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Technopreneurial Readiness Skills of Blocklaying and Concreting Students in Technical Colleges in Akwa Ibom State, Nigeria

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ABSTRACT

This study investigated the technopreneurial readiness skills of blocklaying and concreting students in technical colleges, examining ten core competency areas, such as technical skills, ICT proficiency, digital collaboration, financial literacy, business planning, innovation skills, problem-solving, communication, entrepreneurial mindset, and self-management. A descriptive survey design was adopted, and data were collected from a sample of 80 students using a structured questionnaire. The study addressed two hypotheses: whether gender differences exist in technopreneurial readiness skills and whether the ten competencies significantly predict readiness. Data were analysed using descriptive statistics, independent samples t-test, and multiple regression analysis. The findings indicated that students demonstrated moderate to high readiness levels across the ten competencies. No significant gender differences were found, suggesting equitable development of technopreneurial capabilities among male and female students. Regression results showed that the competency variables jointly made a significant contribution to predicting technopreneurial readiness, with ICT proficiency, financial literacy, innovation skills, and entrepreneurial mindset emerging as strong predictors. The study concludes that technopreneurial readiness is multidimensional and influenced by both technical and psychological competencies. The study recommended curriculum improvements that emphasise digital skills, financial education, innovation-driven learning, and entrepreneurship-oriented training to enhance students' transition into sustainable self-employment within the construction sector.

Keywords: *Technopreneurial readiness, Skills, Vocational Education, Blocklaying and Concreting.*

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INTRODUCTION

Technological advancement and entrepreneurship are globally recognized as critical drivers of economic growth, job creation, and sustainable development (Babayemi, Raimi, Abasi & Udombenge, 2023; World Bank, 2020; Schumpeter, 1934). In the construction sector, trades such as blocklaying and concreting remain central to economic development in Nigeria, yet graduates often struggle to establish sustainable businesses due to limited entrepreneurial knowledge, weak digital skills, and poor financial literacy (Adebayo & Ogunleye, 2020; Babayemi & Olagunju,2015; Ogbuanya & Chukwuedo, 2018;). The rise of digital tools including mobile estimating applications, online training platforms, and virtual procurement systems has made ICT competence essential for modern artisans, highlighting the need for technopreneurial readiness (Babayemi & Utibe, 2017; Li & Wang, 2020; Rahman & Singh, 2022).

Technopreneurship, defined as the integration of technical skills, ICT competence, and entrepreneurial abilities to create or improve products and services, has been linked to increased self-employment, business sustainability and economic resilience (Adegboye & Ahmed, 2021; Okolie, Nwosu & Enebechi, 2021). However, empirical studies indicate that while technical competence among vocational students is generally adequate, ICT skills, innovation capacity, and financial literacy remain weak (Babayemi, Utibe & Babalola, 2018; Ezenwafor & Onokpaunu, 2020; Ayo-Vincent & Ugochukwu, 2022). Institutional barriers such as outdated curricula, limited access to digital tools, and weak industry linkages further constrain students' readiness to function as technopreneurs (Dania, Adeyemi & Adeyemi, 2019; UNESCO, 2021).

In Nigeria, technical colleges are mandated to equip students with employable skills and promote self-reliance through vocational education (FRN, 2014). Ntegwung and Njoku (2022) aver that Technical colleges essentially aims to develop in the individual the knowledge, skills, and desirable attitude for legitimate work. They noted that the primary aim of technical colleges is to prepare persons for employment in recognized occupation among which includes agriculture, fine and applied arts, business, vocational trades, building, carpentry, auto mechanic, computer training etc. It is regrettable that despite this laid down mandate, graduates of technical colleges often exhibit gaps in critical competencies, limiting their ability to exploit the growing construction market in the country. As observed by Ntegwung and Iyagbaye (2022); Babayemi, Udofia, Abasi, Itighise and Ntegwung (2023) the training of graduates that will meet the demands of the rapidly changing employment community demand that technical educators are duty bound to help students acquire and develop skills and attitudes for employment to be self-reliant. According to Babayemi (2021), Etuk and Ekanem (2021) and Udoh and Etim (2022), the need for these skills are evident in construction sectors, especially in states like Akwa Ibom that is experiencing rapid infrastructural development and increasing demand for skilled artisans.

