INVESTIGATING FACTORS THAT INFLUENCE THE ADOPTION OF CLOUD COMPUTING TECHNOLOGIES AMONG UNDERGRADUATES IN NIGERIAN UNIVERSITIES

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Abstract
This study investigates the factors influencing the adoption of cloud computing technologies among undergraduates in Nigerian universities, utilizing the Technology Acceptance Model (TAM) as a theoretical framework. The research focuses on key constructs including Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Financial Constraints (FC), alongside external variables such as Institutional Support and Security Concerns. A quantitative approach was employed, with data collected through a structured questionnaire titled Adoption of Cloud Computing Technologies Questionnaire (ACCTQ) distributed to participants across various universities. The analysis revealed significant direct effects on Behavioral Intention (BI) to adopt cloud computing technologies. Financial Constraints exhibited the strongest influence ($\beta = .65$, $p < .001$), followed by Perceived Ease of Use ($\beta = .24$, $p < .001$) and Perceived Usefulness ($\beta = .14$, $p < .001$). Notably, PEOU emerged as a significant predictor of PU ($\beta = .31$, $p < .001$), indicating that ease of use enhances perceptions of usefulness. Conversely, Institutional Support and Security Concerns did not show significant effects on BI. The model explained 54.6% of the variance in Behavioral Intention, highlighting the critical role of financial resources and usability in technology adoption decisions. The findings suggest that addressing financial constraints and improving user experience are essential for enhancing the adoption of cloud computing technologies in Nigerian higher education institutions. This study contributes to the understanding of cloud technology adoption in educational contexts and provides recommendations for policymakers and university administrators to facilitate the effective integration of cloud solutions into academic frameworks.

Keywords: adoption, cloud computing, technologies, technology acceptance model

Introduction

Cloud computing represents a transformative technology that organizations leverage to establish a robust technological framework for delivering their services (Krelja et al., 2018). When integrated into educational programmes, cloud computing enhances scalability and portability, providing access to a diverse array of cloud-based applications that support the academic goals of teachers and students alike (Alharthi et al., 2015; Stergiou et al., 2018). Essentially, cloud computing can be viewed as an extensive pool of virtualized resources that dynamically expand based on demand, operating under a pay-per-use pricing model (Sultan, 2010). Institutions are increasingly adopting cloud technology, which allows them to access computing resources and services via the Internet. This encompasses both software and hardware hosted in remote data centres (Pearson and Benameur, 2010). According to Rohani et al. (2015), embracing innovative technologies not only boosts organizational competitiveness but also enhances the efficiency and productivity of services, particularly in educational settings burdened by limited resources (Abdollahzadehgan et al., 2013). Key features of cloud computing include effective resource utilization, elasticity, pay-per-use models, and multi-tenancy (Agarwal, 2011). While the adoption of cloud computing offers numerous advantages, it also presents challenges. Organizations face significant hurdles such as inadequate system monitoring, identity management issues, accessibility concerns, and secure data governance (Cartes, 2014). As educational institutions navigate these complexities, they can unlock the potential of cloud computing to foster innovation and improve learning outcomes.

Transitioning from traditional classroom instruction to an online format represents a significant shift that requires meticulous planning and preparation (Bao et al., 2020). This transformation necessitates reliable technology for online education and an effective cloud service model to ensure high-quality experiences for both educators and learners (Almaiah et al., 2020). Higher education institutions are increasingly adopting cloud computing to facilitate this transition, as it allows for the sharing of IT services and provides essential tools for students and faculty (Islam et al., 2019). As technological advancements continue to evolve rapidly, many institutions are striving to keep pace. The integration of emerging technologies has become essential in the Information and Communication Technology (ICT) era, as these innovations can significantly enhance various organizational processes (Alhelou et al., 2021). In response to competitive pressures and changing environments, organizations are constantly seeking to modernize their offerings through new technologies, including cloud computing, which provides a streamlined method for delivering computing services over the Internet.

