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EFFECT OF DIGITAL BANKING ON FINANCIAL INCLUSION OF STUDENTS IN KADUNA STATE UNIVERSITY, KADUNA-NIGERIA

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Abstract

The growing need to understand how digital financial services affect the financial participation of youths has been on an increase. This study examines the effect of digital banking (proxy by mobile banking, ATM, POS, Internet banking and Digital Payment Platform) on the financial inclusion of Students in Kaduna State University, Nigeria. This study is a response to the growing needs to comprehend the influence of digital Banking on the financial participation of youths in a developing country like Nigeria. Quantitative research design was used where data was collected from 497 students and analyzed using PLS-SEM. The findings shows that Mobile Banking, Internet banking, POS, and Digital Payment Platforms all have a significant relationship to financial inclusion. However, ATM was found to be insignificant. With an R2 of 0.285, the model is said to have a moderate variance in financial inclusion. This study recommends that more strategies for mobile banking, POS, internet infrastructures and digital banking platforms should be made more available within the university.

Keywords: Digital Banking, Financial inclusion, ATM, POS, Mobile Banking, Internet Banking and digital payment Platforms

Introduction

Financial inclusion has emerged as a critical policy objective for developing economies due to its capacity to reduce poverty, promote economic growth, and enhance social welfare. Financial inclusion refers to the availability, accessibility, and use of affordable and quality financial products and services by individuals and businesses (World Bank, 2022). It encompasses access to essential financial services such as savings, payments, credit, and insurance, particularly for underserved and vulnerable populations. An inclusive financial system contributes to economic development by enabling individuals to save, invest, manage risks, and participate effectively in economic activities.

Despite significant efforts to deepen financial inclusion globally, millions of adults remain excluded from the formal financial system. According to the World Bank Global Findex Report (2021), approximately 24% of adults worldwide remain unbanked, with the majority residing in developing countries. In Nigeria, although substantial progress has been recorded in expanding financial services through digital technologies, financial exclusion remains a persistent challenge. The Enhancing Financial Innovation and Access (EFInA) Access to Financial Services Survey revealed that approximately 26% of Nigerian adults remained financially excluded in 2023. The challenge is particularly pronounced among young adults, low-income earners, women, and rural populations, who often encounter barriers to accessing and utilizing formal financial services.

The rapid advancement of information and communication technologies has transformed the financial services landscape, giving rise to digital banking as a major instrument for promoting financial inclusion. Digital banking encompasses a range of electronic financial service channels, including mobile banking, automated teller machine (ATM) services, point-of-sale (POS) transactions, internet banking, and digital payment platforms. These technologies have revolutionized financial service delivery by reducing geographical barriers, lowering transaction costs, and improving convenience for users (Ozili, 2018). Through digital banking, individuals can perform financial transactions anytime and anywhere, thereby expanding access to formal financial services and fostering financial inclusion.

The relationship between digital banking and financial inclusion can be explained through the Technology Acceptance Model (TAM) developed by Fred Davis and the Unified Theory of Acceptance and Use of Technology (UTAUT) proposed by Viswanath Venkatesh and colleagues. These theories suggest that individuals are more likely to adopt and use technological innovations when they perceive them as useful, easy to use, and capable of enhancing their performance. Applied to digital banking, these theories imply that the extent to which users perceive digital banking channels as accessible, reliable, secure, and beneficial influences their adoption and utilization of financial services. Consequently, digital banking channels can serve as important mechanisms through which financial inclusion is enhanced.

Among various population groups, university students constitute an important segment for examining digital banking and financial inclusion. Students are generally characterized by high levels of technological exposure, internet usage, and digital literacy, making them early adopters of technological innovations (Abdulle, 2025). As digital natives, they frequently rely on electronic platforms for communication, commerce, and financial transactions. Nevertheless, differences in technological readiness, trust, financial literacy, and access to digital infrastructure may influence how effectively they utilize digital banking services (Awa, Ojiabo, & Orokor, 2017). Consequently, the widespread availability of digital banking services does not necessarily guarantee meaningful financial inclusion among students.

In developing economies such as Nigeria, digital banking presents an opportunity to overcome traditional barriers associated with conventional banking systems, including long distances to financial institutions, high transaction costs, and prolonged waiting times (Bukar et al., 2024). Recognizing these benefits, the Central Bank of Nigeria (CBN) has implemented several initiatives, including the cashless policy, mobile money regulations, payment system reforms, and electronic banking frameworks aimed at expanding access to financial services and reducing financial exclusion (Bamanga, 2025).

Kaduna State University (KASU) just similar to other tertiary institutions in Nigeria hosts a large population of students who are of varying ages and are expected to benefit significantly from these digital financial innovations. Students routinely engage in financial activities such as payment of tuition fees, transfers, purchases, savings, and online transactions, making digital banking an integral part of their daily lives. However, evidence suggests that many students continue to underutilize formal financial services or encounter challenges in effectively utilizing available digital banking channels (Ojo, 2021). This situation raises concerns regarding the extent to which digital banking services contribute to meaningful financial inclusion among students.

