THESIS OF THE DOCTORAL (PHD) DISSERTATION

EXAMINE EMERGING LEADERSHIP COMPETENCIES AND TECHNOLOGY ACCEPTANCE: A STUDY OF SMALL AND MEDIUM ENTERPRISES (SME) IN THE UPPER EAST REGION, GHANA

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2025

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INTRODUCTION

There has been a wide variety of literature on labour competencies and development, especially where the small and medium-sized enterprises (SMEs) and leadership roles in economic growth appear stronger and much appreciated in employment and poverty alleviation. It is confirmed that SMEs require up-to-date competencies to improve human relations, productivity and efficiency to reduce poverty (FUGAR et al., 2013). Small and medium-sized enterprises (SMEs) are economic activities that have no regulatory legal framework to check quality and standards for productivity and labour requirements (NIÑO-ZARAZÚA & SANTILLÁN-HERNÁNDEZ, 2021). Ghana's youth unemployment rate of 5.5% is attributed to the continuous collapse of SMEs (GHANA STATISTICAL SERVICE, 2024). Governments in the past and current keep struggling to stabilize the situation. Regional ministers of many regimes of the sub-regions have announced numerous programs to eliminate economic suffering among the youth and the future generation, but they failed to achieve anticipated excellent results and expected signs of sustained growth and novelty (ABISUGA-OYEKUNLE et al., 2020). The government of Ghana, for instance, in 1983 implemented the Economic Recovering Program supervised by the World Bank and the International Monetary Fund (IMF) to turn around the economy (OPOKU, 2016). Besides, the recent Debt Exchange Programme launched in 2022 is intended to meet the IMF bailout conditionality to ease the economic hardship of Ghanaians.

Most people in the Upper East Region of Ghana live under the international poverty line of US$1.90 per day (GHANA STATISTICAL SERVICE, 2021). The economic uncertainty in the region is attributed to low productivity, which often leads to the continuous closure of businesses and has aggravated unemployment in the region and the country as a whole. The lack of leadership competencies and the inability of SMEs to stay long in business to complement government efforts in solving the problem of unemployment have become a major concern to everyone in the region and Ghana at large. This is manifested since many people living in the Upper East Region, one of the deprived regions in Ghana cannot have three daily square meals and access to quality health services and education (OPOKU, 2016). Figure 1 depicts the absolute locations of the Upper East Region, its municipalities and districts. The region has two

tropical climatic seasons, namely the rainy season (April – November) and the dry season (December – March).

Figure 1: Upper East Region Districts and Municipalities Map.
Source: GHANA STATISTICAL SERVICE, (2021)

The region is endowed with natural resources such as sand, clay and rock deposits which are extracted for various purposes like construction and ceramic. There are also some deposits of gold and pockets of small-scale manual quarrying activities in some parts of the districts. The people are also involved in food processing, notably among them are ground nuts, Shea nuts and *Dawa Dawa*. Handicraft works like basket weaving and leather work are some other Economic activities in the region. According to the GHANA STATISTICAL SERVICE (2021), the region shares boundaries with Burkina Faso to the north, Togo to the east, the Upper West Region to the west, and the North-East Region to the south suggesting it has diverse economic opportunities (figure 1).

1. INTRODUCTION OF THE TOPICS AND OBJECTIVE

The study sought to ascertain how emerging leadership competencies and technology acceptance in management enable SME sustainability. The study advances the technology acceptance model (TAM) to elucidate the unified nature of technology and competencies. This research explains the relationships between technology and SME leadership competencies requirements for sustainable growth and development. The investigation is crucial to business organizations as it examines the emerging competencies' compatibility with technology acceptance in the management of SMEs. The study specifically seeks to

1. Assess leadership and support dynamics' influence on leadership competencies.
2. Evaluate required competence for SME leadership behaviour.
3. Explore managerial leadership as a moderator of competence development and technology acceptance.
4. Examine the relationships of strategy development indicators
5. Evaluate potential prospects of technologically integrated competencies.
6. Design a model that combines competencies and technology for SME leaders.

1.1. Research Questions

This study finds out to what extent SME competencies are integrated into technology to achieve business growth and sustainability in the Upper East Region of Ghana. The study answers the following specific questions.

1. What are the impacts of leadership and support dynamics on SME competence development?
2. What are the required competencies for SME leadership behaviour?
3. To what extent does managerial leadership moderate competence and technology acceptance?
4. What are the relationships between strategy development indicators
5. What are the potential prospects of technologically integrated competencies?
6. What model is recommended for competence and technology integration?

1.2. Contribution to Knowledge

The scientific relevance of this study cannot be overemphasised since the outcome of the study contributes substantial new knowledge of SME competencies development needs to the database of business and management studies. The results of this study present a proposal that supports technology application and encourages SME leadership and government strategies for SMEs' continuous development. Successful completion of the research is expected to add to the intellectual discourse on the changing trends of management science.