Research indicates that advancements in ICT have profoundly influenced educational resources, enabling institutions to concentrate more on core academic functions such as research (Udenor et al., 2018). Universities view cloud computing as a groundbreaking advancement in higher education, offering flexible and accessible IT-driven capabilities (Sultan, 2010). The rapid deployment of IT resources through cloud solutions is particularly advantageous for research purposes, surpassing traditional software platforms. Furthermore, cloud systems facilitate the implementation of progressive learning theories and collaborative educational practices. By utilizing centralized data storage and virtualization technologies, institutions can create enriched e-learning environments that enhance educational delivery. Given these advantages, cloud computing has become indispensable for numerous higher education institutions. Many organizations rely on technology not only to reduce costs but also to remain competitive and address the needs of students and faculty (Garcia-Penalvo et al., 2014). The accessibility and openness of cloud computing services allow higher education institutions to leverage existing knowledge collaboratively. For users, engaging with applications via cloud computing is often more cost-effective and adaptable.

The interest in cloud computing continues to grow significantly within both academic and business sectors, with the paradigm evolving rapidly. In the context of Nigeria, a developing nation, cloud computing presents an opportunity to access advanced technology and infrastructure without the need for substantial investment. The adoption of cloud computing in

Nigerian universities enables institutions to leverage modern technological solutions with minimal financial outlay and technical expertise (Rabiu & Abubakar, 2023). Cloud computing is poised to supplant outdated traditional computational models that rely on the establishment of data centers and internal infrastructure management. This shift is associated with cost reductions and enhanced responsiveness to organizational needs, which are critical in today's competitive landscape (Adeleke et al., 2020). As universities embrace cloud technology, they can focus more on core academic functions rather than being bogged down by the complexities of traditional IT systems.

Moreover, the integration of cloud computing allows educational institutions to adapt swiftly to changing demands for IT services while addressing budget constraints often faced in developing regions (Massadeh et al., 2013). For instance, Jordanian universities have recognized cloud computing as a viable solution to their limited financial support from the government, facilitating improved teaching and learning environments (Suryawanshi & Narkehde, 2012). The framework for cloud computing adoption in Nigerian universities incorporates various factors, including relative advantage, compatibility, complexity, security, and management support (Makoza, 2016). This comprehensive approach ensures that institutions can navigate the complexities of adopting such technologies effectively. By understanding these determinants, universities can enhance their decision-making processes regarding cloud implementation and overcome potential barriers.

The Concept of Cloud Computing

Cloud computing is a transformative technology that has revolutionized how individuals and organizations access and utilize computing resources. Defined as the on-demand delivery of computing services—including servers, storage, databases, networking, software, and analytics—over the internet, cloud computing enables users to store and manage data remotely rather than relying on local devices (Investopedia, 2025). This shift from traditional IT infrastructure to cloud-based solutions offers numerous benefits, including cost savings, scalability, flexibility, and enhanced performance (IBM, 2024). The concept of cloud computing is characterized by several essential features identified by the National Institute of Standards and Technology (NIST). These include on-demand self-service, allowing users to provision resources automatically; broad network access, enabling access from various devices; resource pooling, which allows multiple consumers to share resources; rapid elasticity, permitting scalable resource allocation; and measured service, which provides transparency in resource usage (Wikipedia, 2025). These characteristics facilitate a more efficient allocation of IT resources and allow organizations to respond swiftly to changing demands.

Cloud computing can be categorized into different service models: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). IaaS provides virtualized computing resources over the internet, while PaaS offers a platform allowing developers to build applications without managing the underlying infrastructure. SaaS delivers software applications via the Internet on a subscription basis, eliminating the need for local installation and maintenance (TechTarget, 2025). This flexibility in service models has made cloud computing an attractive option for businesses of all sizes. The deployment of cloud services occurs in various environments: public clouds, private clouds, and hybrid clouds. Public clouds are available to anyone over the internet, while private clouds are dedicated to specific organizations. Hybrid clouds combine elements of both public and private clouds, allowing for greater flexibility in resource management (Oracle Nigeria, 2024). This adaptability is particularly beneficial for organizations seeking to balance security with the need for scalable resources. As cloud computing continues to evolve, its impact on various sectors is becoming increasingly evident. In education, for instance, institutions are leveraging cloud technologies to enhance learning experiences through virtual classrooms and collaborative tools (Udenor et al., 2018). In business settings, companies are utilizing cloud solutions to support remote work arrangements and streamline operations (AWS, 2024).

