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IMPACT OF FINANCIAL TECHNOLOGY (FINTECH) ON DIGITAL ENTREPRENEURSHIP GROWTH: EVIDENCE FROM SMES IN NORTH EAST NIGERIA

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Abstract

This study examines impact of financial technology (Fintech) on digital entrepreneurship and promoting digital business practices in North East Nigeria, a region marked by security and infrastructure as well as economic constraints. Using a mixed-methods approach, data were collected through surveys and semi-structured interviews from 722 business owners and Fintech users, a sample of 250 was determined using Krejcie and Morgan's table. The data collected were analyzed using correlation and thematic analysis, with in-depth analyses of case studies, policy frameworks, and market trends. Findings reveal that Fintech platforms such as mobile payment and online credit facilities significantly enhance digital entrepreneurship. However, challenges such as limited digital literacy, poor internet infrastructure most especially in the rural areas, and regulatory gaps hinder broader development. The study recommends targeted interventions to improve digital infrastructure and awareness, alongside regulatory frameworks to support Fintech-driven entrepreneurship development.

Keywords: Fintech, Entrepreneurship, Digital enterprise, Digital Finance, Digital literacy

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Introduction

The northeastern Nigeria, is marked by insurgency in Borno, Yobe, Gombe Bauchi and Adamawa, has slowed economic activity, and SMEs face greater exclusion from formal finance. However, emerging evidence highlights the role of fintech in catalyzing the growth of digital entrepreneurship. A 2018 EFInA survey (updated data persists until 2024) reveals 46% financial exclusion among 12.3 million adults in the region, with rates as high as 76% in Gombe and 61% in Bauchi, driven by rural residence (85% of the population) and low mobile phone ownership (56%) (Adebayo &Iweala, 2021).

However, fintech-driven mobile money shows promise: only 6% used electronic payments in 2018, but 39% expressed interest, surpassing southern areas. This interest translates into the growth of SMEs, as digital tools facilitate savings (40% of adults save, although mainly informally) and credit (44% apply for loans, but are shifting from households to apps). For digital entrepreneurs, platforms such as Jamborow (AI-powered inclusion) and HerLocal Market (e-commerce for women-led SMEs) have empowered rural traders, increasing market access by 30% to 50% in pilot areas (Buker, 2024).

Youth-led digital ventures in the fintech sector are booming, supported by programs such as the North-East Startup Training (NEST, launched in 2022), which accelerated three fintech/agritech startups out of 8,500 applicants, focusing on training for digital scaling. The Northern Network of Incubators and Accelerators (NNIA) facilitate fintech hubs, with examples such as Hello Tractor, which uses SMS/mobile payments for agricultural mechanization, directly assisting entrepreneurial SMEs in Adamawa and Gombe. Quantitatively, the region hosts between 4% and 6% of domestic startups (e.g., 5.7% in Adamawa), but fintech integration has raised $11 million for 13 AI-focused companies by 2024, many of them targeting SME lending. Agritech-fintech models, such as ColdHubs with digital payments for solar storage, have boosted SME efficiency in trading perishable goods, creating jobs in Yobe and Taraba (Karim et al, (2022). .

In broader African contexts, including Nigeria, fintech developments heterogeneously boost digital finance for SMEs by between 20% and 35%, with entrepreneurship rates increasing by 15% in high adoption areas. In the Northeast, anecdotal evidence from NITDA's 3 Million Technical Talent program shows that 20% of participants launch digital SMEs in fintech-enabled sectors such as edtech and logistics, with 25% revenue growth attributed to low-cost digital tools. Creation of enterprises that focused on renewable energy, sustainable agriculture, and waste management that will promote economic resilience has become imperative. SMEs in North East Nigeria ravaged by socioeconomic challenges, poor financial inclusion and post insurgency recovery needs. These challenges emphasize the need for fintech to sustain digital entrepreneurship that foster economic resilience while addressing ecological degradation. Financial technology (Fintech) has

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emerged as a transformative tool globally, offering innovative solutions for financial inclusion, access to capital, and efficient transactions for entrepreneurs.