Despite the rapid growth of digital banking services in Nigeria, financial exclusion remains prevalent among young adults, including university students (Bamanga, 2025). Although mobile banking, ATM services, internet banking, POS terminals, and digital payment platforms have increased the availability of financial services, access alone does not necessarily translate into effective financial inclusion (Ozili, 2020). Challenges such as poor network connectivity, cybersecurity concerns, inadequate digital literacy, transaction failures, ATM downtime, and service reliability issues continue to limit the adoption and effective use of digital financial services (Ojo, 2021).

Furthermore, a review of existing literature reveals several important research gaps. First, a population gap exists because most studies on digital banking and financial inclusion focus on the general population, households, or small and medium-sized enterprises (SMEs), while university students receive relatively limited scholarly attention (Widyastuti et al., 2024; Umoren & Olaleye, 2025; Raji et al., 2021; Ismat et al., 2023). Second, a conceptual gap exists because some studies (Bazza et al, 2023; Bukar et al 2024; Ingale 2024; Triyanti et al 2024) treat digital banking as a single construct rather than examining its individual components, including mobile banking, ATM services, POS services, internet banking, and digital payment platforms. Such an approach overlooks the possibility that each channel may exert different effects on financial inclusion outcomes. Finally, an empirical gap exists because limited studies have simultaneously investigated the individual contributions of multiple digital banking channels to financial inclusion within a student population.

Given these gaps, there is a need for a more comprehensive examination of how specific digital banking channels influence financial inclusion among university students. This study therefore investigates the effects of mobile banking, ATM services, POS services, internet banking, and digital payment platforms on financial inclusion among students of Kaduna State University. By disaggregating digital banking into its key components, the study provides a more nuanced understanding of the mechanisms through which digital financial services promote financial inclusion. Therefore, based on the above arguments, the following null hypotheses have been formulated as follow:

Ho_1: Mobile banking has no significant positive effect on the financial inclusion of students in Kaduna State University

Ho_2: ATM services have no significant positive effect on the financial inclusion of students in Kaduna State University

Ho_3: POS usage has no significant positive effect on the financial inclusion of students in Kaduna State University.

Ho_4: Internet banking has no significant positive effect on the financial inclusion of students in Kaduna State University

Ho_5: Digital payment platforms have no significant positive effect on the financial inclusion of students in Kaduna State University

The study contributes to the existing literature in several ways. First, it extends the financial inclusion literature by focusing on university students, an important but under-researched demographic group. Second, it provides empirical evidence on the differential effects of various digital banking channels on financial inclusion. Third, it contributes to policy discussions on youth financial inclusion by providing insights that may assist financial institutions, regulators, and educational institutions in designing targeted interventions aimed at enhancing students' access to and usage of formal financial services.

The remainder of this paper presents the theoretical and empirical literature review, followed by the methodology adopted for the study. Subsequently, the results and discussion of findings are presented, while the final section concludes the study and offers policy recommendations.

2. Literature Review

This section covers the review of related literatures on Digital banking and Financial Inclusion

2.1.1 Conceptual Review

Digital banking refers to the provision of banking products and services through electronic and digital channels such as mobile phones, the internet, automated teller machines, point-of-sale terminals, and digital payment systems (Rakocevic et al., 2023). These platforms allows people assess their bank accounts without necessarily going into the banking halls therefore eliminating traditional banking methods, and enabling customers, especially students, to conduct financial transactions conveniently and at lower costs. (Ozili, 2018; Lolemo & Pandya (2024)).

According to Triyanti (2024) Mobile banking is one of the most widely adopted digital channels in developing economies. It enables users to check balances, transfer funds, and make payments using mobile phones. Mobile banking also offers the convenience of eliminating the need to remember SMS formats and target numbers (Mastuti & Indriyani, 2021).

ATMs provide cash withdrawal, balance inquiry, funds transfer, and utility payment services. They serve as an important self-service banking channel, bridging formal financial institutions and customers (Ehiedu, 2021). POS terminals are devices that allow for the electronic transfer of money between customers and businesses, enabling cashless transactions. These devices are a crucial component of Nigeria's cashless banking initiatives, designed to reduce the dependency on cash, improve transaction efficiency, and extend financial services to underserved populations (Adeolu et al, 2024). In recent years, POS terminals have become increasingly popular in Nigeria, especially with the rise of mobile money and agent banking models. By facilitating payments in remote areas and supporting microtransactions, POS terminals help individuals without access to traditional bank branches to engage in formal financial activities.