Cloud computing has emerged as a pivotal technology in the education sector, transforming teaching, learning, and research methodologies. At its core, cloud computing enables institutions to access vast amounts of computing resources over the Internet, which can significantly reduce costs associated with maintaining traditional IT infrastructure (Helmi & Latifah, 2021). By leveraging cloud services, educational organizations can provide flexible and scalable solutions that cater to the diverse needs of students and faculty. This flexibility is particularly beneficial in accommodating remote and distance learning environments, which have gained traction in recent years due to global events such as the COVID-19 pandemic (Udenor et al., 2018).

One of the primary advantages of cloud computing in education is its ability to facilitate collaborative learning. Students can work together on projects in real-time, regardless of their physical location. This capability not only enhances teamwork skills but also allows for immediate feedback from instructors (Helmi & Latifah, 2021). Furthermore, cloud-based platforms enable educators to share resources and instructional materials easily, promoting a more integrated approach to teaching and learning (Saidu et al., 2020). Research indicates that cloud computing can enhance the overall educational experience by providing robust platforms for online education. These platforms allow for the creation of virtual classrooms where students can access lectures, participate in discussions, and submit assignments seamlessly (Adeleke et al., 2020). The reduction in physical infrastructure costs enables institutions to allocate resources more effectively towards improving educational quality and expanding course offerings (Massadeh et al., 2013).

Despite these benefits, the adoption of cloud computing in education is not without challenges. Security concerns remain a significant barrier, as educational institutions must ensure that sensitive student data is protected against breaches (Saidu et al., 2020). Additionally, issues related to compliance with regulations regarding data privacy can complicate the implementation process (Helmi & Latifah, 2021). Moreover, there is often a lack of technical expertise among staff members, which can hinder the effective utilization of cloud technologies (Pekane & Tanner, 2017). The literature also highlights the importance of institutional support in facilitating successful cloud adoption. Leadership commitment and investment in training programs are crucial for equipping educators with the necessary skills to leverage cloud technologies effectively (El Mhouti et al., 2018). Furthermore, fostering a culture that embraces technological innovation can encourage faculty and students to explore new pedagogical approaches enabled by cloud computing.

The adoption of cloud computing technologies in educational institutions, particularly in Nigerian universities, can be effectively analyzed using the Technology Acceptance Model (TAM). This model provides a framework for understanding the factors that influence users' decisions to accept and utilize new technologies. The core components of TAM include Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Behavioral Intention (BI). Additionally, external variables such as security concerns, institutional support, and internet quality can be integrated into this framework to provide a comprehensive understanding of cloud computing adoption for enhancing the overall effectiveness and efficiency of teaching, learning, and research in higher education institutions.

1. Perceived Usefulness (PU): Perceived usefulness refers to the degree to which users believe that using a particular technology will enhance their job performance or educational outcomes. In the context of cloud computing, if faculty and students perceive that cloud services improve collaboration, access to resources, and overall educational effectiveness, they are more likely to adopt these technologies. Research indicates that perceived usefulness is a significant predictor of technology acceptance (Ishola, 2017). For instance, findings from studies show that when users recognize the benefits of cloud computing such as improved accessibility to learning materials and enhanced communication there is a positive correlation with their intention to adopt these services.
2. Perceived Ease of Use (PEOU): Perceived ease of use is defined as the extent to which users believe that using a technology will be free from effort. In the realm of cloud computing, this encompasses the user-friendliness of cloud platforms and the simplicity with which users can navigate these systems. Research has demonstrated that higher levels of perceived ease of use lead to greater acceptance of cloud technologies (Opitz & Langkau, 2012). In educational settings, if faculty and students find cloud applications intuitive and straightforward, they are more inclined to integrate these tools into their teaching and learning practices.
3. Behavioral Intention (BI): Behavioral intention represents the user's motivation to engage with a technology or service. In TAM, both perceived usefulness and perceived ease of use directly influence behavioural intention. When users perceive cloud computing as beneficial and easy to use, their intention to adopt these technologies increases significantly. This relationship has been supported by empirical studies indicating that both PU and PEOU are critical determinants in driving the adoption process (Ishola, 2017).