Fintech refers to technology-enabled financial services, including mobile banking, crowdfunding, and blockchain-based transactions. Globally, Fintech has revolutionized access to finance for small and medium enterprises (SMEs), with studies showing its role in reducing transaction costs and improving financial inclusion (Arner et al., 2020). In the context of entrepreneurship development, Fintech facilitates sustainable finance through mechanisms like g bonds, peer-to-peer lending for renewable energy projects, and digital platforms for carbon credit trading (Puschmann et al., 2020).

In Sub-Saharan Africa, Fintech adoption has grown rapidly, with Nigeria leading in mobile money usage and digital payments (McKinsey, 2020). However, North East Nigeria lags due to conflict-induced disruptions, low digital literacy, and poor internet penetration. Creation of new business emprises in areas, such as renewable energy adoption and waste recycling, require significant upfront capital, which traditional financial institutions often fail to provide due to perceived risks and lack of collateral among entrepreneurs (Adebayo & Iweala, 2021). Fintech offers a potential solution by enabling alternative financing models, but its efficacy in conflict-affected regions like North East Nigeria is understudied

However, its impact in North East Nigeria remains underexplored due to unique security, socio-economic and infrastructural constraints. This study investigates the role of Fintech in promoting digital entrepreneurship, particularly among women and youth entrepreneurs in North East Nigeria, aiming to identify opportunities and barriers for leveraging Fintech in this region.

This study seeks to answer the following research questions:

a) To what extent does Fintech financing influence digital entrepreneurship growth in North East Nigeria?
b) How does Fintech facilitate the adoption of sustainable digital business practices among entrepreneurs North East Nigeria?

Literature Review

The term "Fintech," which stands for "financial technology," describes how IT is used in the financial sector. It includes blockchain technology; artificial intelligence (AI), crowdfunding, digital banking, and so on that seek to facilitate financial services transfer through increased inventiveness, accessibility, and efficiency (Moor&Lim, 2022). In the financial industry, information solutions have significantly changed the way financial services are delivered. The first instance of this phenomenon is the rise of Fintech, a technological innovation that disrupts the traditional financial services paradigm. Fintech

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is bringing creative ideas that render financial organizations less costly and user-friendly, thereby altering the way they provide goods and services (Lam &Law, 2016). With the introduction of Fintech, the financial sector is undergoing radical transformations in the current, technologically advanced era. Both significant possibilities and new difficulties are brought about by this shift for consumers, the financial sector, and governments (Addy et al, 2024). Industrial revolutions are caused by digital innovation from the standpoint of business models. The transition to technology and digital applications has caused organizations' strategic priorities to change, with the ultimate objective being to satisfy client needs.

Fintech is primarily divided into six categories: capital, lending, payments, wealth management, crowdfunding, and insurance services (Addy et al, 2024). The approaches by which Fintech institutions operate are as follows (Cen& He, 2023; Hussain et al., 2023) the utilization of cutting-edge technologies, particularly mobile phones, a computer, or a digital tablet linked to the Internet or any other communication network in order to provide the final user with goods and services that are more abundant and/or more reasonably priced than those provided by other operators. Customer behavior evolution (connected smart phones, social network geotagging) and establishing a suitable legal and regulatory framework: Building strong relationships and partnerships with banks; fresh developments in the banking and financial services industries.

Fintech's sophisticated data processing technologies improve overall financial system efficiency by facilitating better capital allocation. Fintech refers to a wide range of financial technologies that use advances in digital technology to revolutionize traditional financial services and transactions. Fintech helps cities implement data-driven strategies, allocate resources optimally, and provide residents with the necessary tools to successfully engage in entrepreneurship (Udeagha & Muchapondwa, 2023).If Fintech is well-established, it can serve as a catalyst for cooperative innovation among traditional banking and financial institutions. Entrepreneurs may establish long-term growth using a common foundation provided by Fintech. Fintech is not without flaws, though; there are certain possible drawbacks and even risks associated with it. Due to their reliance on standardized questionnaires, Fintech solutions like robo-advisor cannot offer more individualized goods and can only supply a restricted amount of consumer preference information (King & Nesbitt, 2020).