Internet Banking (IB) is an umbrella term for all those banking activities performed by customers either electronically or online without going through the hassle of reaching out to brick and-mortar banks (Bukar et al 2024). It encompasses the delivery of banking services via different channels such as the Internet, managed networks, personal computers, etc. In addition, it allows the use of the Internet and the Worldwide Web to allow customers to carry out financial activities in a virtual space. It extends traditional banking services by making banking services available at any time, providing ease of access, removing the inconvenience of queues, banking hours, reducing operating costs to banks (Inder et al., 2022). It provides broad features including fund transfers, account management, bill payments, and credit applications. Digital payment platforms include fintech wallets, QR-code payments, mobile money, and electronic transfer systems. Examples in Nigeria include Opay, Paga, Moniepoint, Remita, and Flutterwave. These systems accelerate financial integration by enhancing transaction speed, reducing costs, and increasing accessibility (Adesina & Ayo, 2019).

Financial inclusion refers to the availability, accessibility, and usage of formal financial services such as savings, payments, credit, insurance, and investment (Ashish, 2024). Financial inclusion refers to the accessibility and availability of financial services to all individuals, regardless of their income, social status, or geographic location. It aims to provide affordable and accessible financial services such as savings accounts, credit, insurance, and payment services to the unbanked population (Abdulle, et al, 2025). In Nigeria, financial inclusion remains a

priority area for both the government and financial institutions, as it is linked to reducing poverty, promoting entrepreneurship, and stimulating economic growth. Among youths and students, inclusion is strongly linked to digital penetration, digital literacy, and mobile-money adoption (Demirgüç-Kunt et al., 2018).

2.1.2 Empirical Review

Several studies have been conducted to assess the relationship between digital banking and financial inclusion using different methods. These studies have presented mixed results. For example, Mago and Chitokwindo (2014) examined the impact of electronic banking on financial inclusion in Zimbabwe, with a focus on mobile banking in the Masvingo province. The research adopted a qualitative research methodology and a survey design. They argued that electronic banking significantly impacts financial inclusion in Zimbabwe. Their results show that low income people are willing to adopt mobile banking, thereby enhancing financial inclusion. The reason they argued in this line is that mobile banking is easily accessible, convenient, cheaper, easy to use and secure. The study focused on just Mobile banking and adopted qualitative research methodology which limits the generalization of the findings and doesn't show the extent of the relationship that exists between Digital Banking and Financial Inclusion.

Bansal (2014) adopted qualitative research method to study the role of technology in achieving financial inclusion in rural India. The paper attempted to examine the contributions of information and communication technology towards achieving financial inclusion and reducing financial exclusion in the country and analyzed different application of information and communication technology which banks are adopting. The study posit that this would directly or indirectly reflect the effectiveness of the financial institution's efforts to bring-in underprivileged people to the mainstream financial system, especially in rural area support in achieving inclusive growth. The study concluded that modern information and communication technology can act as a tool to develop a platform which helps to extend financial services to remote areas. The study specifically identifies mobile banking and automated teller machines as two promising options for achieving financial inclusion. Thus, the technology of mobile banking and automated teller machines are adding new avenues in providing banking services to the unbanked population who are financially excluded. However, the study is qualitative and relied on previous empirical findings and conclusions which makes it prone to bias and subjectivity.

Ene et al (2019) examined the impact of electronic banking on financial inclusion in Nigeria. The study used the total number of automated teller machines and point-of-sale devices in Nigeria as proxies for electronic banking and the proportion of banked adult population to total bankable adult population in Nigeria as proxy for financial inclusion. The study adopted correlational and ex-post facto research designs with the aid of computer-based multiple regression analysis. It was observed that automated teller machines do not significantly impact financial inclusion while point-of-sale devices significantly impact financial inclusion in Nigeria.

Revankar et al (2023) carried out a research to determine the benefits of digital banking services in order to understand how effective digital banking is for financial inclusion. The study focused on four locations, and included demographics, variables for digital banking, and user obstacles. Data was collected using cluster sampling, analyzed using factor analysis while chi-square test and correspondence analysis was done using SPSS software. The study found that the current state of financial inclusion in India is largely influenced by digital banking, with its popularity growing due to ease of transactions, flexibility, and enhanced security measures. However, demographic parameters significantly impact digital financial inclusion. Millennials are less reliant on digital banking than Generation Z. Digital banking is determined by individuals earnings, with postgraduates and educated individuals using it daily. Challenges to digital financial inclusion include trust issues, limited financial literacy, and internet access.

Bazza et al (2023) examined the effect of POS on financial inclusion in Maiduguri, Nigeria. The population of the study were 533, 418 bank customers and using Yamani formular, a sample size of 400 was arrived at. Convenient sampling was adopted as the method of sampling technique and multiple linear regression was used to analyse the data via SPSS. The findings of the study revealed that the presence of POS has significantly improved the availability and affordability of financial service in the city of Maiduguri.