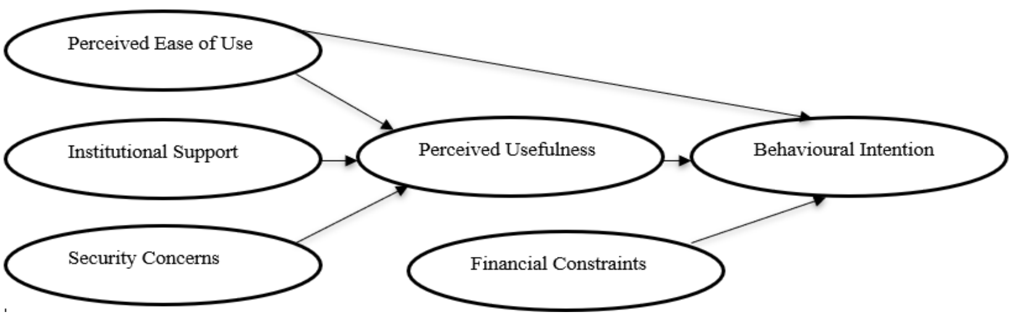
External Variables

4. Security Concerns: Concerns regarding data privacy and security can negatively influence both PU and PEOU. Users who fear potential data breaches may perceive cloud

services as less useful or more difficult to use due to concerns about managing sensitive information (Helmi & Latifah, 2021).

5. Institutional Support: The level of support provided by university administration is vital for fostering an environment conducive to technology adoption. Effective training programs and resources can enhance perceived ease of use and usefulness by equipping users with the necessary skills to navigate cloud platforms effectively (Adeleke et al., 2020).
6. Financial support: refers to the limitations imposed by budgetary restrictions that affect an institution's ability to invest in new technologies. In the context of Nigerian universities, these constraints can manifest in various ways, including inadequate funding for IT infrastructure, delays in budget releases, and insufficient resources for ongoing maintenance and support.

Figure 1: Study's research model



Statement of the problem

The adoption of cloud computing technologies in Nigerian universities offers significant opportunities to improve educational delivery, administrative processes, and research collaboration. However, the adoption rate remains slow due to various challenges. This study applies the Technology Acceptance Model (TAM) to explore the factors influencing cloud computing adoption in Nigerian higher education institutions. The TAM suggests that perceived usefulness (PU) and perceived ease of use (PEOU) are key factors influencing technology adoption. In Nigerian universities, challenges such as inadequate technological infrastructure, including unreliable internet connectivity, raise concerns about cloud computing's usefulness and security. Additionally, limited institutional support for training, security and privacy issues and financial constraints hinder cloud adoption. By addressing these barriers, this study aims to provide insights for enhancing cloud computing integration in Nigerian universities.

Research Hypothesis

The following research hypotheses are proposed to investigate the factors influencing the adoption of cloud computing technologies in Nigerian universities:

$H0_1$: Perceived Usefulness (PU) positively influences the Behavioral Intention (BI) to adopt cloud computing technologies among undergraduates in Nigerian universities.

H0$_2$: Perceived Ease of Use (PEOU) positively influences the Behavioral Intention (BI) to adopt cloud computing technologies among undergraduates in Nigerian universities.

H0$_3$: Perceived Usefulness (PU) is positively influenced by Perceived Ease of Use (PEOU) in adopting cloud computing among undergraduates in Nigerian universities.

H0$_4$: Institutional Support (IS) positively influences Perceived Usefulness (PU) regarding the adoption of cloud computing technologies among undergraduates in Nigerian universities.

H0$_5$: Security Concerns (SC) negatively influence the Perceived Usefulness (PU) of cloud computing technologies among undergraduates in Nigerian universities.

H0$_6$: Financial Constraints (FC) negatively impact the Behavioral Intention (BI) to adopt cloud computing technologies among undergraduates in Nigerian universities.

