values above the bold diagonal are the squared correlation of all constructs and are smaller than AVE (Hair Jr et al., 2013). The values in Table 4 indicate that each construct is empirically and statistically different from other constructs in the study (Chin, 1988). Therefore, evidence of discriminant validity and unidimensionality exist in this study.

Table 4: Correlation, Construct, and Convergent and discriminant validity

Variable	TEO	TEI	TED	TES	EFE	PEE	SOI	HAB	PRV	FAC	FLT	TEB	CR	AVE
TEO	**.91**	.23	.11	.04	.27	.41	.23	.12	.06	.19	.19	.26	.90	.83
TEI	.48**	**.84**	.18	.08	.23	.18	.14	.24	.07	.20	.20	.21	.80	.71
TED	.33**	.42**	**.84**	.27	.10	.10	.08	.11	.17	.13	.12	.10	.80	.71
TES	.21**	.29**	.52**	**.85**	.06	.12	.13	.10	.11	.17	.10	.13	.81	.73
EFE	.52**	.48**	.31**	.24**	**.89**	.56	.28	.24	.15	.40	.27	.40	.83	.79
PEE	.64**	.42**	.31**	.34**	.75**	**.93**	.41	.23	.23	.44	.37	.49	.90	.87
SOI	.48**	.37**	.28**	.36**	.53**	.64**	**.89**	.19	.31	.30	.34	.36	.84	.79
HAB	.34**	.49**	.33**	.31**	.49**	48**	.43**	**.92**	.16	.32	.29	.25	.89	.85
PRV	.25**	.27**	.19**	.33**	.39**	.48**	.56**	.40**	**.87**	.30	.15	.12	.84	.75
FAC	.44**	.45**	.36**	.41**	.63**	.66**	.55**	.56**	.55**	**.84**	.41	.37	.81	.72
FLT	.43**	.45**	.34**	.32**	.52**	.61**	.58**	.54**	.39**	.64**	**.84**	.41	.83	.70
TEB	.51**	.46**	.32**	.36**	.63**	.70**	.60**	.50**	.35**	.61**	.64**	**.89**	.89	.79

TEO = technology optimism, TEI = technology innovativeness, TED = technology discomfort, TES = technology insecurity, EFE = effort expectancy, PEE = performance expectancy, SOI = social influence, HAB = habit, PRV = price value, FAC = facilitating condition, FLT = financial literacy, TEB= technopreneurship behaviour

1. **. Correlation coefficient is significant at the 0.01 level (2-tailed).
2. Bold diagonal values are the squared root of average variance extracted (AVE)
3. Values above the diagonal are the squared correlation of variables.

Structural model

The structuralization was perform based on Baron and Kenny (1986) four-stage hypotheses of mediation effect. However, the mediation analyses was beyond baron and Kenny (Hayes 2009). First, we assessed the direct relationship between the exogenous constructs and endogenous construct (X→Y). The relationship between FL and TB is significant (r =.43, β = .47, *P* < .000). Similarly, the influence of TR (optimism and innovativeness) and TB is positive and significant (r =.52, β = .64, *P* < .005). However, the relationship between TR (discomfort and insecurity) and TB is not significant (r =.10, β = .13, *P* > .005). Therefore we did not test mediation on TR (discomfort and insecurity), TI, and TB because it fails the first mediation condition. Figure 2 provides the validated structural model of the direct relationship. The result is summarized in the Table 5.

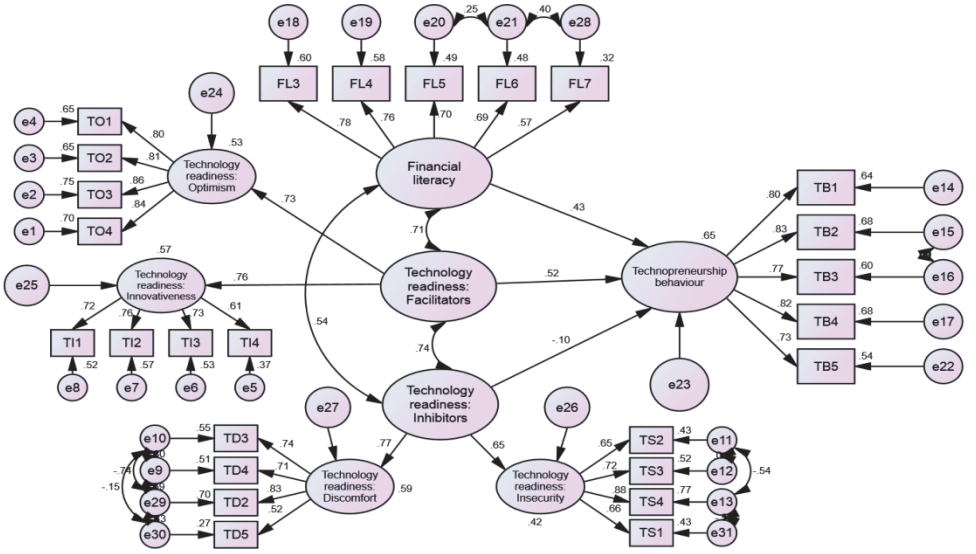

Figure 2: Structural model of direct relationship

The introduction of TI (UTAUT 2) as a mediator into the model changes these direct findings. This is presented in Figure 3.