Bukar et al (2024) investigated the factors influencing the adoption of internet banking among students at the National Open University of Nigeria, Maiduguri Study Centre, employing the Unified Theory of Acceptance and Use of Technology (UTAUT) Model. The study adopted survey design, with a population of 944 registered students, a sample size of 282 gotten by using the Yamani formula, and simple random sampling was employed to select participants. The data was analyzed using both descriptive and inferential statistics techniques via Statistical Package for Social Science (SPSS). Findings from the study revealed that users believe that internet banking enhances their financial management effectiveness and efficiency. They find internet banking to be easy

to use and Users feel influenced by important individuals, friends or family to use internet banking services. They also believe they have the necessary resources and skills for effective internet banking. The study recommends financial institutions to provide user friendly guides, customer support, and tools to enhance facilitating conditions and remove any barriers to usage. Internet banking adoption remains low in Nigeria due to digital literacy, security concerns, and network issues.

Ingale (2024) investigated the role of mobile banking as a catalyst for expanding access to financial services and promoting inclusive growth with indicators of financial inclusion proxied by account ownership, savings mobilization, and access to credit. The study was conducted through a comprehensive examination of existing literature and empirical studies. The conclusion of the study was that Mobile banking offers a scalable and cost-effective solution to reach unbanked and underserved populations by taking advantage of the extensive use of mobile phones and digital technologies in emerging markets. Among university students, mobile banking usage is driven by smartphone availability, network reliability, and perceived usefulness as seen in the study conducted by (Okoye & Eze, 2021) on the adoption and acceptance of smart technologies of young adults.

Ocansey and Ackom (2025) assessed the impact of digital payment systems on financial literacy and financial inclusion. The study explored how macroeconomic and technological factors, such as inflation, education, and internet penetration, moderate these relationships across 35 Sub-Saharan African countries. The study employed a quantitative research approach using a panel data of 35 out of 49 Sub-Saharan countries based consistency of annual data, spanning from 2000 to 2023. The study utilized a two-step System Generalized Method of Moments estimation technique which addressed potential endogeneity, autocorrelation, and omitted variable bias while accounting for country-level heterogeneity. The Results of the study revealed that digital payment systems have a negative effect on financial inclusion. Education and internet penetration showed marginal positive influences, though weak. The study concluded that digital tools alone are insufficient for enhancing financial inclusion but should be complimented with education, trust-building, and infrastructure development.

Sukumaran (2025) examined the role of mobile banking on financial incusion in Kenya. The study conducted an empirical review and concluded that mobile banking has a significant impact on financial inclusion. It further asserted that mobile banking offers transformative potential not merely as technological advancement but as practical means to democratize financial services, create economic opportunities and enhance quality of life for previously excluded populations. This finding corresponds to the findings of Triyanti et al (2024) which assessed the effect of mobile banking adoption on financial inclusion among students in Indonesia. The study employed purposive sampling technique with a sample size of 400. Using linear regression for data analysis, the study concluded that mobile banking has a significant positive effect on financial Inclusion

Barnanga et al (2025) evaluated the impact of Fintech financial services on financial inclusion in Nigeria, with a focus on mobile banking, internet banking, Point of Sale (POS) terminals, and Automated Teller Machines (ATMs). The study was conducted using Secondary Data and the data collected was analysed using multiple regression. The findings reveal that mobile banking has the most significant effect on financial inclusion followed by POS terminals, Internet banking and ATMs also contribute positively, though to a lesser extent. The study concludes fin-tech financial services has a significant impact on financial inclusion and that fintech's financial services are critical to sustaining customer loyalty in Nigeria.

2.2 Theoretical Review

There are different theories that explain the relationship between digital banking and Financial inclusion. They include Technology Acceptance Model (TAM), Diffusion of Innovation (DOI) Theory, Financial Intermediation Theory; among others. The present study adopted Technology Acceptance Model (TAM) because it better explains how share prices react to information in the market.

2.2.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model by Davis (1989) posits that perceived usefulness and perceived ease of use determine users' acceptance of technology. TAM explains how students adopt digital banking channels: if digital platforms are easy and useful, adoption and financial inclusion increase (Venkatesh & Davis, 2000). Many studies apply TAM to digital banking in Nigeria, showing strong relationships between perceived usefulness and adoption (Ayo et al., 2016).

2.2.2 Diffusion of Innovation (DOI) Theory

Rogers' (2003) DOI theory explains how innovations spread across user groups. The theory's attributes involves relative advantage, compatibility, complexity, trialability, and observability, predict adoption. Mobile banking

and digital payments spread rapidly among youths because they offer observable benefits, low complexity, and compatibility with smartphones and campus life (Laukkanen, 2016).

2.2.3 Financial Intermediation Theory

Gurley and Shaw (1960) propounded the theory of financial intermediation. They are of the opin that financial intermediaries exist to reduce transaction costs and provide efficient financial services. Digital banking enhances intermediation by lowering operational costs and enabling greater financial access. This theoretical framework supports the idea that digital channels significantly expand financial inclusion among underserved groups, including students.