Compared to traditional investments, there is a higher chance of fraud since there is less due diligence and information that cannot. Conversely, blockchain's complexity makes it difficult for it to be widely adopted and necessitates certain degree of user ability and experience. Furthermore, this technology uses a great deal of energy and has a somewhat slow transaction speed (Al-matari et al2022). Without altering the key financial functions

of risk diversification, capital financing, and payment clearing, it only entails technological advancements in transaction channels and techniques. The primary distinction between it and traditional finance is whether or not financial services for the general public are offered through network channels and digital technologies like big data, cloud computing, blockchain, and AI. According to the research (Al-matari et al 2022), digital finance fosters innovation in entrepreneurship more successfully and inclusively than traditional finance in places where the latter is less advanced. Traditional finance offers financial services to entrepreneurs via physical sales channels, making overcoming regional and spatial barriers challenging. Digital finance uses a mobile payment platform to move financial services from offline to online. This eliminates financial services' geographic and spatial constraints, enables them to reach underdeveloped areas effectively, broadens the scope of financial services, and increases the size of social financing (Moreira-Santos, Au-Yong-Oliveira, &Palma-Moreira, 2022).

Digital entrepreneurship is to transform the current business into new technology creating a new venture with the usages of new technology. For economic growth, Job generating and modernization; digital entrepreneurship has continue to emerge as a serious pillar for economic development. Digital entrepreneurship refers to the creation of novel business ventures by with the aid digital technologies. It involves using digital tools, such as mobile application cloud computing, social media, online platforms, internet and data driven innovations to identify opportunities, design products or services, which deliver value and satisfy customers' needs.

Nambisan (2017), assert that digital entrepreneurship is the pursuit of new business opportunities by creatively using digital technologies. Hull et al. (2007) describe it as the use of information and communication technologies in entrepreneurial processes to create value and transform markets that satisfy customer needs. Le Dinh et al. (2018) further explain that digital entrepreneurship represents a paradigm shift in entrepreneurship shaped by digital infrastructure, online platforms, and digital ecosystems

Methodology

This study adopts a mixed-methods approach to examine Fintech's impact on digital entrepreneurship growth and sustainable digital business practices in North East Nigeria. A cross-sectional survey was conducted alongside semi-structured interviews to gather quantitative and qualitative data. The survey targeted entrepreneurs and Fintech users, while interviews provided deeper insights into their experiences and challenges. Thematic analysis was employed to identify patterns or themes within qualitative data, the goal of

a thematic analysis is to identify themes, i.e. patterns in the data that are important or interesting, and use these themes to address the research questions.

The study population comprised entrepreneurs (e.g., renewable energy in agriculture, organic farming enterprises) and Fintech users in North East Nigeria. A convenient sampling technique was used to select 722 respondents across Bauchi, Gombe, and Yobe states; a sample of 250 was determined using Krejcie and Morgan's table. A structured questionnaire was used to collect data. The data collected were analyzed using regression analysis to impact of Fintech on growth of digital entrepreneurship and sustainable digital business practice. Also data from interviews were analyzed thematically to identify recurring patterns and challenges.

Regression Analyses

Table 1: Regression Test Results – Fintech against digital entrepreneurship

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.739[a]	.546	.541	.43037

a. Predictors: (Constant), Fintech

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
Regression		20.065	1	20.065	108.334	.000[b]
1		16.669	90	.185		
Residual Total		36.735	91			

a. Dependent Variable: digital entrepreneurship

b. Predictors: (Constant), Fintech

Coefficients[a]

Model	Unstandardized Coefficients		Standardize d Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant) 1	1.266	.169		7.482	.000
Fintech	.625	.060	.739	10.408	.000

a. Dependent Variable: digital entrepreneurship

The results on impact of Fintech on growth of digital entrepreneurship indicate that Fintech has significant influence on growth of digital entrepreneurship. Results indicate sig. 0.000 <0.05, implying a significant impact of Fintech on digital entrepreneurship

growth the r^2= 0.546 means Fintech contribute 54.6% on growth of digital entrepreneurship in northeast Nigeria.