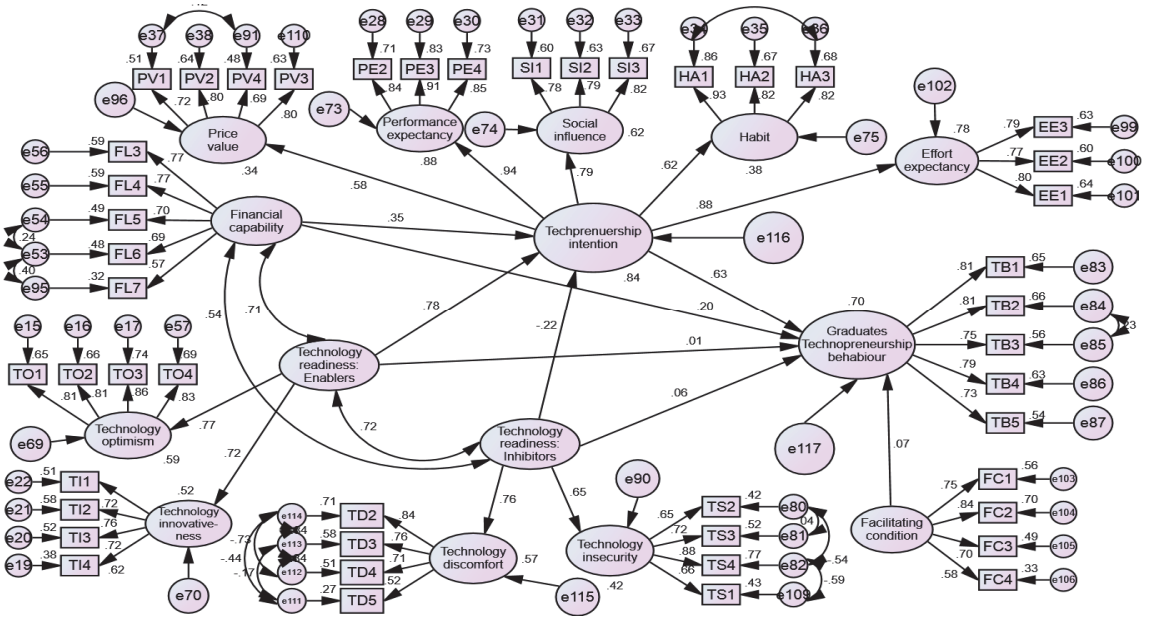

Figure 3: The structural model

Table 5: Result of standardized and unstandardized regression estimate of the model

Mediation stages and figures	Relationship	Std. Beta	Actual Beta	S.E.	C.R.	P	Remarks
Stage 1 X→Y (Figure 2**)**	Technology readiness (optimism and innovativeness) and TB	.52	.64	.26	2.47	.013	Supported
	Technology readiness (discomfort and insecurity) and TB	-.10	-.13	.18	-.70	.483	Not supported
	Financial literacy and technopreneurial behaviour	.43	.47	.13	3.52	***	Supported
Stage 2 X→M (Figure 3)	Technology readiness (optimism and innovativeness) and TI	.78	1.26	.39	3.23	.001	Not supported
	Technology readiness (discomfort and insecurity) and TI	-.22	-.40	.27	-1.46	.143	Supported
	Financial literacy and technopreneurial intention	.35	.43	.16	2.76	.006	Not supported

	Facilitating condition and technopreneurship behaviour	.07	.07	.50	1.36	.174	Supported
Stage 3 M→Y (Figure 3)	Technopreneurial intention and technopreneurship behaviour	.63	.60	.24	2.54	.011	Supported
Stage 4 (Figure 3)	Technology readiness (optimism and innovativeness) and TB	.10	.02	.45	.03	.973	Not supported
	Technology readiness (discomfort and insecurity) and TB	.06	.10	.24	.43	.666	Not supported
	Financial literacy and technopreneurial behaviour	.20	.23	.13	1.78	.075	Not supported
Figure 2	Coefficient of determination (CD) of TB	.65					
Figure 3	CD of technopreneurial intention	.84					
Figure 2 (CD)	CD of technopreneurial behaviour	.70					
	*NS = not significant and not supported						

Test of the mediating effects of technopreneurial intention (UTAUT 2 dimensions)

Data from Figure 3 and Table 5 were used to compute the mediation effects in table 6, 7. And 8.

Table 6: Technology readiness (optimism and innovativeness) and technopreneurship behavior in the presence of technopreneurship intention (UTAUT 2 dimension)

Hypothesis statement of path analysis H4 (a)	**Path estimate**	**Actual estimate**	**P-Value**	**Results**
TR (optimism and innovativeness) and TI	.78	1.26	.001	Significant
Technopreneurship intention and TB	.63	.60	.011	Significant
TR (optimism and innovativeness) and TB	.10	.02	.773	Not significant

1. The indirect path effect (TR→TI and TI→TB) = .78 x .63 = 0.49
2. The direct path (TR→TB) = .10
3. Both indirect paths (standardized path estimate) of TR→TI and TI→TB

are positive and significant
4. Since the product of indirect effects (.78 x .60 = .49) is greater than direct path (TR→TB) = .10, mediation occurs
5. The type of mediation is full since the direct effect (TR→TB) is no longer significant ($P > 0.05$) when TI enters Figure 3.