3. Methodology

The study employs cross-sectional design which provides a snapshot of the relationship at a particular point in time to examine the effect of digital banking channels (mobile banking, ATM, POS, internet banking, digital payment platforms) on financial inclusion of students of Kaduna State University. The research employs a structured questionnaire as the primary data collection instrument. The population of the study comprises of 19,782 (KASU Registry, 2026) registered undergraduate students of the Kaduna State University across all levels of study. Data collection for this study was conducted during the 2026 academic session, capturing current digital banking practices and their corresponding effects on financial Inclusion among students. This design is suitable because it enables the collection of responses from a large population and allows for statistical testing of the relationships among variables (Hair et al, 2022). All measurement items were rated on a 5-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree, adapted from previous validated studies. The questionnaire was adapted from Noor, (2017) for Financial Inclusion and for digital banking Khan et al. (2017).

The sample size was determined using Yamane's (1967) formula for finite populations, which amounted to 392. A 50% increase on the sample size is done which made the sample size to be 549. Stratified random sampling technique (Bowley, 1926) was used to ensure representations across colleges and faculties. This strategy increases representativeness and reduces sampling bias (Saunders et al., 2019). 539 questionnaires were recovered back, of which 42 questionnaires were found to be faulty and couldn't be used for the analysis, leaving the total number of sample size to be 497.

Reliability was assessed using Cronbach's Alpha, and all construct values were above the recommended minimum of 0.70, confirming internal consistency of the scale. Analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS software and the hypotheses of the study were tested using path coefficients, t-statistics, p-values, and R^2 values, evaluated at 5% significance level (Hair et al., 2022).

4. Results and discussion

Measurement model assessment is carried out in this study in order to check for the internal consistencies, the composite reliability test was conducted, as opined by Hair et al. (2022). This helps with giving a clear analysis of the reliability and validity indicators such as the Outer Loadings, composite reliability (CR), average variance extracted (AVE). The validity of a measurement model is established when the AVE is greater than 0.5, the CR and CA values are greater than 0.7, and the factor loading value is equal to or greater than 0.7 (Hair et al. 2022).

Although most factor loadings exceeded the recommended 0.7 minimum threshold, five items fell short of this benchmark. However, Hair, et al., (2022) suggest that indicators with loadings between 0.4 and 0.7 can be retained if their removal does not improve the model's average variance extracted (AVE) and composite reliability (CR). The five (5) deleted items (DPP1, DPP2, FI4, FI6 and FI12) however improved the AVE's consistent with Hair et al. (2019) recommendations. Following a meticulous evaluation, 27 of the 32 items measuring the study's constructs were deemed reliable and retained. The detailed outer loadings values are presented in Figure 2 and Table 1. This rigorous evaluation process ensured that only reliable indicators were retained, thereby maintaining the integrity and validity of the study's findings.

The results, summarized in Table 1, indicates that all the variables or constructs is above the recommended acceptable threshold of 0.70 for the composite Reliability, with the lowest composite reliability (CR) value being 0.853 representing the value for Internet Banking. This implies that all the constructs exhibit a good internal consistency which makes the data reliable for the study, hence giving validity to the findings of the study.

Convergent validity was evaluated by examining the Average Variance Extracted (AVE) values, following the guidelines set forth by Hair et al. (2022). AVE values exceeding 0.50 are generally considered indicative of satisfactory convergent validity. As presented in Table 1, the AVE values for the constructs spanned from 0.501 to 0.870, thereby surpassing the recommended threshold. This finding shows that the constructs exhibit adequate

convergent validity, suggesting that they effectively capture their respective theoretical domains. The AVE values collectively affirm that the constructs demonstrate satisfactory convergent validity.

In order to assess the Discriminant validity of the constructs, The HTMT matrix is assessed as shown in Table 2. Kline 2011 suggests that the figures in the HTMT matrix should not be greater than 0.85 and from table 2 above, the constructs in the study satisfied the required measurement thresholds, therefore discriminant Validity is confirmed, giving room for further evaluation of the structural model.