The study provides empirical data for managers to view the effects of emerging technologies on leadership competencies and SME sustainability as interpretive for change in organizational settings. The results bring about an understanding of management thinking of principles underlying the process of management, the nature of management, organizational behaviour and why attention should be given to emerging technologies and their effects on leadership competencies and SMEs' sustainability in the informal sector.

1.3. Technology Competencies Integrated Model

This study focuses on the concept of technological acceptance in the analysis of competencies regarding SME development and sustainability in the Upper East Region of Ghana. How effective is technology in leadership development and how supportive technology and innovation are for SME development in the region were considered paramount in the analysis.

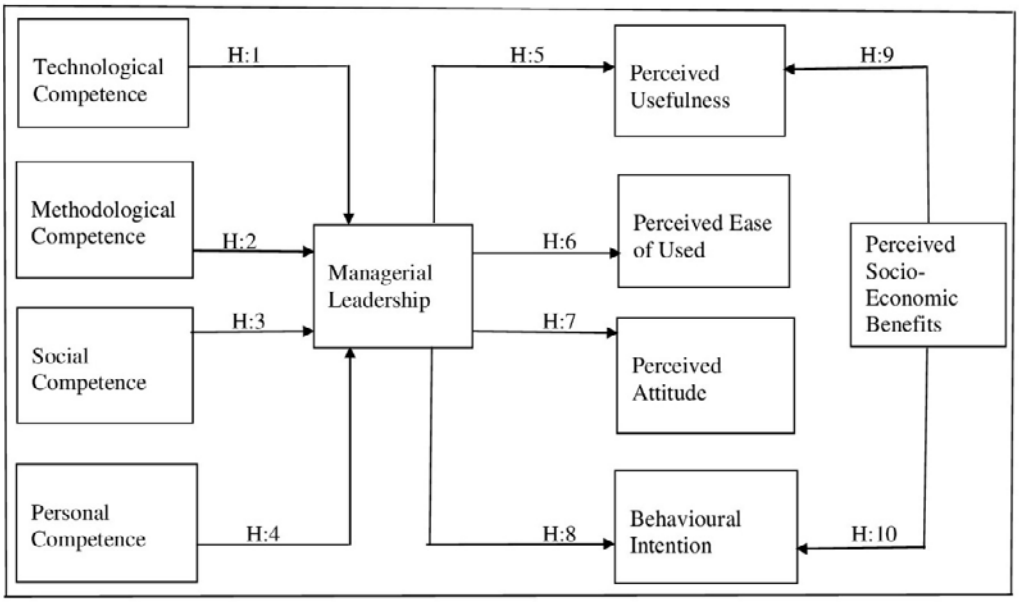

Figure 2: Technology-Competence Integrated Model (TCIM)

Source: Author's Creation

This model incorporates aspects of TAM into the emerging competencies to appreciate SME management requirements. It suggests that for technology to be effectively adopted, users must not only be willing to use it but also possess the necessary competencies. The TCIM is drawn from an existing model Technology Acceptance Model (TAM).

1.4. Study Hypotheses

H1: Leadership and support dynamics influence leadership competencies

H1a: Socioeconomic benefits significantly and positively influence SME competence development.

H1b: Leadership behaviour has a significant and positive impact on SME competence development.

H1c**:** Supportive factors have a significant influence on SME competence development.

H2: Competence significantly impacts SME leadership behaviour

H2a: Social competence has a positive influence on SME leadership behaviour.

H2b: Methodological competence has a direct and positive effect on leadership behaviour.

H2c: Personal competence significantly influences SME leadership behaviour.

H2d: Technological competence has a significant and positive effect on SME leadership behaviour.

H3: Managerial leadership moderates the impact of TAM on competencies development

H3a: Managerial leadership moderates the effects of socioeconomic benefits and Perceived usefulness.

H3b: Managerial leadership moderates the effects of socioeconomic benefits and perceived behavioural intentions.

2. MATERIALS AND METHODS

The study adopts a quantitative method with an open questions approach to data collection to explore the integration of emerging leadership competencies and technology acceptance within the SME in the Upper East Region of Ghana. The questionnaire was designed based on the four theoretical frameworks: Competency-Based Theory (CBT), Resource-Based Theory (RBT), Human Capital Theory (HCT) and Social Exchange Theory (SET) and guided by Technological Competencies Profile (TCP), the European e-Competence Framework (FTI, 2012). CBT guides the development of the questionnaire by helping to identify specific competencies and behaviours that contribute to effective leadership within SMEs. RBT was applied in developing the questionnaire through the categorization of SME internal IT infrastructure and leadership competencies. HCT formed part of the questionnaire designed to justify and examine the level of training and education of leadership. It was particularly useful in the demographic characteristics section of the questionnaire. SET took centre stage in the questionnaire as it offered into insight relational dynamics, specifically in the context of technology acceptance and implementation. The entire questionnaire design was under the guidance of the Technological Competencies Profile (TCP), the European e-Competence Framework regarding technological competencies, internal and external environment and communication, training, and innovation constructs. The quantitative methodology leverages surveys with Likert-scale questions to gauge leadership competencies and technology acceptance with the SME. The technology acceptance model (TAM) forms the background for evaluating SME leaders' behavioural intent, perceived usefulness and perceived ease of use.