Table 7: Technology readiness (discomfort and insecurity) and technopreneurship behavior in the presence of technopreneurship intention (UTAUT 2 dimension)

Hypothesis statement of path analysis H4 (b)	**Path estimate**	**Actual estimate**	**P-Value**	**Results**
TR (discomfort and insecurity) and TI	.-.22	-.40	.143	Not supported
Technopreneurship intention and TB	.63	.60	.011	Supported
TR (discomfort and insecurity) and TB	.06	.10	.666	Not supported

1. The indirect path effect (TR→TI and TI→TB) = -.22 x .63 = -.14
2. The direct path (TR→TB) = .06
3. One of the indirect paths (standardized path estimate) of TR→TI is negative and non-significant
4. Therefore, TI does not mediates the relationship between TR (discomfort and insecurity) and TB

Table 7: Technology readiness (discomfort and insecurity) and technopreneurship behavior in the presence of technopreneurship intention (UTAUT 2 dimension)

Hypothesis statement of path analysis H2	**Path estimate**	**Actual estimate**	**P-Value**	**Results**
Financial literacy and TI	.35	.43	.006	Supported
Technopreneurship intention and TB	.63	.60	.011	Supported
Financial literacy and TB	.20	.23	.075	Not supported

1. The indirect path effect (FL→TI and TI→TB) = .35 x .63 = 0.22
2. The direct path (TR→TB) = .20
3. Both indirect paths (standardized path estimate) of FL→TI and TI→TB are positive and significant
4. Since the product of indirect effects (.35 x .63 = .22) is greater than direct path (FL→TB) = .20, mediation occurs
5. The type of mediation is full since the direct effect (FL→TB) is no longer significant ($P > 0.05$) when TI enters Figure 3

8. DISCUSSION OF FINDINGS

The finding on H1 (a) shows that TR (optimism and innovativeness) has significant relationship with TB (β = .52, r =.64, P < .005). The finding indicates that the higher the optimism and innovativeness, the more ready to start technology-based firms. Statistically, it shows that when optimism and innovativeness go up by 1 standard deviation, TB goes up by .52 standard deviations. In other word, when optimism and innovativeness go up by 1, TB goes up by .64. The regression weight for technology readiness (optimism and innovativeness) in the prediction of TB is significantly different from zero at the .005 level (two-tailed). This finding is similar to Chen, Chen, and Chen (2009) who suggested that optimism and innovativeness have significant impact on satisfaction and intention to use technology. Similarly, Shivers-Blackwell and Charles (2006) found that students' TR influence attitude toward use of ERP systems and attitude also influences behaviour to use ERP systems.

The test of H1 (b) suggests that TR (discomfort and insecurity) has a negative and insignificant relationship with TB (β = -.10, r = -.13, P > .005). Thus, the higher the feelings of technology discomfort and insecurity among graduates, the lower are their behaviour to start a technology-based firm. Statistically, it means that when technological discomfort and insecurity goes up by 1 standard deviation, TB goes down by -.10 standard deviation. Once technology discomfort and insecurity goes up by 1, TB goes down by -.13. The regression weight for technology discomfort and insecurity in the prediction of TB is not significantly different from zero at the .005 level (two-tailed). This finding is consistent with Chen, Chen, and Chen (2009) who found that discomfort and insecurity have negative and insignificant relationship with behaviour to adopt technology.

The test of H1 (c) demonstrates that TR (optimism and innovativeness) has significant relationship with TI (β = 1.26, r =.78, P < .005). This indicates that when technology optimism and innovativeness goes up by 1 standard deviation, TI goes up with a standard deviation of .78. When optimism and innovativeness goes up by 1, TI goes up by 1.26. The regression weight estimates for technology optimism and innovativeness in the prediction of TI is significantly different from zero at the .005 level (two-tailed). This finding is consistent with Ferreira, da Rocha, and da Silva (2014) who found that TR influence consumers' cognitive and affective attitudes toward adoption of new technology.

The test of H1 (d) suggest that technology readiness (discomfort and insecurity) has an insignificant relationship with TI (β = -.40, r = -.22, P > .005). Thus, the higher the feelings of technology discomfort and insecurity among graduates, the lower is the intention to start a technology-based firm. Statistically, it means that when technological discomfort and insecurity goes up by 1 standard deviation, TI goes down by -.22 standard deviation. When technological

discomfort and insecurity goes up by 1, TI goes down by -.40. The regression weight for technology discomfort and insecurity in the prediction of TI is not significantly different from zero at the .005 level (two-tailed).

The test of H2 (a) suggest a significant relationship between FL and TB (β = .43, r =.47, P < .000). The finding indicates that the higher the financial literacy of graduate student, the more tendency to create new technology-based firm. Statistically, it means that when FL goes up by 1 standard deviation, TB goes up .43. When FL goes up by 1, TB goes up by .47. The regression weight estimate of FL in the prediction of TB is significantly different from zero at the .001 level (two-tailed). This finding concurs with Abreua and Mendes (2010) who found that FL has a significant relationship with investment behaviour and portfolio diversification. Additionally, Abubakar (2012) suggests that FL has a positive impact on the financial behaviour of individuals and entrepreneurs.

The test of H2 (b) found a significant relationship between FL and TI (β = .35, r =.43, P < .005). This shows when FL goes up by 1 standard deviation, TI goes up by .35 standard deviations. When FL goes up by 1, TI goes up by .43. The regression weight for financial literacy in the prediction of technopreneurship behaviour is significantly different from zero at the .005 level (two-tailed). This finding is consistent with Kimuyu and Omiti (2000) who indicate that education increase access to credit. Similarly, Cole, Simpson, and Zia (2009) found that FL influences the use of bank services and behaviour.