Methodology

Data Collection and Participants

The research employed a descriptive survey research design to investigate the adoption of cloud computing technologies among undergraduates in Nigeria. The population for this study is all undergraduates in Southwest Nigeria. Participants were reached through an electronic link to the survey questionnaire distributed through social networking platforms (WhatsApp and Telegram). The respondents were given three weeks to voluntarily complete and submit their responses via the online survey. The study received 488 complete responses, meeting the sample size criteria recommended by Weisberg and Bowen for social science research (Hill, 1998). Table 1 shows the demographic variables of respondents. Among the participants, 211 (43.2%) were male, and 277 (56.8%) were female, while a majority of the participants were aged between 19-23 years (29.0%).

Table1: *Demographic variables (N = 488)*

	Characteristics	N	%
Gender	Male	211	43.2
	Female	277	56.8
Age	<18	85	17.5
	19-23	141	29.0
	24-28	99	20.3
	29-33	96	19.7
	>33	66	13.5

Measurement

The measurement instrument's item development was adopted from validated past empirical studies and modified to fit the goal of the current study. The Technology Acceptance Model (TAM) constructs were adopted from Davis (1989), and comprised perceived usefulness (5 items), perceived ease of use (5 items), behavioural intention (5 items), security concern (5 items), institutional support (5 items), and financial concerns (5 items). To ensure clarity and appropriateness, two educational technology professors reviewed and revised all items, slightly modifying a few items' wording. The questionnaire consisted of 35 items, and respondents were asked to rate their responses using a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). The items were divided into two sections. Section (A) gathered demographic information from the participants, while section (B) elicited responses on participants' perceptions of the seven constructs as outlined in Figure 1.

Data Analysis

The data were imported and organized using the Statistical Package for the Social Sciences (SPSS) version 27. Subsequently, structural equation modeling (SEM) with AMOS was employed to test the hypotheses. As outlined by Hair et al. (2017), SEM analysis involves two primary phases: first, assessing the outer model, known as the measurement model, by computing metrics such as factor loadings, internal consistency reliability, convergent validity, and discriminant validity; second, measuring the inner model, referred to as the structural model, which involves hypothesis testing among the model constructs. The SEM analysis findings in this study adhere to the guidelines provided by Hair et al. (2019).

Result

Measurement Model Analysis

A Structural Equation Modeling (SEM) with AMOS was employed for analysis. As outlined by Hair et al. (2019), SEM analysis involves two primary phases: first, assessing the outer model, known as the measurement model, by computing metrics such as factor loadings, internal consistency reliability, convergent validity, and discriminant validity; second, measuring the inner model, referred to as the structural model, which involves hypothesis testing among the model constructs.

Confirmatory Factor Analysis (CFA) was computed using AMOS to test the measurement models. The first stage in evaluating the measurement model involved determining the construct validity, which refers to how well the items measure the intended concept. This is achieved by applying four analytical procedures: (1) assessment of item loadings; (2) internal consistency reliability (Cronbach's alpha and composite reliabilities); (3) convergent validity; and (4) discriminant validity. All the items calculated indicator loadings are displayed in Table 2.

Table 2: *Loadings, Reliability and Convergent Validity*

Latent Variable	Indicators	Item Loading	α	CR	AVE
Perceived Usefulness	PEOU 1	0.98	0.82	0.91	0.75
	PEOU 2	0.99			
	PEOU 3	0.50			
	PEOU 3	0.96			
	PEOU 5	0.67			
Perceived Ease of Use	PU 1	0.82	0.94	0.93	0.89
	PU 2	0.97			
	PU 3	0.98			
	PU 4	0.96			
	PU 5	0.94			
Security Concern	SC 1	0.75	0.87	0.83	0.79
	SC 2	0.86			
	SC 3	0.88			
	SC 4	0.87			
	SC 5	0.88			
Institutional Support	IS 1	0.98	0.88	0.83	0.75
	IS 2	0.93			
	IS 3	0.74			
	IS 4	0.86			
	IS 5	0.81			
Financial Concern	FC 1	0.94	0.87	0.89	0.67
	FC 2	0.94			
	FC 3	0.65			
	FC 4	0.70			
	FC 5	0.91			
Behavioural Intention	BI 1	0.69	0.96	0.94	0.76
	BI 2	0.94			
	BI 3	0.90			
	BI 4	0.92			
	BI 5	0.90			