Sampling Procedures

There was no confirmed data on the entire SME population in the region either from the websites or the authorities in the selected municipality and the districts. However, data on registered SMEs in various sectors were obtained from the office of the Ministry of Trade and Industry, Bolgatanga. The data were not representative of the SMEs as they represented only a few registered SMEs in the region. Therefore, the COCHRAN'S (1977) sampling technique where both the population size and proportion are unknown was applied as illustrated below.

$$n_0 = \frac{Z^2.\ P.\ (1-P)}{e^2}$$

Where

n_0 = required sample size

Z = Z-score (based on confidence level, e.g. 1.96 for 95% confidence).

P = estimated proportion of the population with the characteristics of interest (If the unknown, use for maximum variability).

e = margin of error (e.g. 0.05 for ±5% error).

For a 95% confidence level, 50% variability (P = 0.5), and a 5% margin of error (e = 0.05).

$$n_0 = \frac{(1.96)^2 \times 0.5 \times (1-0.5)}{(0.05)^2} = 384$$

The application of the COCHRAN (1977) sampling technique shows that a sample of 384 respondents was deemed appropriate for this study. The study deployed stratified sampling in which SMEs in these two districts and a municipal were considered in the survey. The stratified random sampling ensures a broad representation across different business sectors and sizes. The decision to settle on the Builsa North District, the Tempane District and the Bolgatanga Municipal was based on their geographical locations. Regarding growth and sustainability

resulting from technologically aided competencies, organizational leaders, and those who owned firms or occupied managerial positions were targeted. Through the stratified sampling of SMEs, the artisans and local manufacturers as respondents were contacted for responses on their technological skills and competencies. OLÁH et al. (2017) posit that sampling is a process of choosing from a much larger population, a group that a generalized statement made from selected parts and can simply represent the entire group. Sampling is a technique employed for gathering information from a smaller group that could accurately represent the entire population (ADEBI-CAESAR, 2012).

The data on each sector obtained from the office of the Ministry of Trade and Industry together with the results (384) obtained from COCHRAN'S (1977) sampling technique were used to calculate the stratum for various sectors in each participating district and municipality and presented in Table 1. The population was divided into subgroups (strata) based on common characteristics, using the stratum proportional allocation formula.

$$n^h = [\frac{Nh}{N}] \times n$$

Where

N^h = Population of strata (145)

N = Total population size (857)

n = Total sample size (384)

n^h = Stratum

Table 1: Sampling Participated Sectors

Sector	Bolga Municipal	Stratum	Builsa District	Stratum	Tampane District	Stratum
Agriculture	145	65	120	54	65	29
Manufacturing	48	21	45	20	34	15
Services/activities	200	90	104	47	96	43
Total	**393**	**176**	**269**	**121**	**195**	**87**

Source: Author's Creation

2.1. Data Collection Methods

The studies collected two types of data namely primary and secondary data. The primary data were obtained from SME leaders (artisans and local manufacturers) whose firms operate in the Builsa North district, Tempane district and the Bolgatanga municipality while the secondary data was obtained from libraries, the internet and literature earlier authored by others in textbooks and journals. The five Likert scale questionnaires which one section, number one (1) representing "Strongly Disagree" and number five (5) representing "Strongly Agree", and another sector, number five (5) represents "Very Important" and one (1) representing "Not Important" with the three open questions at the bottom were administered to the 384 respondents supported by the services of four (4) graduate students. They distributed questionnaires directly to members of the management team (Business owners, General managers, HR managers, and unit or department heads of artisans and local manufacturers). A pre-testing of the questionnaire was done on thirty (30) SMEs outside the sample started on 18th – 30th June 2023. Minor restructures and corrections of errors were made on the instrument after the pre-testing of it. The actual data collection began on 5th July – 10th September 2023. Irrespective of the full cooperation pre-established with the firms, a few respondents in some SMEs were not that cooperative in response to the questionnaires for reasons best known to them. Their action would have badly affected the outcome of the study, but for patience, persistent visits and persuasion, the survey was a successful exercise. It was the continuous meetings and opportunities to explain and appeal to respondents that yielded the successful collection of the data for the study in some of the organizations.