The test of H3 point out that TI has positive and significant influence on TB (β = .63, r =.60, P < .005). It means that the higher the attitudes toward TE, the higher would be the TB. Statistically, it means that when TI goes up by 1 standard deviation, TB goes up by .63 standard deviations. When TI goes up by 1, TB goes up by .60. The regression weight for TI in the prediction of TB is significantly different from zero at the .005 level (two-tailed). This finding is consistent with Oh and Yoon (2014) who point that users' perceptions positively affect acceptance and use of the technology. On H3 (b), we found a non-significant relationship between facilitating condition and technopreneurial condition (β = .07, r =.07, P > .005). this finding is similar to Martins et al. (2014) who found that facilitating condition has negative and non-significant relationship with behaviour to use of technology. This finding is expected considering the fact that facilitating conditions are external environmental forces outside the behavioural control system of graduates.
The test of H4 (a) yielded positive result. It shows that TI is a full mediator on the relationship between TR (optimism and innovativeness) and TB [(β for X→M = .78; M→Y = .63; and X→Y = .10)]. However, the test of H4 (b) indicates that TI does not mediate the relationship between TR (discomfort and insecurity) and TB [(β for X→M = -.22; M→Y =.63; and X→Y = .06)]. The test of H5 found that TI is a full mediator on the relationship between FL and TB [(β for X→M = .35; M→Y = .63; and X→Y = .20)]. To the best of our

knowledge, these mediation analyses are novel findings and major contributions of this paper. The finding on H4 shows that TI consisting of effort expectancy, performance expectancy, social influence, price value, and habit is the mechanism through which TR (optimism and innovativeness) could influence graduate TB.

Nevertheless, the test of H4 (B) shows that even if graduates student can control their effort expectancy, performance expectancy, social influence, price value, and habit, their TB would not improve as long as there is feeling of discomfort and insecurity regarding technopreneurship. Furthermore, the finding of H5 indicates that FL ought to influence TI (effort expectancy, performance expectancy, facilitating condition, social influence, price value, and habit) in order to have positive impact on graduate TB. Our empirical findings shows that TR and FL explain 84% of the variance in TI. Furthermore, TR, FL, and TI explain 70% of the variance in TB. This finding is consistent but more superior to Venkatesh et al. (2012) who found that UTAUT 2 explained 70% of the variance in intention to use a technology and 50% of the variance in the behaviour to use technology. It is also greater to Gombachika and Khangamwa (2013) who suggest that technology readiness influence only 33% of attitude towards use of ICT.

9. CONCLUSION AND RECOMMENDATION FOR FURTHER STUDIES

The paper is the first to investigate the mediating effect of TI on the relationship between TR and graduate TB. Similarly it is the first to examine the mediating effect of TI on the relationship between FL and graduate TB through the Unified Theory of Acceptance and Use Technology 2 (UTAUT 2). We developed a theoretical model with TR and FL as lower order constructs, which exert influence on graduate TB through TI (UTAUT 2 dimensions). The findings have both theoretical and practical implications.

Theoretically, the intervening role of TI could help to explain the mixed and inconsistent direct findings in previous studies. The introduction of TI into Figure 2 alters the direct relationships in Figure 1, and therefore caused 2 full mediation effects. The mediation effect indicates that higher graduate TB depends on effort expectancy, performance expectancy, facilitating condition, social influence, price value, and habit. The paper is also the first to integrate TR, FL, and UTAUT 2 to explain graduate TB. Thus, we are able to show how TR, FL, and UTAUT 2 could be integrated to promote technology entrepreneurship and entrepreneurial development.

Practically, the paper has implications for graduate students, institutions of higher learning, formal financial institutions, and policy makers regarding

technopreneurial development. The paper shows how graduates could utilize their technological and financial skills to create technology-based firms. Not only will graduates be self-employed but also job creators. Institutions of higher learning should tailor their teaching to encourage graduate toward self-employment in technology-based firms. The study also poses a challenge for financial institutions in Nigeria. Although business plan, character and education should be foremost considerations in given out entrepreneurial loan, most Nigeria's financial institutions emphasize collaterals. Graduate students however, lack collateral. Policy makers could benefits from the findings of this paper by designing programmes and policy that encourage technopreneurial development. Policy and programmes should be developed to counter the effect of technology discomfort and insecurity among potential graduate technopreneurs. Furthermore, policy makers should provide favourable facilitating conditions for the success of technology entrepreneurship. Specific to Nigeria, this paper could help reduce unemployment rates, poverty, the boko-haram insurgency and terrorism, the militancy in the south-south, tribal and religious crises, oil bunkering and stealing, cyber-crimes, desperate journeys to Europe and the U.S.A. Overall, technopreneurial development would have individual, micro, and macro impacts.

Despite the findings of the study, it was not without limitations. First, convenient sampling was used due to lack of graduate database in Nigeria. Thus, we recommend the application of probability sampling when a sampling frame is available. Second, future studies should examine the effect of entrepreneurial competences, entrepreneurial orientation, and personality on the performance of technology-based venture. Third, there is need to examine the model by controlling for age, gender, study discipline, and employment status. Lastly, a case-based approach would provide in-depth insights. Finally, the current findings should be interpreted with cautions and within the cultural context of Nigerian entrepreneurial environment. This is because data came from Nigerian graduates in a technologically and financially disadvantage economy.