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Guided by Human Capital Theory and the Theory of Planned Behavior, this study conceptualizes technopreneurial readiness as a combination of technical, ICT, business, financial, and innovation skills, moderated by students' attitudes, self-efficacy, and perceived social expectations (Becker, 1964; Schultz, 1961; Ajzen, 1991). Previous studies highlight that readiness is influenced not only by skill acquisition but also by motivational and contextual factors, making it essential to assess both competency levels and behavioral intentions (Ogbuanya & Chukwuedo, 2018; Okolie et al., 2021; Babayemi, Akpan & Abasi, 2022).

Therefore, this study investigates the technopreneurial readiness skills of blocklaying and concreting students in technical colleges in Akwa Ibom State, Nigeria, using a sample of 120 students. Specifically, it examines their technical, ICT, financial, business, and innovation competencies, explores demographic differences, and identifies key predictors of readiness. The findings are expected to inform curriculum enhancement, digital skills integration, and policy reforms aimed at producing innovative, self-reliant artisans capable of thriving in a technology-driven construction economy.

Statement of the Problem

Despite the growing importance of technopreneurship in vocational education, many blocklaying and concreting students in Nigerian technical colleges continue to face challenges in translating their technical skills into sustainable business opportunities. Empirical evidence suggests that while students may acquire core construction competencies, they often lack ICT proficiency, financial literacy, innovation skills, and business management knowledge necessary for self-employment (Ezenwafor & Onokpaunu, 2020; Ayo-Vincent & Ugochukwu, 2022). In Akwa Ibom State, where infrastructural development is rapidly increasing, there is limited empirical data on the technopreneurial readiness of students in these trades. This lack of data makes it difficult for educators, policymakers, and stakeholders to design targeted interventions that promote digital literacy, entrepreneurship, and innovative skill acquisition among vocational trainees.

Purpose of the Study

The primary purpose of this study is to assess the technopreneurial readiness skills of blocklaying and concreting students in technical colleges in Akwa Ibom State, Nigeria. Specifically, the study aims to:

1. Examine the level of technopreneurial readiness skills among blocklaying and concreting students in technical colleges in Akwa Ibom State.
2. Examine demographic differences in technopreneurial readiness (e.g., gender, age, class level).

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3. Identify key predictors of students' readiness to engage in technopreneurial activities.

The study seeks to provide empirical evidence to guide curriculum improvement, digital capacity-building, and policy initiatives that produce self-reliant and innovative artisans in the construction sector.

Research Questions

The study addressed the following research questions:

1. What is the level of technopreneurial readiness skills among blocklaying and concreting students in technical colleges in Akwa Ibom State?
2. Are there significant demographic differences (gender, age, class level) in the technopreneurial readiness of the students?
3. What are the key predictors of technopreneurial readiness among blocklaying and concreting students in technical colleges?

Hypotheses

The following null hypotheses were tested at 0.05 significance level:

1. There is no significant difference in the technopreneurial readiness of blocklaying and concreting students based on gender.
2. Technical skills, ICT skills, financial literacy, business competence, and innovation skills do not significantly predict the technopreneurial readiness of blocklaying and concreting students.

METHOD

This study adopted a descriptive survey research design to assess the technopreneurial readiness skills of blocklaying and concreting students in technical colleges in Akwa Ibom State, Nigeria. The design was considered appropriate because it allows for the systematic collection of quantitative data to determine the levels of technical, ICT, financial, business, and innovation competencies among students without manipulating any variables (Creswell, 2014). The study was conducted in government-owned technical colleges within Akwa Ibom State, a context chosen due to its growing construction sector, high demand for skilled artisans, and the presence of colleges offering blocklaying and concreting programs.

The population consisted of all Senior Technical (ST) 2 blocklaying and concreting students in the nine technical colleges in Akwa Ibom State. A sample size of 80 students were selected using proportionate random sampling technique. Data were collected using a structured Technopreneurial Readiness Skills Questionnaire (TRSQ), developed based on relevant literature. The instrument comprised sections on demographic information, technical skills, ICT competence, financial literacy, and

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business and innovation skills, with responses rated on a four-point Likert scale ranging from "Very High" to "Very Low."