2.2. Analysis of the Data

A total of 384 questionnaires were distributed to three hundred and eighty-four SMEs targeting leaders or owners or managers in two districts and a municipality in the Upper East Region, Ghana. A total of 372 questionnaires were retrieved representing 97%. At the end of the fieldwork, only 360 responses were suitable for data analysis due to duplication and incomplete questionnaires. The data collected were transcribed, coded and checked for consistency. Data will be presented using the SPSS software with multiple regression analysis employed, and the partial least square approach Smart PLS 4.0 (RINGLE et al., 2015) to determine the extent of

leadership influence on technology acceptance. This approach facilitates statistical validation of key hypotheses and regional business insights. The study analyses the effect of leadership as a moderator between technology acceptance and SME competence development using nine (9) constructs with fifty (50) variables and three open questions to answer the main research question, *"To what extent does SME competencies development coupled with technology achieve business growth and sustainability in the Upper East Region of Ghana?"* The data on the open questions are analyzed using thematic analysis to extract key patterns to understand leadership opinions regarding potential prospects of technologically integrated competencies within SME competence development. "*Thematic Analysis is a method for systematically identifying, organizing, and offering insight into, patterns of meaning (themes) across a dataset. Through focusing on meaning across a dataset"* (BRAUN & CLARKE 2012). The manual thematic analysis is more appropriate and practical. Description-focused coding that describes the responses of the respondents to the specific questions will be applied and followed by a descriptive report with verbatim quotations from the respondents.

3. RESEARCH MAIN FINDINGS

Reliability of a dataset explains the consistency of findings of research which is associated with multi-scale items. A construct is considered reliable and acceptable when an α is greater than or equal to 0.6. The Cronbach Alpha reliability test was used to ascertain the reliability coefficient of the constructs under consideration. The reliability of the constructs is tested and presented in Table 2.

Table 2: Reliability Test

Constructs	Codes	Cronbach's Alpha	No. of Items
Technological Competence	TC	.946	5
Methodological Competence	MC	.884	7
Social Competence	SC	.881	7
Personal Competence	PC	.940	5
Supportive Factors	SF	.930	3
Managerial Leadership	ML	.880	3
Perceived Usefulness	PU	.981	7
Perceived Ease of Use	PEU	.943	6
Leadership Behaviour	LB	.915	6
Human Capital	HC	.942	5
Attitude Towards Usage	ATU	.857	5
Perceived Risks of Use	PRU	.843	6
Perceived Behavioural Intention	PB	.896	5
Competence Development	CD	.930	5
Socio-Economic Benefits	SEB	.894	5

Source: Author's Creation

The results show a strong reliability coefficient for each construct. The Cronbach Alpha obtained a maximum coefficient of .981(98.1%) and a minimum coefficient of .843 (84.3%) indicating that constructs had excellent internal consistency demonstrated in Table 2.

H1: Leadership and support dynamics influence leadership competencies

The Cronbach's alpha reliability analysis in Table 2 shows that socio-economic benefits = .89, leadership behaviour = .92, competence development = .93 and supportive factors = .93. The analysis met the assumption of multicollinearity given that the tolerance value ranges from 0.67

to 1.00 while the value inflation factor (VIF) ranges from 1.00 to 1.49 indicating that multicollinearity is not found in this study, because tolerance values greater than 0.1 and VIF less than 10 are acceptable (SHRESTHA, 2021). The results of hierarchical regression in Table 3 conclude that the inclusion of H1a: socioeconomic benefits accounted for 12.5% variance in competence development R^2 =0.13, ΔR^2 = 0.13, F (1, 358) = 51.21, P < .001 and evidence of significant effects of socioeconomic benefits on the SME competence development (ß = .35, CI = .28, .49, P < .001).

Table 3: Hierarchical Regression Results

Competencies Development						
	Model 1		Model 2		Model 3	
Variables	**ß**	**CI**	**ß**	**CI**	**ß**	**CI**
SEB	.354***	.280, .492	.294***	.280, .492	.191***	.091, .327
LB			.159***	.247, .257	.071***	.034, .175
SF					.292***	.191, .420
Model Fit Statistics						
F - Values	51.206***		8.450***		28.515***	
R^2	.125 (12.5%)		.145 (14.5%)		.207 (20.7%)	
ΔR^2	.125 (12.5%)		.025 (2.5%)		.061 (6.1%)	

Note: ***P < .001.

Source: Author's Creation

The inclusion of H1b: leadership behaviour added 12% variance in predicting SME competence development R^2 = 0.25, ΔR^2 = 0.12, F (1, 357) = 58.9, P < .001, and an indication of significant effects of leadership behaviour on SME competence development (ß =.38, CI = .28, .47, P < .001). The addition of H1c: supportive factors (available and accessible credit facilities and favourable state policies on IT) added 2.4% variance in predicting SME competence development R^2 = 0.27, ΔR^2 = .02, F (1, 356) = 11.6, P < .001, and showing evidence of significant effects of a supportive factor in SME competence development (ß =.19, CI = .08, .31,

P < .001). Therefore, the entire hypothesis H1: demonstrated a positive and statistically significant influence on SME leadership competencies development and it is accepted.