Construct Reliability and Convergent Validity

As shown in Table 2, the reliability of constructs was evaluated using Cronbach's Alpha and Composite Reliability (CR). Cronbach's Alpha for each construct exceeded the threshold of 0.70, indicating good reliability. The Composite Reliability values ranged from 0.73 to 0.97, all above the 0.70 benchmark confirming that construct reliability was achieved for all variables (Nunnally and Bernstein, 1994; Hair et al., 2019). The Convergent validity was assessed by calculating the Average Variance Extracted (AVE). For most constructs, the AVE values were above the 0.50 threshold (Fornell & Larcker, 1981).

Discriminant validity

Discriminant validity in the study was assessed using the Fornell and Larcker Criterion. According to the Fornell and Larcker criterion, discriminant validity is established when the square root of AVE for a construct is greater than its correlation with the other constructs in the study (Fornell & Larcker, 1981). As illustrated in Table 3, discriminant validity was established using the Fornell and Larcker criterion indicating that the measurement model is reliable and valid.

Table 3: *Discriminant validity analysis and correlation matrix*.

	PEOU	PU	SC	IS	FC	BI
PEOU	***0.887***					
PU	0.731	***0.916***				
SC	0.719	0.782	***0.978***			
IS	0.762	0.561	0.315	***0.89***		
FC	0.70	0.556	0.361	0.365	***0.818***	
BI	0.703	0.479	0.241	0.792	0.797	***0.821***

The bolded value is the square root of AVE

Model Fit

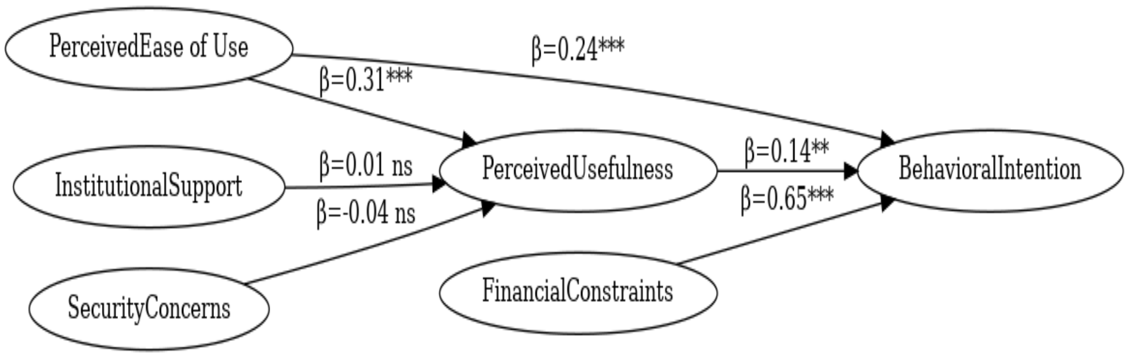
The model-fit measures were used to assess the model's overall goodness of fit (CMIN/df, GFI, CFI, TLI, SRMR, and RMSEA) and all values were within their respective common acceptance levels (Ullman, 2001; Hu and Bentler, 1998, Bentler, 1990). The seven-factor model (perceived usefulness, perceived ease of use, behavioural intention, security concern, institutional support and financial concerns) yielded a good fit (CMIN/df = 3.81, GFI = 0.91, CFI = 0.94, TLI = 0.901, SRMR = 0.66, and RMSEA= 0.6) which suggests that these results manifest that the research model has an acceptable fit over the minimum and maximum limit.

