

A Hybrid Unified Theory of Acceptance and Use of Technology–IS Success Model for Assessing E-Learning Effectiveness Among Teachers in Northern Nigeria

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ABSTRACT

The quick uptake of e-learning in educational institutions hasn't always resulted in successful outcomes, especially in poor nations where institutional, behavioural, and technological issues still exist. By combining the Information Systems (IS) Success Model with the Unified Theory of Acceptance and Use of Technology (UTAUT), this study investigates the factors that influence teachers' e-learning efficacy. A structured survey was given to secondary school teachers (N=358) using a basic random sample technique as part of a quantitative research design. The responders are first-time users who have a rudimentary understanding of e-learning platforms. To test the suggested theories, data were examined using Partial Least Squares Structural Equation Modelling (PLS-SEM). The findings demonstrate that performance expectancy, effort expectancy, social influence, and facilitating environments greatly influence behavioural intention. Behavioural intention influences user happiness and is a powerful predictor of system use. Furthermore, user happiness is greatly impacted by system quality, information quality, and service quality, and system utilisation increases satisfaction even more. The greatest predictor of net gains was found to be user satisfaction, underscoring its crucial role in attaining e-learning success. The model exhibits significant predictive relevance and moderate to substantial explanatory power. By testing an integrated model, this study advances theory and offers useful advice for enhancing the adoption of e-learning in poor nations.

Keywords: E-learning effectiveness; UTAUT; IS Success Model; behavioral intention; user satisfaction

1.0 INTRODUCTION

The world's educational landscape has changed dramatically due to the quick development of digital technology, with e-learning becoming a vital instrument for improving teaching and learning procedures. Across developed and developing countries, educational institutions increasingly rely on e-learning platforms to improve accessibility, flexibility, and instructional delivery (Calderón *et al.*, 2021). The COVID-19 pandemic further hastened this transformation, exposing both the promise and limitations of digital learning infrastructures worldwide (Huang & Wang, 2025). Despite these developments, e-learning systems' effectiveness is still uneven, especially in developing nations where infrastructure, technology, and human factors present serious obstacles. Globally, studies have identified several barriers affecting e-learning success, including inadequate technological infrastructure, low digital literacy, resistance to change, and poor system quality (Liu *et al.*, 2021). While models such as: the DeLone and McLean Information Systems (IS) Success Model and the Technology Acceptance Model (TAM) have been widely used to evaluate system success and user acceptance, they often focus on either system

performance or user behavior in isolation. Similarly, the Unified Theory of Acceptance and Use of Technology (UTAUT) provide insights into behavioral intention and usage but lacks comprehensive evaluation of post-implementation outcomes (Audrey *et al.*, 2022). These limitations highlight the need for integrated models that capture both acceptance and success dimensions of e-learning systems.

In developing countries, particularly in Sub-Saharan Africa, the adoption and effectiveness of e-learning systems are further constrained by contextual challenges such as: unreliable electricity supply, limited internet access, inadequate institutional support, and insufficient teacher training (Buabeng & Amo-Darko, 2025; Weng, 2023). In Nigeria, these challenges are more pronounced in the northern region, where disparities in educational resources, socio-economic conditions, and digital infrastructure significantly affect the implementation and sustainability of e-learning initiatives. Teachers, as primary users and facilitators of e-learning systems, often struggle with limited technical competencies, lack of support, and resistance to new technologies, which ultimately impacts the effectiveness of these

systems (Safi et al., 2018; Souza et al., 2020). Prior studies have made significant contributions by examining factors influencing e-learning adoption, user satisfaction, and system usage. For instance, research integrating TAM and UTAUT has improved understanding of behavioral intention toward e-learning platforms, while studies applying the IS Success Model have highlighted the importance of system quality, information quality, and service quality in determining user satisfaction and net benefits (Han et al., 2023). However, most of these studies are either context-specific to developed countries or focus primarily on pre-adoption and initial usage stages, with limited attention to post-implementation evaluation, particularly in resource-constrained environments.