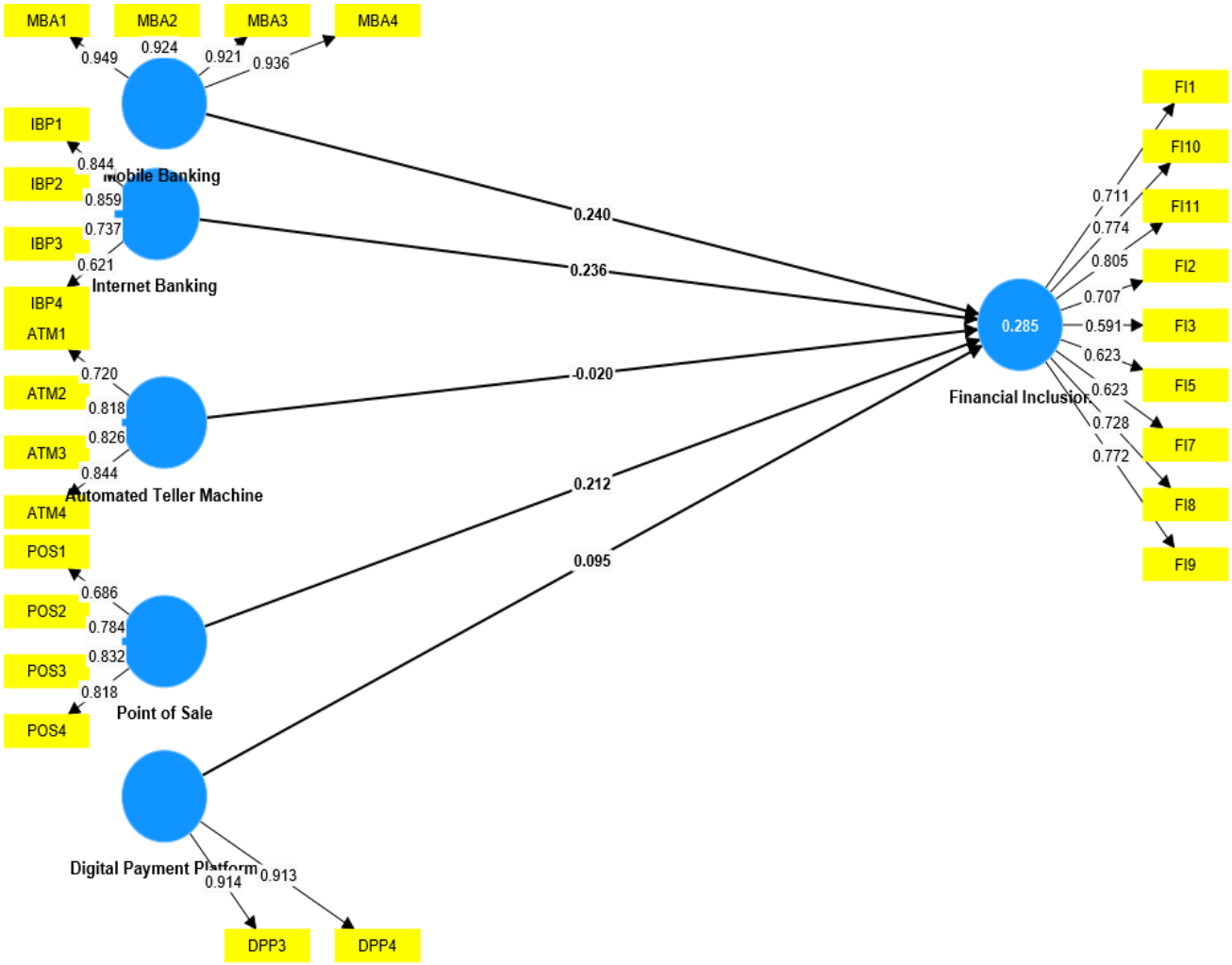


Figure 1: Measurement Model

Measurement Model Assessment

Table 1: Items loading, AVE and Composite Reliability

Constructs	Items	Items Loading	CR	AVE
Automated Teller Machines	ATM1	0.720	0.879	0.645
	ATM2	0.818		
	ATM3	0.826		
	ATM4	0.844		
Digital Payment Platforms	DPP3	0.914	0.910	0.835
	DPP4	0.913		
Financial Inclusion	FI1	0.711	0.899	0.501
	FI10	0.774		
	FI11	0.805		
	FI2	0.707		

	FI3	0.591		
	FI5	0.623		
	FI7	0.623		
	FI8	0.728		
	FI9	0.772		
Internet Banking	IBP1	0.844	0.853	0.595
	IBP2	0.859		
	IBP3	0.737		
	IBP4	0.621		
Mobile Banking	MBA1	0.949	0.964	0.870
	MBA2	0.924		
	MBA3	0.921		
	MBA4	0.936		
Point of Sale	POS1	0.686	0.862	0.611
	POS2	0.784		
	POS3	0.832		
	POS4	0.818		

Source: SMARTPLS 4

Table 2: Discriminant Validity (HTMT)

constructs	ATM	DPP	FI	IBP	MBA	POS
Automated Teller Machine						
Digital Payment Platform	0.216					
Financial Inclusion	0.389	0.256				
Internet Banking	0.659	0.144	0.456			
Mobile Banking	0.376	0.372	0.456	0.524		
Point of Sale	0.856	0.185	0.389	0.423	0.260	