REFERENCES

Abbasian, Saeid, & Darush Yazdanfar. (2013). "Exploring the Financing Gap between Native Born Women- and Immigrant Women-Owned Firms at the Start-up Stage." *International Journal of Gender and Entrepreneurship* 5 (2): 157–73. doi:10.1108/17566261311328837.

Abreua, Margarida, & Victor Mendes. (2010). "Financial Literacy and Portfolio Diversification." Quantitative Finance 10(5): 515–28. doi:10.1080/14697680902878105.

Abubakar, Habib Auwal. (2012). ""Entrepreneurship Development and Financial Literacy in Africa." *Journal of Entrepreneurship, Management and Sustainable Development,* 11(4): 281–94.

Al-Tamimi, Hussein a. Hassan, & Al Anood Bin Kalli. (2009). "Financial Literacy and Investment Decisions of UAE Investors*." The Journal of Risk Finance*, 10(5): 500–516. doi:10.1108/15265940911001402.

Anderson, James C., & David W. Gerbing. (1988). "Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach." Psychological Bulletin,.

Atkinson, Adele, Stephen Mckay, Sharon Collard, Elaine Kempson, Adele Atkinson, Stephen Mckay, & Sharon Collard. (2007). "Levels of Financial Capability in the UK Levels of Financial Capability in the UK." Public Money & Management 27(1): 29–36.

Austin, Marc F., & Donald M. York. (2015). "System Readiness Assessment (SRA) an Illustrative Example." Procedia Computer Science 44. Elsevier Masson SAS: 486–96. doi:10.1016/j.procs.2015.03.031. http://www.sciencedirect.com/science/article/pii/S1877050915002677.

Awang, Z. (2014). A Handbook on SEM for Academicians and Practitioners: Step by Step Practical Guides for the Begineers. Vol.2 Firs. Perpustakan Negara Malaysia: MPSW Rich Resources.

Baron, Reuben M, & David A Kenny. (1986). "The Moderator-Mediator Variable Distinction in Social Psychological Research : Conceptual , Strategic, and Statistical Considerations." *Journal of Personality and Social Psychology,* 51(6): 1173–82.

Bentler, P M, & D G Bonett. (1980). "Significance Tests and Goodness of Fit in the Analysis of Covariance Structures." Psychological Bulletin, 88(3): 588.

Brown, Susan a., Alan R. Dennis, & Viswanath Venkatesh. (2010). "Predicting Collaboration Technology Use: Integrating Technology Adoption and Collaboration Research." *Journal of Management Information Systems,* 27(2): 9–54. doi:10.2753/MIS0742-1222270201.

Browne, M W, & R Cudeck. (1993). "Alternative Ways of Assessing Model Fit." Sage Focus Editions 154: 136–136.

Central Bank of Nigeria. (2015). "Financial Literacy." http://www.cbn.gov.ng/Devfin/finliteracy.asp.

Chen, Haiyang, & Ronald P Volpe. (2002). "Gender Differences in Personal Financial Literacy among College Students." Financial Services Review.

Chen, Shih-Chih, Huei-Huang Chen, & Mei-Fang Chen. (2009). "Determinants of Satisfaction and Continuance Intention towards Self-service Technologies." Industrial Management & Data Systems 109 (9): 1248–63. doi:10.1108/02635570911002306. http://www.emeraldinsight.com/doi/abs/10.1108/02635570911002306.

Chen, Shih-chih, & Shing-han Li. (2010). "Consumer Adoption of E-Service : Integrating Technology Readiness with the Theory of Planned Behavior." *African Journal of Business Management,* 4(16): 3556–63.

Chen, Yun. (2011). "The Impact of Strong Ties on Entrepreneurial Intention An Empirical Study Based on the Mediating Role of Self-Efficacy."

Journal of Chinese Entrepreneurship, 3(2): 147–58. doi:10.1108/17561391111144573.

Chin, W.W. (1988). Commentary: Issues and Opinion on Structural Equation Modeling. JSTOR.

Chinyere, T, & C Faith. (2012). "Entrepreneurship and Employability Among Nigerian Graduates." *Mediterranean Journal of Social Sciences*, 3 (December): 68–74. doi:10.5901/mjss.2012.v3n16p68.

Cole, S, T Simpson, & B Zia. (2009). "Prices of Knowledge. What Drives the Demand for Financial Services in Emerging Markets?" Working Papers No. 09-117. Boston.

Davey, Todd, Carolin Plewa, & Struwig Miemie. (2011). "Entrepreneurship Perceptions and Career Intentions of International Students." Education + Training 53(5): 335–52. doi:10.1108/00400911111147677.

Dodds, W. B, K. B Monroe, & D. Grewal. (1991). "Effects of Price, Brand, and Store Information on Buyers." *Journal of Marketing Research*, 28(3): 307–19.

Farag, I, C Sherrington, S.J Kamper, M Ferreira, A.M Moseley, S.R Lord, & I.D. Cameron. (2012). "Measures of Physical Functioning after Hip Fracture: Construct Validity and Responsiveness of Performance-Based and Self-Reported Measures."

Ferreira, Jorge Brantes, Angela da Rocha, & Jorge Ferreira da Silva. (2014). "Impacts of Technology Readiness on Emotions and Cognition in Brazil." *Journal of Business Research*, 67(5). Elsevier Inc.: 865–73. doi:10.1016/j.jbusres.2013.07.005.http://dx.doi.org/10.1016/j.jbusres.2013.07.005.