H2 Competence Significantly Impacts SME Leadership Behaviour

The hypothesis in Table 4 tests if the perceived required competencies which included social competence, methodological competence, and personal competence have a significant impact on leadership behaviour.

Table 4: Leadership Competencies

Competence	Unstandardized Coefficients		Standardized Coefficients	T	Sign.
	B	Std. Error	Beta		
Social	.308	.073	.262	4.242	.000
Methodological	.387	.080	.307	4.849	.000
Personal	.192	.043	.203	4.497	.000
Technological	.031	.055	.030	.568	.570
Model fit statistics					
F values	(4, 73.304)***				
R Square	.452				
Adjusted R square	.446				
VIF values	(1.318, 2.605)***				

Source: Author's Creation

The results significantly predicted leadership behaviour (LB), F (3, 355) = 73.304, P < .001, which indicates that the H2a: social competence SC (ß = .262, t = 4.242, p < .001) plays a significant role in SME leadership behaviour. The study predicts H2b: a positive correlation between SME leadership behaviour and methodological competence which MC (ß = .307, t = 4.849, p < .001) shows a positive correlation between the leadership behaviour and methodological competence, The testing of the 2Hc: personal competence influence on the SME leadership behaviour revealed that personal competence PC (ß = .203, t = 4.97, p < .001) have a significant influence on leadership behaviour. Therefore, the test of perceived required integrated social, methodological and personal competencies influence on leadership behaviour is statistically significant, hence H2a, 2Hb and 2Hc are all accepted. However, testing 2Hd: if there is a positive connection between leadership behaviour and technological competence, the results

revealed that technological competence H2d: TC (ß = .030, t = .568, p < .570) has no bearing on the SME leadership behaviour and is statistically not significant (Table 4). Therefore, H2d is rejected.

Correlation of Key Constructs

The "rs" indicates Spearman's rank-order correlation, a non-parametric measure of the strength and direction of association between two ranked variables. The correlation coefficients range from negative one (-1) to positive one (1) with general values indicating .70 to 1.00 as strong, .40 to .69 as moderate and .10 to .39 as weak correlations. The p-value indicates the significance of the variable's association. In social science the threshold of p<.05 shows it is statistically significant and p<.001 indicates higher significance. The results in Table 5 show that all the variables are statistically significant and positively correlated.

Table 5: Key Construct

V	M	SD	TC	MC	SC	PC	SF	ML	PU	PE	LB	HC	AT	PR	PB	CD	SE
TC	4.38	.829	1														
MC	4.33	.684	.633**	1													
SC	4.29	.732	.588**	.746**	1												
PC	4.35	.861	.460**	.607**	.602**	1											
SF	4.47	.864	.497**	.556**	.512**	.453**	1										
ML	4.37	.909	.477**	.566**	.481**	.448**	.480**	1									
PU	4.37	.929	.407**	.464**	.407**	.360**	.417**	.441**	1								
PE	4.35	.904	.455**	.540**	.539**	.516**	.467**	.521**	.314**	1							
LB	4.17	.911	.403**	.420**	.458**	.464**	.420**	.311**	.337**	.362**	1						
HC	4.37	.912	.542**	.555**	.532**	.517**	.438**	.438**	.368**	.508**	.481**	1					
AT	4.18	.800	.446**	.459**	.406**	.360**	.400**	.451**	.414**	.454**	.229**	.322**	1				
PR	4.07	.862	.472**	.541**	.421**	.482**	.387**	.438**	.335**	.416**	.306**	.442**	.454**	1			
PB	4.23	.802	.420**	.521**	.493**	.361**	.423**	.415**	.350**	.417**	.283**	.390**	.379**	.443**	1		
CD	4.20	.904	.384**	.515**	.449**	.454**	.410**	.452**	.310**	.439**	.269**	.372**	.357**	.432**	.460**	1	
SE	4.16	.828	.404**	.465**	.434**	.352**	.461**	.340**	.398**	.407**	.389**	.358**	.374**	.330**	.341**	.354**	1

******Correlation is significant at the 0.01 level (2-tailed)

Source: Author's Creation

There is a moderate positive relationship between managerial leadership (ML) and Perceived Usefulness (PU) (rs = .441, p-value = .001) suggesting that as managerial leadership improves, the perceived usefulness also increases. The results demonstrate high mean scores and moderate standard deviation scores, for instance, the perceived usefulness (PU) mean and standard deviation scores M=4,37 (SD = 0.929) indicate respondents generally perceive technology acceptance competence integration as important in SMEs, though with moderately consistent agreement across the study sample. The results in Table 6 emphasize the crucial role of leadership in moderating and supporting the integration of competencies into the technology acceptance model (TAM).