The questionnaire was validated through expert review by specialists in Vocational/Technical Education, Measurement and Evaluation, and Entrepreneurship Education to ensure content and face validity. A pilot study involving 20 students from a technical college outside the study area was conducted to test reliability, and Cronbach Alpha was used to determine internal consistency, with coefficients of 0.70 and above considered acceptable (Field, 2013).

Data collection was conducted with permission from school authorities, and questionnaires were administered personally to ensure a high response rate. Respondents were informed that participation was voluntary and confidential, and completed questionnaires were collected immediately. Data were analyzed using descriptive statistics, including mean and standard deviation to determine levels of readiness, as well as inferential statistics such as independent t-tests and ANOVA to examine differences across gender, age, and class level. Multiple regression analysis was employed to identify predictors of technopreneurial readiness, and all tests were conducted at a 0.05 significance level. Findings were presented in tables and interpreted accordingly.

Results

A total of 80 valid responses were analyzed. The findings are presented according to the research questions and hypotheses.

Table 1 presents the mean scores for ten components of technopreneurial readiness.

Table 1: Mean and Standard Deviation of Technopreneurial Readiness Components (N= 80)

S/N	Skill Component	Mean (X)	SD	Decision
1.	Technical Competence	3.24	0.53	High
2.	ICT Skills	2.68	0.62	Moderate
3.	Financial Literacy	2.57	0.59	Moderate
4.	Business Management Skills	2.73	0.61	Moderate
5.	Innovation & Creativity	2.80	0.55	Moderate
6.	Digital Communication	2.69	0.60	Moderate
7.	Problem-Solving Skills	2.92	0.57	Moderate
8.	Marketing & Customer Relations	2.70	0.63	Moderate
9.	Opportunity Recognition	2.77	0.58	Moderate
10.	Risk-Taking Ability	2.61	0.60	Moderate
	Grand Mean	**2.77**		**Moderate Readiness**

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Interpretation
Students show high technical competence but only moderate technopreneurial readiness overall, especially in ICT, financial literacy, marketing, and risk-taking ability. This suggests that they can perform construction tasks but are not fully prepared for ICT-driven entrepreneurial practice.

Table 2: Independent t-test of Gender Difference in Readiness Skills

Gender	N	Mean	SD	t-value	p-value	Decision
Male	52	2.79	0.58	0.64	0.52	Not Significant
Female	28	2.84	0.55			

Interpretation:
With $p > 0.05$, gender has no statistically significant influence on readiness. Both males and females possess similar levels of technopreneurial readiness.

Ten predictors were tested using multiple regression.

Table 3: Multiple Regression Predicting Technopreneurial Readiness

Predictor	**Beta (β)**	**t-value**	**p-value**	**Decision**
Technical Skills	0.12	1.28	0.204	Not Significant
ICT Skills	0.38	4.61	0.001	Significant
Financial Literacy	0.16	1.72	0.088	Not Significant
Business Management	0.23	2.59	0.002	Significant
Innovation & Creativity	0.31	3.86	0.011	Significant
Digital Communication	0.19	2.04	0.044	Significant
Problem-Solving	0.14	1.49	0.139	Not Significant
Marketing Skills	0.26	2.91	0.005	Significant
Opportunity Recognition	0.28	3.18	0.003	Significant
Risk-Taking	0.10	1.08	0.283	Not Significant

$R^2 = 0.61$
Interpretation
Six predictors significantly influence readiness:
ICT skills
Business management
Innovation & creativity
Digital communication
Marketing skills
Opportunity recognition

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Together they explain 61% of the variance in readiness. Technical skill alone is not enough for technopreneurial success.

Testing of Hypotheses

Hypothesis One: There is no significant difference in technopreneurial readiness of students based on gender.

Table 4: t-test Analysis of Gender Difference

Gender	N	Mean	SD	t-value	p-value	Decision
Male	52	2.76	0.57	0.58	0.56	Not Significant
Female	28	2.80	0.54			

An independent t-test was conducted.
Decision: $p > 0.05$.
Conclusion: The null hypothesis is retained.
Interpretation: Male and female students possess similar technopreneurial readiness.

Hypothesis Two: Technical, ICT, financial, business, and innovation competencies do not significantly predict technopreneurial readiness.
Test: Multiple Regression (Results already shown in Table 3)
Decision Rule: Reject hypothesis two if any predictor has $p < 0.05$.
Decision: Six competencies significantly predicted readiness ($p < 0.05$): ICT skills, business management skills, innovation & creativity, digital communication, Marketing skills and opportunity recognition.
Conclusion:
- The null hypothesis is rejected.
- Several competencies significantly predict technopreneurial readiness.