Structural Model Assessment

Table 5: *Summary of Hypothesis Testing*

H	Independent Variable	Path	Dependent Variable	Standardized Estimate	Standard Error	t-value	p-value	Decision
H1	PEOU	→	BI	0.046	0.047	2.940	***	Supported
H2	PU	→	BI	0.178	0.031	7.633	***	Supported
H3	FC	→	BI	0.596	0.028	23.180	***	Supported
H4	PEOU	→	PU	0.230	0.043	7.311	***	Supported
H5	IS	→	PU	-0.028	0.021	0.605	0.546	Not Supported
H6	SC	→	PU	-0.131	0.044	-0.984	0.326	Supported
R-Square				0.546				

Figure 2: *Standardized path coefficient results*



Assessment of the structural model involved analyzing the size of standardized path coefficients (β) and their respective significance levels (p-values) for each hypothesis, following the guidelines provided by Hair et al (2017) and Hair et al (2019). Results from Table 5 and Figure 2 revealed significant direct effects on Behavioral Intention. Financial constraint showed the strongest effect ($\beta = .65$, $p < .001$), followed by Perceived Ease of Use ($\beta = .24$, $p < .001$) and Perceived Usefulness ($\beta = .14$, $p < .001$). For Perceived Usefulness, only Perceived Ease of Use emerged as a significant predictor ($\beta = .31$, $p < .001$), while Institutional Support ($\beta = .01$, $p = .546$) and Security Concerns ($\beta = -.04$, $p = .326$) showed no significant effects. The model explained 54.6% of the variance in Behavioral Intention ($R^2 = .546$).

Discussion of findings

Hypothesis one of this study posits that Perceived Usefulness (PU) positively influences Behavioral Intention (BI) to adopt cloud computing technologies among undergraduates in Nigerian universities. The analysis results indicate that while the path coefficient for PU was significant ($\beta = .14$, $p < .001$), its effect on BI was relatively modest compared to other variables, particularly Financial Constraints ($\beta = .65$, $p < .001$) and Perceived Ease of Use ($\beta = .24$, $p < .001$). In the context of cloud computing in education, PU encompasses the belief that cloud technologies can improve access to resources, facilitate collaboration, and ultimately enhance academic performance. Research has consistently shown that when users perceive technology as useful, they are more likely to adopt it (Ishola, 2017; Omotunde & Omotunde, 2017; Rabiu & Abubakar, 2023). In this study, the findings further suggest that while PU does have a positive influence on BI, its impact is overshadowed by other factors such as financial constraints and ease of use. This could imply that even if students recognize the potential benefits of cloud computing, their intention to adopt may be significantly affected by external factors like budget limitations and the perceived simplicity of using these technologies.

The analysis also revealed for hypothesis three that Perceived Ease of Use emerged as a significant predictor of PU ($\beta = .31$, $p < .001$). This relationship indicates that if users find cloud computing technologies easy to use, they are more likely to perceive them as beneficial. This aligns with previous studies that emphasize the importance of usability in technology acceptance (Adeleke et al., 2020). Therefore, improving the user experience and providing adequate training could enhance perceptions of usefulness and subsequently influence behavioural intentions positively. The study also identified hypothesis four and hypothesis five; Institutional Support and Security Concerns as external variables affecting PU. However, both showed no significant effects on BI (Institutional Support: $\beta = .01$, $p = .546$; Security Concerns: $\beta = -.04$, $p = .326$). This finding raises important questions about how institutional policies and security measures are perceived by users. The lack of significant impact from institutional support suggests that universities may need to enhance their communication regarding the benefits and safety of cloud technologies to foster a more favourable perception among faculty and students.

Hypothesis two of this study posits that Perceived Ease of Use (PEOU) positively influences the Behavioral Intention (BI) to adopt cloud computing technologies among undergraduates in Nigerian universities. The analysis results indicate a significant positive path coefficient for PEOU ($\beta = .24$, $p < .001$), suggesting that ease of use is a crucial determinant in shaping users' intentions to adopt cloud technologies. In the context of cloud computing, this encompasses the user-friendliness of cloud platforms and the simplicity with which users can navigate these systems. Research consistently supports the notion that higher levels of perceived ease of use lead to greater acceptance and intention to adopt new technologies (Ishola, 2017; Omotunde & Omotunde, 2017; Udenor et al., 2018). This aligns with findings from various studies indicating that when users find technology easy to use, they are more likely to perceive it as beneficial, thereby increasing their intention to adopt it.