H3: Managerial leadership significantly influences technology acceptance in SME competence development

Table 6 presented the results of the hypotheses on H3: managerial leadership moderating the impact of TAM on competencies development where all the findings except one indicated insignificant p-values. The results revealed that managerial leadership significantly influenced the relationship between TAM and competencies, except SC -> ML -> PEU (see Table 15). The relationship between social competence (SC) and perceived ease of use (PEU) SC -> ML -> PEU, has no bearing on and no significance to managerial leadership (ML) (ß = .025, t = 0.730 p < .0.465). The results revealed that the relationship between personal competence (PC) and the perceived attitude (ATU) of the leaders towards technology (PC -> ML -> ATU) is statistically and significantly impacted by managerial leadership (ML) (ß = 0.061, t = 2.037, p < 0.042). The results further show that managerial leadership (ML) statistically and significantly influenced the relationship between methodological competence and perceived ease of use (MC -> ML -> PEU), that is (ß = 0.184, t = 3.616, p < 0.000). Besides, managerial leadership (ML) positively moderated between personal competence (PC) and perceived ease of use (PEU), this implies PC -> ML -> PEU is statistically and significantly influenced by managerial leadership (ML) (ß = 0.070, t = 2.046, p < 0.041), Additionally, managerial leadership (ML) has a positive influence on the relationship between technological competence (TC) and attitude towards use (ATU). This explains TC -> ML -> ATU has statistical and significant influence (ß = 0.076, t = 2.366, p < 0.018) as demonstrated in Table 6.

Table 6: Hypothesis

Constructs	Beta coefficient	Standard deviation	T statistics	P values	Remarks
ML moderates the relationship between PC and ATU	0.061	0.030	2.037	0.042	Accepted
ML moderates the relationship between MC and PEU	0.184	0.051	3.616	0.000	Accepted
ML moderates the relationship between PC and PEU	0.070	0.034	2.046	0.041	Accepted
ML moderates the relationship between TC and ATU	0.076	0.032	2.366	0.018	Accepted
ML moderates the relationship between SC and PEU	0.025	0.034	0.730	0.465	Rejected
ML moderates the relationship between TC and PEU	0.087	0.036	2.455	0.014	Accepted
ML moderates the relationship between TC and PU	0.036	0.017	2.154	0.031	Accepted
ML moderates the relationship between MC and ATU	0.161	0.046	3.512	0.000	Accepted
ML moderates the relationship between SEB and PB	0.261	0.030	8.707	0.000	Accepted
ML moderates the relationship between SEB and PU	0.163	0.035	4.698	0.000	Accepted

Source: Author's Creation

Managerial leadership (ML) positively moderates the relationship between technological competence (TC) and perceived ease of use (PEU), TC -> ML -> PEU is statistically and significantly influenced by managerial leadership (ML) (ß = 0.087, t = 2.455, p < 0.014). Managerial leadership (ML) positively moderates the relationship between technological competence (TC) and perceived usefulness (PU) which means TC -> ML -> PU is statistically and significantly influenced by managerial leadership (ML) (ß = 0.036, t = 2.154, p < 0.031). Table 6, the results show that managerial leadership (ML) significantly influenced the relationship between methodological competence (MC) and attitude towards technology use

(ATU), that is MC -> ML -> ATU which means (ß = 0.161, t = 3.512, p < 0.000). Similarly, H3a: managerial leadership (ML) significantly and positively influenced the relationship between socioeconomic benefits (SEB) and perceived behavioural intentions (PB), that is SEB -> ML -> PB (ß = 0.261, t = 8.707, p < 0.000), and H3b: managerial leadership (ML) significantly and positively influenced the relationship between and socioeconomic benefits (SEB) and perceived usefulness (PU), SEB -> ML -> PU (ß = 0.163, t = 4.698, p < 0.000).

Results of Recommended Model for SME Competence Development

Managerial leadership is core in workforce and infrastructure development and a key ingredient in technology and competence integration in any given organization. An application of technique and science has a positive and tremendous impact on individual and SME development as shown in Figure 3. Leadership stimulates the socio-economic benefits of the applications. This leads to the desire for further training and development which determines their attitude towards the perceived usefulness of the product and psychologically attempted with perceived ease of use.