Source: SMARTPLS 4

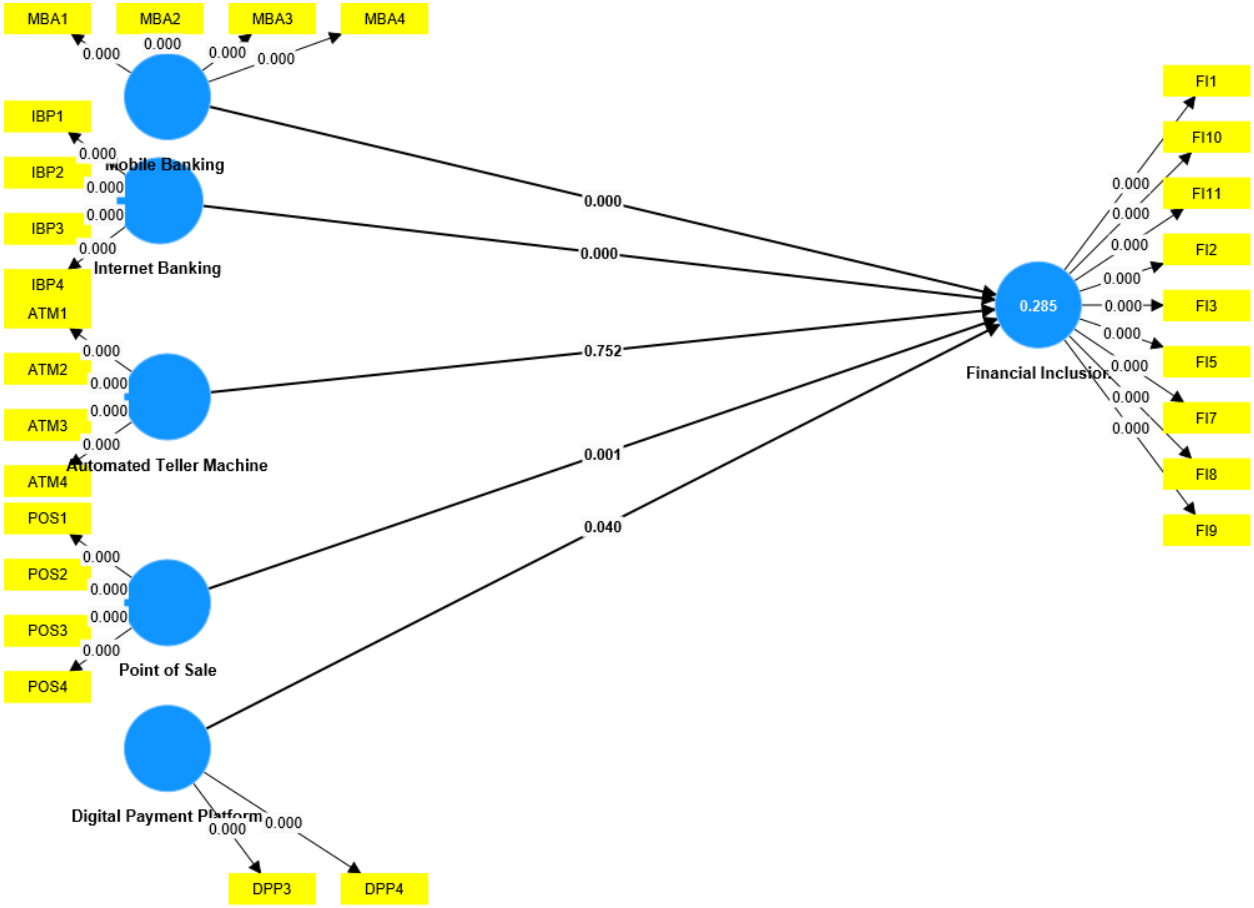


Fig. 2. Structural model

Table 3: Structural Assessment Model

	Hypothesis	Beta Value	Mean	STDEV	T statistics	P values	Decision
HO1	Mobile Banking -> Financial Inclusion	0.240	0.241	0.046	5.246	0.000	Reject
HO2	Automated Teller Machine -> Financial Inclusion	-0.020	-0.021	0.064	0.316	0.752	Accept
HO3	Point of Sale -> Financial Inclusion	0.212	0.216	0.061	3.471	0.001	Reject
HO4	Internet Banking -> Financial Inclusion	0.236	0.238	0.046	5.134	0.000	Reject
HO5	Digital Payment Platform -> Financial Inclusion	0.095	0.096	0.046	2.055	0.040	Reject

Source: SMARTPLS 4

Path analysis was conducted to assess if digital banking influences the financial Inclusion of students and to test the hypothesis formulated. The correlations between the latent variables, P values, T statistic values, and the values of all path coefficients are shown in Fig. 2 and Table 3. The analysis indicates that Mobile Banking (MBA) with (β= 0.240, T-value = 5.246 and P-*values* = 0.000) have a significant effect on the Financial Inclusion of students, which implies that a change in Mobile banking will lead to a significant and positive change in Financial Inclusion of Students. Based on this submission, the first hypothesis is rejected.

Automated Teller Machines (ATM) with (β= -0.020, t-value= 0.316, *p=0.752)* have an insignificant effect on Financial Inclusion. This implies that an increase in ATM's doesn't lead to any significant increase in Financial Inclusion. It is based on this, that the Null Hypothesis is accepted.
Meanwhile, Point of Sale (POS) with (β= 0.212, T-value = 3.471 and P-*values* = 0.001) have a significant effect on the Financial Inclusion of students, which implies that a change in Point of Sale (POS) will lead to a significant and positive change in Financial Inclusion of Students. Based on this submission, the third hypothesis is rejected.