The significant positive relationship between PEOU and BI observed in this study highlights the importance of usability in fostering technology adoption. When undergraduates perceive cloud computing technologies as easy to use, their intention to integrate these tools into their academic activities increases. This finding is consistent with previous research that emphasizes the critical role of usability in technology acceptance, particularly in educational settings where users may have varying levels of technical proficiency (Omotunde & Omotunde, 2017; Adeleke et al., 2020). Moreover, the results suggest that enhancing the user experience through intuitive interfaces and comprehensive training programs could significantly bolster adoption rates. By simplifying the onboarding process and providing adequate support, institutions can alleviate apprehensions related to technology adoption among faculty and students.

Hypothesis six of this study posits that Financial Constraints (FC) positively influence Behavioral Intention (BI) to adopt cloud computing technologies among faculty and students in Nigerian universities. The analysis results reveal a significant and strong path coefficient for financial constraints ($\beta = .65$, $p < .001$), indicating that financial considerations play a crucial role in shaping users' intentions to adopt cloud computing technologies. In the context of Nigerian universities, these constraints can manifest in various ways, including limited funding for IT infrastructure, delays in budget releases, and insufficient resources for ongoing maintenance and support. Research has shown that financial limitations are among the primary barriers to adopting cloud computing technologies in educational institutions (Alimboyong, 2021; Rabiu & Abubakar, 2023).

The strong positive relationship between financial constraints and behavioural intention suggests that when undergraduates perceive that their institution has adequate financial resources to support cloud computing adoption, their intention to engage with these technologies increases significantly. Conversely, if they perceive a lack of financial support or anticipate difficulties in funding cloud services, their willingness to adopt may diminish.

Conclusion

This study aimed to investigate the factors that influence the adoption of cloud computing technologies among undergraduates in Nigerian universities, utilizing the Technology Acceptance Model (TAM) as a framework. The findings provide valuable insights into the factors influencing behavioural intention (BI) to adopt these technologies, highlighting the roles of Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Financial Constraints (FC).

The analysis revealed that Financial Constraints emerged as the strongest predictor of behavioural intention, with a significant positive path coefficient ($\beta = .65$, $p < .001$). This indicates that when undergraduates perceive adequate financial resources for adopting cloud computing, their intention to engage with these technologies increases. Conversely, concerns about budget limitations can hinder adoption efforts. Also, Perceived Ease of Use was found to significantly influence behavioural intention ($\beta = .24$, $p < .001$). Users who find cloud computing technologies easy to navigate are more likely to adopt them. Furthermore, PEOU positively impacted PU ($\beta = .31$, $p < .001$), suggesting that when users perceive cloud technologies as user-friendly, they are more likely to recognize their usefulness in enhancing educational outcomes. Perceived Usefulness, while positively influencing behavioural intention ($\beta = .14$, $p < .001$), had a more modest effect compared to financial constraints and ease of use. This finding highlights the importance of addressing usability issues to enhance perceptions of usefulness among potential users. External variables such as Institutional Support and Security Concerns did not show significant effects on behavioural intention, indicating that these factors may need further exploration in future research The model explained 54.6% of the variance in behavioural intention ($R^2 = .546$), demonstrating a substantial understanding of the dynamics influencing technology adoption in higher education settings.

Recommendations

Based on the findings of the study it was recommended that:

1. Institutions should prioritize user-friendly design in cloud applications to ensure that faculty and students can navigate these platforms with ease.
2. Undergraduates should be educated about the specific benefits of cloud computing for teaching, learning and research.
3. Institutions should provide comprehensive training on how to effectively use cloud technologies to maximize their potential benefits.
4. Institutions must prioritize budget allocations for technology investments, particularly for cloud computing services. Adequate funding can facilitate the acquisition of necessary infrastructure, training programs, and ongoing support services that enhance user experiences
5. Policymakers should consider implementing financial incentives or grants aimed at supporting cloud adoption in higher education institutions.

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