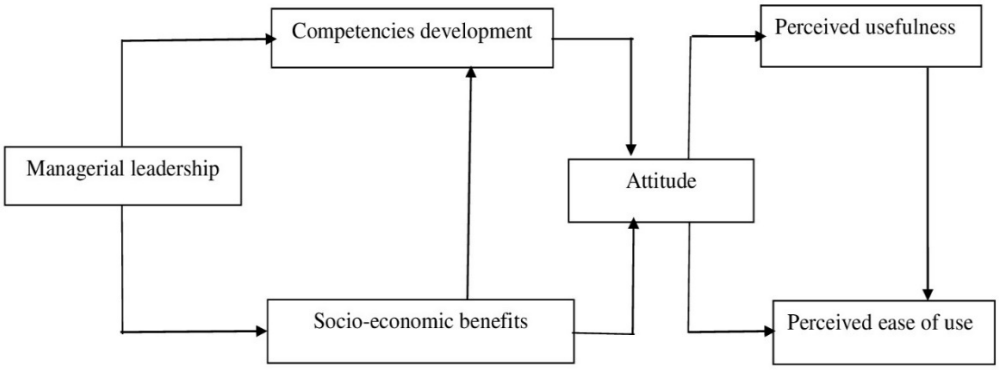

Figure 3: Technology Acceptance Competence Integrated Model
Source: Author's Creation

The mode provides insights into the relationships between technology and leadership competencies development with managerial leadership as a moderator between competencies and the TAM. The model highlights the importance of aligning management technology and competencies to survive potential challenges. Also, this model combines competency theory, from the perspective of managerial leadership, resource-based theory, from the viewpoint of competencies development, human capital theory from the standpoint of attitude, and social exchange theory, from the assessment of socioeconomic benefits. The results on technology-

competence integration positively established in this study formed the modification of TAM to propose TACIM.

Report of the Open Questions

A descriptive report of the themes and *verbatim quotations* from respondents is presented while Figure 4 demonstrates the main themes describing the responses of the respondents to specific questions about the potential prospects of technologically integrated competencies within the SME.

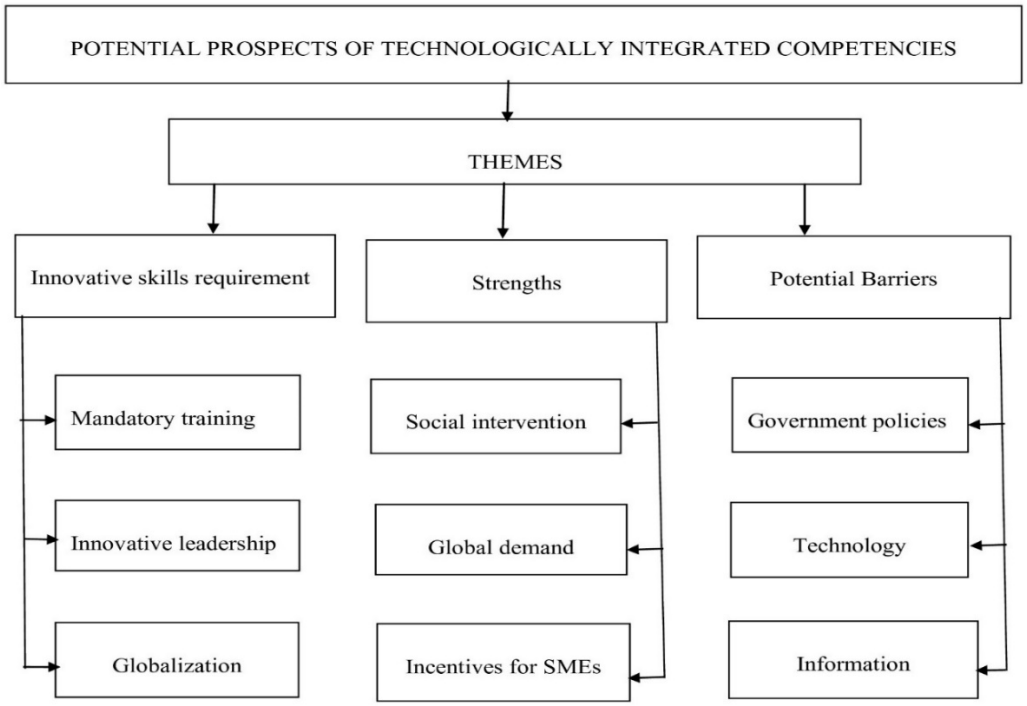

Figure 4: Main Themes
Source: Author's Creation

Figure 4 shows the competencies that an individual requires to work effectively and remain relevant in emerging technologies according to the participants. To maintain relevance, there must be mandatory training for leaders to acquire new knowledge at all times. The participants said SME leadership should be given training in relevant political decisions on sustainable SMEs. They advocated compulsory and continuous training programmes such as marketing, investment and customer relations for SMEs emphasizing entrepreneurial skills training.

A participant said: *"Management of SMEs requires knowledge of technology to understand data and trends to enable us to withstand any eventuality and properly plan for the future"*.