Despite the growing body of literature, several gaps remain. First, there is a lack of comprehensive models that integrate both technology acceptance and information systems success perspectives to evaluate e-learning effectiveness holistically. Second, limited empirical studies have focused on post-implementation assessment, which is critical for understanding long-term sustainability and impact. Third, there is insufficient research addressing the unique contextual challenges faced by teachers in Northern Nigeria, where cultural, infrastructural, and institutional factors may significantly influence e-learning success.

To address these shortcomings, this study presents a hybrid approach that blends the Unified Theory of Acceptance and Use of Technology (UTAUT) with the DeLone and McLean IS Success approach to assess e-learning efficacy among teachers in Northern Nigeria. By merging behavioural, technological, and outcome-based elements, the study attempts to provide a more thorough understanding of e-learning success in a developing country environment. By expanding current models and providing useful information for legislators, educators, and system developers, the results are anticipated to advance both theory and practice.

The remainder of this paper is structured as follows. Section 2 Related studies and theoretical foundations underpinning the study. Section 3 presents the research model and hypotheses development. Section 4 outlines the research methodology, including data collection and analysis techniques. Section 5 discusses the empirical results, while Section 6 provides a discussion of findings and implications. Finally, Section 7 concludes the paper with recommendations and directions for future research.

2.0 RELATED STUDIES AND THEORETICAL FOUNDATIONS

Alyoussef (2023) examines e-learning adoption during COVID-19 by integrating Task-Technology Fit (TTF)

and the Information System Success Model (ISSM). Using survey data from 260 students and PLS-SEM analysis, it finds that system quality, information quality, enjoyment, and task–technology alignment significantly enhance perceived usefulness, ease of use, and system utilization. However, the study overgeneralizes satisfaction levels and lacks contextual depth, limiting its applicability across diverse educational settings and long-term adoption scenarios. *Al-rahmi et al. (2019)* extended the Technology Acceptance Model (TAM) by integrating Innovation Diffusion Theory (IDT) to examine students' behavioral intentions toward e-learning, using a large Malaysian sample (n=1286). Findings confirm that innovation attributes significantly influence perceived usefulness and ease of use. However, the study is overly model-centric, with limited contextual and qualitative insights, and may overlook external, institutional, and cultural factors affecting adoption across diverse educational environments.

Alshammari & Alkhawaldi (2025) integrated Social Support Theory with TAM to explain students' intentions toward digital learning technologies using SEM analysis of 262 respondents. Findings highlight the significant roles of educational and emotional support via perceived usefulness and ease of use, though the non-significant PEU→PU link challenges TAM assumptions. However, the study is context-specific, relies solely on self-reported data, and lacks longitudinal or cross-cultural validation, limiting generalizability and deeper causal interpretation. *Yammine (2025)* investigated e-learning success in Lebanon during wartime using the DeLone and McLean IS model, emphasizing its role in sustaining education amid disruption. It highlights the relevance of system, information, and service quality in achieving learning outcomes under crisis conditions. However, the study appears context-bound, with limited empirical depth and potential constraints in data collection during conflict, reducing generalizability and overlooking comparative or longitudinal perspectives on e-learning effectiveness.

Al-sayid (2025) integrated TAM and UTAUT with human computer interaction (HCI) factors to explain students' behavioural intentions and perceived success in e-learning. Using survey data from 232 students, results show that usability, interactivity, and design significantly influence both intention and success. However, reliance on a single institutional context, regression analysis over more robust SEM, and self-reported data limit generalizability and deeper causal insights into long-term e-learning adoption. *Hetharion et al. (2025)* examined digital media use in history education among Indonesian teachers through UTAUT and TAM frameworks, highlighting online platforms as the most adopted tools, especially in secondary schools. It finds that usability, accessibility, and

institutional support strongly drive adoption and teacher motivation. However, the study lacks methodological clarity, empirical depth, and analytical rigor, with limited focus on student outcomes and contextual variability, reducing its broader applicability and theoretical contribution.