Table 2: Regression Test Results - Fintech against sustainable digital business practice

Model of Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.759[a]	.577	.572	.41924

a. Predictors: (Constant), sustainable digital business practice

ANOVA[a]

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	21.079	1	21.079	119.932	.000[b]
1	15.467	88	.176		
Residual Total	36.546	89			

a. Dependent Variable: sustainable digital business practice

b. Predictors: (Constant), Fintech

Coefficients[a]

Model	Unstandardized Coefficients		Standardize d Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.171	.169		6.926	.000
1 Fintech	.674	.062	.759	10.951	.000

a. Dependent Variable: sustainable digital business practice

The second objective intended to determine influence of Fintech on sustainable digital business practice. The results indicate that Fintech has significant impact on sustainable digital business practice. The sig. 0.000<0.05, confirms the results.

Thematic Analysis

This study examine impact of Fintech on growth of digital entrepreneurship and sustainable digital business practices in North East Nigeria, the thematic analysis was be based on a broader understanding of Fintech trends, digital entrepreneurship, within the North East Nigeria context, reflect the potential dynamics in this specific region, considering its socio-economic, environmental, and technological landscape. The analysis identified major themes, drawing conjecture and logical extrapolations, while acknowledging gaps where empirical studies are unavailable.

Theme one: Access to Capital for digital entrepreneurship growth

Fintech platforms, such as mobile banking and crowdfunding, have potentially to augment access to finance for the growth of digital entrepreneurship in Northeast Nigeria, a region where traditional banking infrastructure had been limited due to insecurity, underdevelopment, and low financial inclusion most especially at the rural areas. Enterprises that focused on renewable energy, sustainable agriculture, or waste management requires capital for startup, digitalization and continues operation, which is challenging through conventional means. Fintech platform such as peer-to-peer lending and digital microfinance can bridge this gap by connecting entrepreneurs with investors and digital platforms even in rural areas. However, challenges such as low digital literacy, limited internet cost and penetration, as well as high interest rate due mistrust of online platforms had obstruct adoption of Fintech platforms among digital entrepreneurs.

Findings:

- Fintech platforms such as mobile money, online microfinance lending, and crowdfunding, have improved financial inclusion, particularly in rural areas where commercial banking services are limited which has resulted to growth in digital entrepreneurship in Northeast Nigeria. .
- Peer-to-peer (P2P) lending platforms and online credit services provide alternative financing options for funding digital entrepreneurship, bypassing the bureaucratic hurdles of commercial banks and other specialized banks.
- Nonetheless, low internet penetration due to poor mobile network coverage and digital literacy remain significant obstacle to adoption Fintech for financing the growth of digital entrepreneurship in North East Nigeria.

Supporting Studies:

- Kumer et al. (2023), Hidayat & Hussain (2024) found that Fintech significantly improves financial access in areas with limited access to commercial banking services, a key factor in sustaining digital entrepreneurship growth.
- Addy et al (2020), Welker et al, (2023) noted that mobile money and online credit lenders acceptance in Nigeria is growing, but rural entrepreneurs need more awareness and digital skills training.

Theme Two: Role of Fintech in Promoting Sustainable digital Business Practices

Fintech platforms can integrate features that enhance sustainable digital business practices, such as sustainable data platform that improve operational efficiency and optimizing resources utilization through energy efficient technology and cloud solutions

that integrate environmental conservation and social responsibility. In North East Nigeria, where environmental degradation (e.g., desertification and deforestation) is a pressing issue, Fintech could support businesses to adopt sustainable digital practices such as use of solar for energy generation. However, the lack of awareness and digital infrastructures in the region, have limit the impact of such tools on local businesses.

Findings:

- Entrepreneurs that access Fintech driven financing are more likely to adopt sustainable digital business practices, including renewable energy, waste management, and operational optimization strategies.
- Green credit scoring models can be used through integrating environmental, social, and digital factors to assess creditworthiness of entrepreneurs.
- However, a lack of government-backed incentives, limits widespread acceptance.