Field, A. (2009). Discovering Statistics Using SPSS. Sage publications.

Fonseka, M.M., Gao-liang Tian, & Liu-chuang Li. (2014). "Impact of Financial Capability on Firms' Competitiveness and Sustainability." Chinese Management Studies 8(4): 593–623.doi:10.1108/CMS-09-2011-0066. http://www.emeraldinsight.com/doi/abs/10.1108/CMS-09-2011-0066.

Fornell, Claes, & David F. Larcker. (1981). "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error." *Journal of Marketing Research*, 39–50.

Ghasemi, A., & S. Zahediasl. (2012). "Normality Tests for Statistical Analysis: A Guide for Non-Statisticians." *International Journal of Endocrinology and Metabolism,* 10(2): 486.

Gombachika, Harry S.H., & Gift Khangamwa. (2013). "ICT Readiness and Acceptance among TEVT Students in University of Malawi." Campus-Wide Information Systems, 30(1): 35–43.doi:10.1108/10650741311288805.http://www.emeraldinsight.com/10.1108/10650741311288805.

Hair Jr, Joseph F, Tomas Hult, G M, Christian Ringle, & Marko. Sarstedt. (2013). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Sage Publications.

Haug, Anders, Graungaard Søren Pedersen, & Jan Stentoft Arlbjørn. (2011). "IT Readiness in Small and Medium-sized Enterprises." Industrial Management & Data Systems, 111(4): 490–508.doi:10.1108/02635571111133515.http://www.emeraldinsight.com/doi/abs/10.1108/02635571111133515.

Hayes, A. F. (2009). "Beyond Baron and Kenny: Statistical Mediation Analysis in the New Millenium." Communication Monographs 76: 408–20.

Hu, L T, & P M Bentler. (1999). "Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria versus New Alternatives." Structural Equation Modeling: *A Multidisciplinary Journal* 6(1): 1–55.

Jappelli, Tullio, & Mario Padula. (2011). "Investment in Financial Literacy and Saving Decisions." No. 2011/07. Center for Financial Studies (CFS) Working Paper. , http://nbn-resolving.de/ urn:nbn:de:hebis:30-92954.

Jöreskog, K G. (1967). "A General Approach to Confirmatory Maximum Likelihood Factor Analysis." ETS Research Bulletin Series 2: 183–202.

Jöreskog, K G, & D Sörbom. (1989). "LISREL 7: A Guide to the Program and Applications," no. s: Spss.

———. (1993). "LISREL 8: Structural Equation Modeling with the SIMPLIS Command Language." Scientific Software International.

Kimuyu, P., & J. Omiti. (2000). "Institutional Impediments to Access to Credit by Micro and Small Scale Enterprises in Kenya." Discussion Paper No. 026/2000,. Nairobi.

Kuo, Yen-Lin. (2013). "Technology Readiness as Moderator for Construction Company Performance." Industrial Management & Data Systems, 113(4): 558–72. doi:10.1108/02635571311322793. http://www.emeraldinsight.com/doi/abs/10.1108/02635571311322793.

Lai, Ming-Ling. (2008). "Technology Readiness, Internet Self-Efficacy and Computing Experience of Professional Accounting Students." Campus-Wide Information Systems, 25: 18–29. doi:10.1108/10650740810849061.

Lin, Jiun-Sheng Chris, & Hsing-Chi Chang. (2011). "The Role of Technology Readiness in Self-Service Technology Acceptance." Managing Service Quality, 21: 424–44. doi:10.1108/09604521111146289.

Liñán, Francisco, Juan Carlos Rodríguez-cohard, & José M Rueda-cantuche. (2011). "Factors Affecting Entrepreneurial Intention Levels : A Role for Education." *International Entrepreneurship Management Journal,* 7: 195–218. doi:10.1007/s11365-010-0154-z.

Mankins, John C. (2009). "Technology Readiness Assessments: A Retrospective." Acta Astronautica, 65(9-10). Elsevier: 1216–23. doi:10.1016/j.actaastro.2009.03.058.http://dx.doi.org/10.1016/j.actaastro.2009.03.058.

Marques, Carla S, J Ferreira, Daniela N Gomes, & Ricardo Gouveia Rodrigues. (2012). "Entrepreneurship Education Entrepreneurial

Intention." Education + Training 54(8/9): 657–72. doi:10.1108/00400911211274819.

Martins, Carolina, Tiago Oliveira, & Aleš Popovič. (2014). "Understanding the Internet Banking Adoption: A Unified Theory of Acceptance and Use of Technology and Perceived Risk Application." *International Journal of Information Management*, 34(1): 1–13.doi:10.1016/j.ijinfomgt.2013.06.002.http://linkinghub.elsevier.com/retrieve/pii/S0268401213000844.

Nkundabanyanga, Stephen Korutaro, Denis Kasozi, Irene Nalukenge, & Venancio Tauringana. (2014). "Lending Terms, Financial Literacy and Formal Credit Accessibility." *International Journal of Social Economics,* 41(5): 342–61. doi:10.1108/IJSE-03-2013-0075.http://www.emeraldinsight.com/journals.htm?issn=03068293&volume=41&issue=5&articleid=17110573&show=html.

Nunnally, J. (1978). Psychometric Theory. New York: McGraw-Hill.