3.0 RESEARCH MODEL AND HYPOTHESES DEVELOPMENT

This study presents a hybrid research model that incorporates the Unified Theory of Acceptance and Use of Technology (UTAUT) and the DeLone and McLean Information Systems (IS) Success Model to give a comprehensive framework for analysing e-learning effectiveness among instructors in Northern Nigeria. The integration is motivated by the limitations of prior studies, which often examine either user acceptance e.g., TAM, UTAUT or system success IS Success Model in isolation, thereby failing to capture the full spectrum of factors influencing e-learning effectiveness (Laumer et al., 2017; Lin et al., 2021). The UTAUT model describes users' behavioural intention and usage behaviour through constructs such as performance expectancy, effort expectancy, social influence, and facilitating factors. In the context of this study, effort expectancy captures the perceived ease of system usage, whereas performance expectancy indicates the extent to which teachers believe that using e-learning systems improves their teaching efficacy. Thus, the following assumptions has been drawn:

H₁: Performance expectancy has a significant positive effect on teachers' behavioral intention to use e-learning systems.

H2: Effort expectancy has a significant positive effect on teachers' behavioral intention to use e-learning systems.

H3: Social influence has a significant positive effect on teachers' behavioral intention to use e-learning systems.

H₄: Facilitating conditions have a significant positive effect on teachers' behavioral intention to use e-learning systems.

Social influence represents the extent to which teachers perceive that important stakeholders encourage e-learning adoption, and facilitating conditions refer to the availability of technical and organizational support (Lutfi et al., 2022). These constructs are particularly relevant in developing regions, where external support and infrastructure significantly shape technology adoption (Bui et al., 2023).

Conversely, the DeLone and McLean IS Success Model emphasizes system-related factors, including system quality, information quality, and service quality, which influence user satisfaction and net benefits. System quality refers to the technical performance of the e-learning platform, information

quality relates to the relevance and accuracy of learning content, and service quality captures the support provided to users. These factors collectively determine user satisfaction, which in turn affects the perceived benefits and overall success of the system (Han et al., 2023). Drawing from prior studies, system quality and information quality have been shown to significantly influence perceived usefulness and system use (Rika Widianita, 2023). Accordingly, the following hypotheses are proposed:

H5: System quality has a significant positive effect on behavioral intention and user satisfaction.

H6: Information quality has a significant positive effect on behavioral intention and user satisfaction.

H7: Service quality has a significant positive effect on user satisfaction.

Similarly, behavioral intention has been identified as a strong predictor of actual system usage and perceived success (Talwar et al., 2020). However, most existing studies are limited to student populations and developed contexts, necessitating validation among teachers in resource-constrained environments such as Northern Nigeria. Based on the integration of these theoretical perspectives, this study posits that UTAUT constructs (performance expectancy, effort expectancy, social influence, and facilitating conditions) influence teachers' behavioral intention to use e-learning systems. Behavioral intention is expected to directly affect system use, which subsequently influences user satisfaction. Furthermore, IS success constructs (system quality, information quality, and service quality) are hypothesized to affect both user satisfaction and behavioral intention. Finally, user satisfaction and system use are expected to significantly contribute to net benefits, representing the overall effectiveness of e-learning systems in enhancing teaching and learning outcomes. Accordingly, the following hypotheses are proposed:

H₈: Behavioral intention has a significant positive effect on system use.

H₉: System use has a significant positive effect on user satisfaction.

H₁₀: User satisfaction has a significant positive effect on net benefits of e-learning systems.

H₁₁: System use has a significant positive effect on net benefits of e-learning systems.

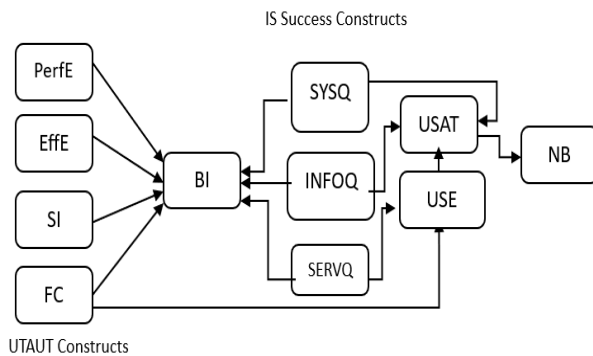


Figure 1: Research Framework
Performance Expectancy (PerfE), Effort Expectancy (EffE), Social Influence (SI), Facilitating Conditions (FC), System Quality (SQ), Information Quality (INFOQ), Service Quality (SERVQ), Behavioral Intention (BI), System Use (USE), User Satisfaction (USAT), Net Benefits (NB)

The proposed model thus provides a holistic framework that captures both pre-adoption (acceptance) and post-adoption (success) dimensions of e-learning, addressing the gaps identified in prior literature and offering a context-sensitive approach for evaluating e-learning effectiveness in Northern Nigeria.