The opinions of the participants confirmed HADJIMANOLIS (2000) findings which state that the absence of innovative-related institutions and the provision of continuous training is the result of SMEs' failure to accept technologically integrated management. The claim of the participants that leadership required innovative skills is supported by RUBMANN et al. (2015) argument that emerging technologies are changing the requirements in the labour market, particularly in the competencies and abilities. All the participants said that SMEs require managers with business skills and innovative leadership to survive the current business landscape.

A participant mentioned: *"Most of these SME leaders may have the necessary skills for effective management but these skills might be obsolete"*.

4. MAIN CONCLUSION AND NOVEL FINDINGS OF THE DISSERTATION

The study fuses on how SME leadership competence development is integrated into the technology accepted model (TAM) to understand and predict technology acceptance behaviour among leaders, managers, SME owners and decision-makers. Technology and competencies integration as a requirement for SME growth and sustainability, the primary objective of this study is unique. The study builds empirical research to align SME leadership competence development with the technology acceptance model (TAM) to form the technology acceptance competence integration model (TACIM) for sustainable SMEs. The study reveals that an individual's perception of technology applications is enshrined in his or her ability and the state policy on the Internet of Things.

The study advocates compulsory and continuous training programmes such as marketing, investment and customer relations for SMEs emphasizing entrepreneurial skills training. SME leadership requires innovative leadership to withstand the changing skill requirement influenced by innovative technologies, because organizational sustainability largely depends on organizational efficiency, strategy decisions and flexibility of leadership approach. Hence, leaders' competencies development determines their interest and commitment to applying technology in daily business activities. However, SME are confronted with barriers include but are not limited to state policies on technology and access to credible information.

The findings advance theoretical understanding and provide practical guidance on developing skills and competencies for contemporary business operations in emerging markets. The study specifically discovered the following:

1. The study uncovers the precise magnitude and direction of the relationship between specific competency dimensions like interpersonal and key motivators such as perceived usefulness, and leadership support offering robust, across-contextual insights into their interactionist effects.

2. Findings reveal a balanced interactionist perspective that highlights the contextual and interdependent nature of leadership and technology in fostering sustainable organizational competencies.

3. The study reveals that insolvency is not merely the result of managerial ignorance, but more critically stems from the absence of scientific reasoning, structured decision-making processes, and the practical application of evidence-based management in business practices.

4. Additionally, it highlights the detrimental effects of neglecting organizational socialization mechanisms and ethical consciousness which together undermine sustainable business operations and long-term viability.

5. The research underscores that competencies and personal development serve as foundational elements for effective technology integration and the overall operational success of an organization, rather than being seen as costly luxuries or niche specializations.

4.1. Theoretical and Practical Implications

The study adds substantial knowledge to the social exchange theory by indicating the significance of social competencies in technology acceptance for organizational success. The results provide empirical evidence for resource-based theory, showing how leadership derives the development of management capabilities and functional competencies as a strategic organizational resource. The study advances human capital theory by elucidating the interconnected nature of technology and competencies that comprise individual and collective workforce capacity. The study found relationships among competencies aligned with emerging technologies emphasizing the role of leadership in identifying opportunities and reconfiguring organizational resources. The technology acceptance competence integration model (TACIM) was premeditated to evaluate competencies required for the adoption and utilization of technology applications within SMEs. This model combines aspects of TAM with the emerging competencies for effective implementation. The model emphasizes the integration of technology acceptance with competence development for a sustainable SME.

4.2. Practical Implications

The results could be used as a guide to policies aimed at supporting businesses in adopting new strategies for future workforce needs. The study encourages organizations to emphasize social competencies like communication, teamwork, and knowledge sharing to facilitate critical thinking and problem-solving. The results will enable leadership development to focus on building critical analysis and skills evaluation to derive management and functional competencies. With these results, hiring and training will take a holistic view of competencies as interconnected, not independent skill sets. Firms could audit competencies regularly to identify gaps and proactively build the human capital needed for digital transformation.

LIST OF PUBLICATION

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Subject: PhD Publication List

Candidate: Peter Akpamah
Doctoral School: Doctoral School of Management and Business
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List of publications related to the dissertation

Articles, studies (5)

1. **Akpamah, P.**, Matkó, A.: Assessing SMEs leadership styles impact on business development and job creation: Evidence from Ghana.
   Problems and Perspectives in Management. 21 (1), 448-458, 2023. ISSN: 1727-7051.
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2. **Akpamah, P.**, Matkó, A.: Information Technology deployment in Human Resource Management: a case study in deprived regions.
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List of other publications

Articles, studies (1)

6. **Akpamah, P.**, Ivan, S. E., Matkó, A.: Organizational Culture as a Strategy. *Cross Cultural Management Journal. 23* (1), 15-26, 2021. ISSN: 2286-0452.

The Candidate's publication data submitted to the iDEa Tudóstér have been validated by DEENK on the basis of the Journal Citation Report (Impact Factor) database.

13 December, 2024

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