OECD. (2005). "Improving Financial Literacy: Analysis of Issues and Policies." The Organisation for Economic Cooperation and Development, no. Paris.

Oh, Jong-Chul, & Sung-Joon Yoon. (2014). "Predicting the Use of Online Information Services Based on a Modified UTAUT Model." Behaviour & Information Technology 33(7): 716–29.doi:10.1080/0144929X.2013.872187.http://www.tandfonline.com/doi/abs/10.1080/0144929X.2013.872187.

Oseifuah, Emmanuel Kojo. (2010). "Financial Literacy and Youth Entrepreneurship in South Africa." *African Journal of Economic and Management Studies,* 1(2): 164–82. doi:10.1108/20400701011073473.

Parasuraman, A. (2000). "Technology Readiness Index (Tri): A Multiple-Item Scale to Measure Readiness to Embrace New Technologies." *Journal of Service Research*, 2(4): 307–20. doi:10.1177/109467050024001.

Podsakoff, P.M, S.B MacKenzie, J-Y Lee, & N.P. Podsakoff. (2003). "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies." *Journal of Applied Psychology*, 88(5): 879 – .

Podsakoff, P.M., & Dennis Oran. (1986). "Self-Reports in Organizational Research: Problems and Preospects." *Journal of Management*, 12(4): 928–40. doi:0803973233.

Ramasesha, B, R.P.J Kingshott, & Alisha Stein. (2015). "Firm Self-Service Technology Readiness." *Journal of Service Management,* 26(5): 751–76.

Richey, Gleen R., & Chad W. Autry. (2009). "Assessing Interfirm Collaboration/technology Investment Tradeoffs." *The International Journal of Logistics Management*, 20(1): 30–56.doi:10.1108/09574090910954837.http://www.emeraldinsight.com/doi/abs/10.1108/09574090910954837.

Riffai, M. M. M. A, K. Grant, & D. Edgar. (2012). "Big TAM in Oman: Exploring Thepromise of on-Line Banking, Its Adoption by Customers

and the Challenges of banking in Oman*." International Journal of Information Management,* 32(239-259).

Rod, K.D., P.S. Ruth, L.M. Kerry, D. Marsha, & R.P. Russell. (2013). "Construct Validity of Selected Measures of Physical Activity Beliefs and Motives in Fifth and Sixth Grade Boys and Girls." *Journal Of Pediatric Psychology*, June 38(5): 563–76 doi: 10.1093/jpepsy/jst013.

Schermelleh-Engel, K Moosbrugger, H, & H Müller. (2003). "Evaluating the Fit of Structural Equation Models: Tests of Significance and Descriptive Goodness-of-Fit Measures." Methods of Psychological Research Online 8(2): 23–74.

Shivers-Blackwell, Sheryl L., & Atira C. Charles. (2006). "Ready, Set, Go: Examining Student Readiness to Use ERP Technology." *Journal of Management Development*, 25(8): 795–805. doi:10.1108/02621710610684268.

Singhry, Hassan Barau. (2015). "Comparing the Financial Literacy and Technopreneurship Behaviour of Unemployed and Employed Graduates." *Asia Journal of Business and Economics* (Social Science Asia), 1(3 (March)): 105–16. doi:10.14456/ssa.2015.25.

Solesvik, Marina Z, Paul Westhead, Lars Kolvereid, & Harry Matlay. (2012). "Context Student Intentions to Become Self-Employed : The Ukrainian Context." *Journal of Small Business and Enterprise Development*, 9(3): 441–60. doi:10.1108/14626001211250153.

Sophonthummapharn, Kittipong, & George Tesar. (2007). "2007 - Technology Readiness and Propensity of Cell Phone Users To Subscribe To Commercial Messaging Services." *The Marketing Management Journal*, 17(2): 81–95.

Sudman, Seymour, Andrew Greeley, & Leonard Pjnto. (1965). "The Effectiveness of Self-Administered Questionnaires." *Journal of Marketing Research,* II: 293–97.

Szolnoki, Gergely, & Dieter Hoffmann. (2013). "Online, Face-to-Face and Telephone surveys—Comparing Different Sampling Methods in Wine Consumer Research." Wine Economics and Policy, 2(2): 57–66.

Tabachnick, B G, & L S Fidell. (2001). "Using Multivariate Statistics."

Tsourela, Maria, & Manos Roumeliotis. (2015). "The Moderating Role of Technology Readiness, Gender, & Sex in Consumer Acceptance and Actual Use of Technology-Based Services." *The Journal of High Technology Management Research. Elsevier Inc.*, -.doi:http://dx.doi.org/10.1016/j.hitech.2015.09.003.http://www.sciencedirect.com/science/article/pii/S1047831015000218.

Vaaler, Paul M., & Gerry McNamara. (2010). "Are Technology-Intensive Industries More Dynamically Competitive? No and Yes." Organization Science, 21(1): 271–89. doi:10.1287/orsc.1080.0392. http://pubsonline.informs.org/doi/abs/10.1287/orsc.1080.0392.

Venkatesh, Viswanath, Y. L. Thong James, & Xiu Xu. 2012. "CONSUMER A CCEPTANCE AND USE OF INFORMATION TECHNOLOGY : EXTENDING THE UNIFIED THEORY." MIS Quarterly, 36(1): 157–78.