Supporting Studies:

- Tanchangya et al. (2022), Xu et al (2020) and Bollaert et al (2021) found that digital financing platforms have contributed to increased adoption of digital solutions in business operation among sub-Saharan countries.
- Testa et al. (2022), Vema et al (2023), Karim et al (2022) and Kashif et al (2024) suggested that blockchain-enabled supply chains could improve transparency in businesses practices.

Discussion

The regression analysis results indicate a significant positive relationship between Fintech and growth of digital entrepreneurship in Northeast Nigeria. The model summary shows an R-squared (R^2) value of 0.546, meaning that Fintech explains approximately 54.6% of the variance in digital entrepreneurship. This suggests that Fintech plays a crucial role in facilitating growth of digital entrepreneurship. The ANOVA results further confirm the statistical significance of the model, with an F-value of 108.334 and a p-value of 0.000 ($p < 0.05$), reinforcing the reliability of the findings. Additionally, the coefficient table demonstrates that Fintech has a significant positive effect on growth of digital entrepreneurship ($B = 0.625$, $t = 10.408$, $p = 0.000$). These findings highlight that as Fintech adoption increases; there is a corresponding increase in growth of digital entrepreneurship. This aligns with existing literature, which suggests that Fintech innovations such as blockchain, digital lending, and sustainable investment platforms enhance access to capital for digital entrepreneurship development. The results imply

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that policymakers and financial institutions should continue to support the integration of Fintech solutions to drive digital entrepreneurship.

The regression analysis examining the impact of Fintech on sustainable digital business practices similarly reveals a significant positive relationship. The R-squared (R^2) value of 0.577 suggests that Fintech accounts for 57.7% increase in sustainable digital business practices. This finding indicates that Fintech adoption significantly influences businesses' ability to implement sustainable digital practices. The ANOVA results demonstrate strong statistical significance, with an F-value of 119.932 and a p-value of 0.000, confirming the robustness of the model. Furthermore, the coefficient table shows that Fintech has a positive and statistically significant impact on sustainable digital business practices (B = 0.674, t = 10.951, p = 0.000). These results suggest that the integration of Fintech solutions enhances businesses' digital capacity to implement sustainable strategies, including digital payments that reduce paper usage, AI-driven resource optimization, and increased transparency and operational efficiency. The findings reinforce the growing role of Fintech in promoting digital sustainability of businesses with innovative financial tools to optimize operations and adhere to environmental, social, and digital (ESD) principles.

The findings highlight that fintech platforms have significantly improved digital entrepreneurship, especially in rural areas of North East Nigeria where digital financing mechanisms such as mobile banking, online microfinance, and crowdfunding have facilitated access to capital for entrepreneurs engaged in renewable energy, sustainable agriculture, and waste management. Nonetheless, the study also identifies major setbacks, including the insecurity in the region, which has led to the destruction of technological infrastructure, making fintech adoption less feasible. Moreover, regulatory uncertainty concerning fintech-based financing has discouraged potential investors from fully engaging in these alternative financing models.

Conclusion

This study demonstrates that Fintech is having a transformative impact on the growth of digital SME entrepreneurship in Northeast Nigeria, primarily through the democratization of finance and the enabling of scalable e-business models, evidenced by the growing adoption of this technology, job creation, and ecosystem programs such as NEST and NNIA. However, growth is uneven, with national trends outpacing regional realities due to structural challenges. To leverage these impacts, stakeholders should prioritize infrastructure investments (such as the Rural Broadband Co-Financing Fund); targeted literacy through the Tech Herfrica platform; low-risk financing through blended finance; and harmonization of policies related to intellectual property and regulations. With Nigeria's fintech sector projected to grow by 70% by 2024, a deliberate focus on the

Northeast could unlock $5–10 billion in SME value, fostering resilient digital economies. Fintech plays a pivotal role in the development of digital entrepreneurship and promoting sustainable digital business practices in North East Nigeria by improving access to capital, digital platforms and reducing transaction costs.

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