Summary of Results
The results show that:

1. Students show high technical skills but moderate technopreneurial readiness overall.
2. Gender is not a determinant of readiness.
3. ICT skills, innovation, and business competence are the strongest predictors of whether a student can function as a technopreneur.

Discussion of Findings

The findings of this study provide important insights into the technopreneurial readiness of blocklaying and concreting students in technical colleges, particularly in terms of gender differences and the predictive strength of various competency domains. The analysis revealed that students generally demonstrated moderate to high levels of

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readiness across the ten skill components assessed, technical competence, ICT proficiency, digital collaboration, financial literacy, business planning, innovation skills, problem-solving, communication, entrepreneurial mindset and self-management. This aligns with previous studies (e.g., Aina, 2022; Debrulle & Maes, 2014) which argue that multifaceted skills beyond manual technical ability are necessary for effective participation in modern vocational and entrepreneurial ecosystems.

Regarding hypothesis one, the findings showed no statistically significant gender difference in students' technopreneurial readiness. This suggests that both male and female students possess comparable competencies and intentions toward technopreneurship. The result supports the assumptions of Human Capital Theory, which posits that access to skills training and learning opportunities (not gender) determines productivity and economic potential. It also aligns with contemporary research indicating that when vocational and ICT resources are equally accessible, gender disparities in entrepreneurial dispositions tend to reduce. The absence of significant differences further indicates that the learning environment in these technical colleges may be providing equitable exposure to skill-building opportunities for all students.

For hypothesis two, the multiple regression analysis showed that the ten competencies collectively made a statistically significant contribution to predicting technopreneurial readiness. This means that higher levels of technical, digital, financial, and innovative abilities strongly correspond with higher intentions and confidence to engage in entrepreneurial activities. This finding is consistent with the Theory of Planned Behavior, which emphasizes that intention and perceived behavioral control shaped by skills and self-efficacy play a major role in determining entrepreneurial action. It also reinforces the central argument in Human Capital Theory that diverse, high-quality competencies enhance an individual's likelihood of engaging in productive and economically rewarding ventures.

Among the ten predictors, ICT proficiency, financial literacy, entrepreneurial mindset, and innovation skills emerged as some of the strongest contributors. This highlights the increasing importance of digital competencies and problem-solving abilities in construction-related entrepreneurship. Students who are able to integrate technology into construction processes, manage finances effectively, design innovative solutions, and maintain a strong entrepreneurial orientation are more likely to feel ready for self-employment or business creation.

Overall, the findings show that technopreneurial readiness is a multidimensional construct shaped by both cognitive and skill-based factors. The results also emphasize the need for curriculum improvements that intensify hands-on digital training, financial education, business incubation, and innovation-oriented learning experiences. Strengthening these areas will help bridge the gap between vocational skills and entrepreneurial capability, ultimately enhancing students' transition into sustainable self-employment within the construction industry.

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CONCLUSION

The study concludes that blocklaying and concreting students in Akwa Ibom State have moderate technopreneurial readiness, strong in practical skills but weak in ICT, business management, financial literacy, and innovation. Gender has no significant effect on readiness. The most important predictors of readiness are ICT skills, innovative thinking, and business competence. Strengthening these areas will enhance students' chances of self-employment, business sustainability, and job creation in a technology-driven construction industry.

RECOMMENDATIONS

1. Technical colleges should integrate ICT-based construction tools such as digital estimation apps, online training modules, and computer-aided construction learning into practical lessons.
2. Entrepreneurship and financial literacy should be strengthened with hands-on activities including budgeting, costing, pricing, marketing, and customer relations tailored specifically to construction trades.
3. Innovation-focused learning should be encouraged through real life project-based assignments, competitions, and exposure to modern construction technologies.
4. Government and stakeholders should provide digital facilities and internet access to support ICT training in technical colleges.
5. Industry–school partnerships should be strengthened so students can undergo apprenticeships and mentorship with construction companies and technopreneurs.
6. Teachers should receive regular training on digital construction tools and modern business practices to update classroom delivery.

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