Venkatesh, Viswanath, Michael G Morris, Gordon B Davis, & Fred D Davis. 2003. "USER ACCEPTANCE OF INFORMATION T ECHNOLOGY: TOWARD A UNIFIED VIEW." MIS Quarterly, 27(3): 425–78.

Venkatesh, Viswanath, James Y L Thong, Frank K Y Chan, Paul Jen-hwa Hu, & Susan A Brown. (2011). "UTAUT Predictors and the Role of Context." *Information System Journal*, 21: 527–55. doi:10.1111/j.1365-2575.2011.00373.x.

Vinogradov, Evgueni, Lars Kolvereid, & Konstantin Timoshenko. (2013). "Predicting Entrepreneurial Intentions When Satisfactory Employment Opportunities Are Scarce." Education + Training Training, 55(7): 719–37. doi:10.1108/ET-06-2012-0067.

Vize, Róisín, Joseph Coughlan, Aileen Kennedy, & Fiona Ellis-Chadwick. (2013). "Technology Readiness in a B2B Online Retail Context: An Examination of Antecedents and Outcomes." Industrial Marketing Management, 42(6). Elsevier Inc.: 909–18. doi:10.1016/j.indmarman.2013.05.020.http://dx.doi.org/10.1016/j.indmarman.2013.05.020.

Wu, Yu-Lung, Yu-Hui Tao, & Pei-Chi Yang. 2008. "The Use of Unified Theory of Acceptance and Use of Technology to Confer the Behavioral Model of 3G Mobile Telecommunication Users." *Journal of Statistics and Management Systems,* 11(5): 919–49.doi:10.1080/09720510.2008.10701351. http://www.tandfonline.com/doi/abs/10.1080/09720510.2008.10701351.

Zahra, S A, & J C Hayton. (2004). "Technological Entrepreneurship: Key Themes and Emerging Research Directions." Crossroads of Entrepreneurship. Kluwerm, Boston, 185–208

APPENDIX: A

QUESTIONNAIRE

Technological optimism	TO1	Technology gives me control over daily operations
	TO2	Businesses that use the newest technology is more convenient
	TO3	I prefer to use the most advanced technology
	TO4	Technology makes me more efficient in my profession
	TO5	Learning about technology is rewarding to me
Technological innovativeness	TI1	Many people come to me for advice on new technologies.
	TI2	It seems my friends are learning less about the newest technologies than I am.
	TI3	I am among the first in my circle of friends to acquire new technology when it appears.
	TI4	I can figure out how to use new technology without much help from others
	TI5	I have fewer problems than other people in making technology work for me
	TI6	Many people come to me for advice on new technologies.
Technological discomfort	TD1	Sometimes, I think that technology systems are not designed for use by ordinary people.
	TD2	When I get technical support from a provider of a high-tech product or service, I sometimes feel as if I am being taken advantage of by someone who knows more than I do
	TD3	It is embarrassing when I have trouble with a high-tech gadget while people are watching.
	TD4	New technology makes it too easy for other people to spy on my work.
	TD5	Technology always seems to fail at a time I least expect
Technological insecurity	TS1	I do not consider it safe giving out a credit card number over an internet
	TS2	I do not consider it safe to do any kind of financial business online.
	TS3	I worry that information I send over the Internet will be seen by other people
	TS4	If I transmit information electronically, someone may use that information against me
Effort expectancy	EE1	Learning how to use modern technology is easy for me.

	EE2	My interaction with modern technology is clear and understandable.
	EE3	It is easy for me to become skillful at using modern technology.
Performance expectancy	PE1	I find the use of modern technology useful in my daily life.
	PE2	Modern technology increases my chances of achieving things that are important to me.
	PE3	Modern technology helps me accomplish tasks more quickly.
	PE4	Modern technology increases my productivity.
Social influence	SI1	People who are important to me think that I should use modern technology.
	SI2	People who influence my behaviour think that I should use modern technology.
	SI3	People whose opinions that I value think that I use modern technology.
Facilitating condition	FC1	I have the resources necessary to use modern technology.
	FC2	I have the knowledge necessary to use modern technology.
	FC3	Present technology is compatible with other technologies I use.
	FC4	I can get help from others when I have difficulties using modern technology.
Hedonic motivation	HM1	Using modern technology is fun.
	HM2	Using modern technology is enjoyable.
	HM3	Using modern technology is very entertaining.
Price value	PV1	Modern technology is reasonably priced.
	PV2	Modern technology has a good value for the money spent.
	PV3	At the current price, modern technology provides a good value.
	PV4	Modern technology are becoming more cheaper these days
Habit	HA1	The use of modern technology has become a habit for me.
	HA2	I am addicted to using up-to-date technology.
	HA3	I must use up-to-date technology.
Financial literacy	FL1	I find it more satisfying to spend money than save for business tomorrow
	FL2	I prefer to buy things on credit than pay outright cash
	FL3	I am very organized when it comes to managing my money

	FL4	I am never late at paying my bills
	FL5	I have the skill to be well-informed about financial changes in the economy,
	FL6	I have the knowledge to keep track of new business financing options
	FL7	I have the ability to develop relationships with key people who are connected to capital sources
Technopreneurial behaviour	TB1	I have a dream of becoming an entrepreneur that use modern technology
	TB2	I will make every effort to start and run a technology-intensive business
	TB3	I am determined to create a technology-intensive firm in the future
	TB4	I have very seriously thought of starting a technology-intensive business
	TB5	I will prefer to be a business owner/manager than being employed by someone