Internet Banking (IBP) with (β= 0.236, t-value= 5.134, *p* = 0.000) has a significant effect on Financial inclusion. This implies that the more students use Internet Banking, the more they are financially included. It is on this basis that the fourth hypothesis was rejected as shown in Table 3.

Lastly, the result also indicates that Digital Banking Platforms (IBP) with (β= 0.095, t-value= 2.055, p = 0.040) has a significant effect on Financial inclusion. This implies that the more students use Digital Banking Platforms, the more they are financially included. It is on this basis that the fifth hypothesis was also rejected. Furthermore, the results reveal that MBA, ATM, POS, IBP and DPP collectively account for 29% of the variance in financial Inclusion which is represented by the R square as shown in table 2.

4.2 Discussions of findings

The study assessed the effect of digital banking on financial inclusion among students in KASU. The findings revealed that the model explains 28.5 % of variance in financial inclusion (R^2 = 0.285), indicating moderate explanatory power (Hair et al., 2022). This implies that digital banking play a moderate role in explaining financial inclusion among students. The findings of the study reveals that Mobile banking has the strongest predictor of financial inclusion (β = 0.240, p < 0.001) meaning that Mobile banking significantly affects Financial Inclusion. This finding is in line with the findings of (Sukumaran ,2025; Triyanti et al 2024). The result confirms that mobile banking is more inclined to youth financial inclusion.

Internet banking also was found to be significant to financial inclusion (β = 0.236, p < 0.001). This supports the findings of Barnanga et Al (2025) which implies that Internet banking allows students to manage funds, pay fees, and monitor transactions independently.

Furthermore, the results also suggest that POS usage significantly influences financial inclusion (β = 0.212, p = 0.001). This finding is in line with the work of Ene et al (2019) and Bazza et al (2023).This suggests that cashless infrastructure within campus environments strengthens integration into formal finance. POS terminals encourage traceable, secure, and efficient payments, reducing dependence on cash-based transactions.

In addition, Digital payment platforms also had a positive but weaker effect (β = 0.095, p = 0.040) on financial inclusion. Although statistically significant, the smaller effect size suggests that students may use fintech apps primarily for intra transfers rather than deeper financial services like savings or credit. This finding aligns with the findings of Revankar Et al (2023)

Finally, ATM services showed a negative and non-significant effect (β = -0.020, p = 0.752). This suggests that ATM usage does not substantially enhance financial inclusion among students. This finding is line with the finding of the study of Ene, et al (2019). This contradicts the findings of Barnanga, et al (2025). While ATMs improve physical access, they do not necessarily promote financial empowerment or digital integration.

5. Conclusion and Recommendation

This study examined the effect of digital banking channels on the financial inclusion of students in Kaduna State University using PLS-SEM analysis. The findings demonstrate that digital banking plays a significant role in enhancing financial inclusion among university students, explaining 28.5% of the variance in financial inclusion. Specifically, mobile banking, internet banking, POS usage, and digital payment platforms were found to have significant positive effects on financial inclusion. Among these, mobile banking emerged as the strongest predictor, closely followed by internet banking. These findings reinforce the argument that interactive, multifunctional, and internet-enabled financial technologies are central drivers of financial inclusion in digitally literate populations.

Conversely, ATM services were found to have no significant effect on financial inclusion. This suggests that while ATM infrastructure facilitates cash access, it does not substantially deepen financial engagement or promote broader participation in formal financial systems. The result highlights a structural shift from traditional electronic banking channels toward fully digital platforms.

Theoretically, the study confirms the relevance of the Technology Acceptance Model (TAM), Diffusion of Innovation (DOI) theory, and Financial Intermediation Theory in explaining digital financial behavior among students. Digital platforms that are perceived as useful, easy to use, and compatible with students' lifestyles are more likely to drive meaningful financial inclusion.

Overall, the study contributes to the growing literature on youth financial inclusion in emerging economies by demonstrating that digital banking (especially mobile banking) serves as a predictor of financial inclusion within university environments. This study recommends that:

Commercial banks should prioritize mobile banking innovations which can serve the needs of students. Since mobile banking showed the strongest impact, banks should enhance app functionality by integrating savings tools, micro-investment options, budgeting trackers, and student-friendly credit facilities.

Also, given the significant role of internet banking, policymakers and university administrators should invest in reliable and affordable internet access within campus environments. Improved connectivity will enhance the effectiveness of digital financial platforms.

Furthermore, Businesses around the campus should be encouraged to adopt POS to promote cashless transactions. The increased digital use of these businesses will help to strengthen its everyday financial use and reduce cash dependency.

Lastly, Fintech providers should expand beyond just transfers by integrating savings wallets, micro-credit options, and budgeting or financial planning features. This would transform digital payment platforms from transactional tools into instruments of deeper financial inclusion.

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