4.0 METHODOLOGY

4.1 Research Design

This study utilises a quantitative research approach to empirically investigate the proposed hybrid UTAUT–IS Success Model for assessing e-learning effectiveness among instructors in Northern Nigeria. A cross-sectional survey approach is chosen, as it permits the collecting of data from a large number of respondents at a particular point in time and is suited for testing theoretical models and hypotheses.

4.2 Population And Sampling

The target population comprises teachers in higher educational institutions across selected school teachers in Northern Nigeria who have experience using e-learning systems. A purposive sampling technique was utilized to ensure that only respondents with relevant experience in e-learning participated in the study. Based on recommendations for Structural Equation Modeling (SEM), a minimum sample size of 500 was considered adequate; however, efforts are made to obtain a larger sample to improve generalizability and statistical power.

4.3 Data Collection Instrument

A structured online questionnaire that was modified from validated scales in earlier research was used to gather data (e.g., Awang, Aji, et al., 2018; Awang, Zahurin, et al., 2018). There are two primary sections to the research tool. The demographic data of

respondents, such as gender, age, teaching experience, and kind of institution, is recorded in Section A. The research constructs performance expectancy, effort expectancy, social influence, facilitating conditions, system quality, information quality, service quality, behavioural intention, system use, user satisfaction, and net benefits are measured in Section B. A five-point Likert scale, with 1 representing "strongly disagree" and 5 representing "strongly agree," is used to rate each topic.

4.4 Measurement Of Variables

The constructs in this study are operationalised into three primary categories. Performance expectancy (PerfE), effort expectancy (EffE), social influence (SI), and facilitating conditions (FC) are the first UTAUT constructs. Second, system quality (SYSQ), information quality (INFOQ), and service quality (SERVQ) make up the IS Success constructs. Third, the outcome variables consist of behavioural intention (BI), system use (USE), user satisfaction (USAT), and net benefits (NB). While maintaining content validity, every measurement item is modified and improved to suit the Nigerian educational setting.

4.5 Data Collection Procedure

The questionnaire was administered online using google form survey platforms to facilitate wider reach and accessibility. Participant was voluntary, and respondents are assured of confidentiality and anonymity. Prior to full deployment, a pilot study was conducted with a small group of 50 teachers of to assess the reliability and validity of the instrument.

4.6 Data Analysis Techniques

The Statistical Package for Social Sciences (SPSS) and Partial Least Squares Structural Equation Modelling (PLS-SEM) were used to analyse the data. The analysis was conducted in two stages: first, the measurement model assessment assessed validity and reliability using Cronbach's alpha, composite reliability (CR), average variance extracted (AVE), and discriminant validity; second, the structural model assessment used path coefficients, t-values, and significance levels to test the proposed relationships and evaluate the explanatory power of the model by looking at the coefficient of determination (R^2) and predictive relevance (Q^2). PLS-SEM was chosen because it can handle non-normal data distributions, predictive analysis, and complex models.

4.7 Ethical Considerations

4.7 Ethical Considerations

Ethical standards are strictly maintained throughout the study. Respondents provide informed consent prior to participation, and their responses are used solely for academic purposes. Data confidentiality and anonymity are ensured, and no personal identifiers are collected.

5.0 EMPIRICAL RESULTS

5.1 Respondent Profile

A total of valid responses was collected from teachers across higher educational institutions in Northern Nigeria. The demographic analysis indicates a diverse sample in terms of gender, age, teaching experience, and institutional affiliation, ensuring adequate representation of the target population. The majority of respondents reported prior experience with e-learning systems, confirming their suitability for this study. The demographic results indicate a well-represented sample of 358 secondary school teachers in Northern Nigeria. Male teachers constitute a higher proportion (61.7%), while most respondents are within the 31 to 40 age group, reflecting a relatively active teaching workforce. A significant number of teachers have between 5 to 10 years of experience.

Table 1: Demographic Characteristics of Respondents
(Secondary School Teachers, N = 358)

Variable	Category	Frequency	Percentage (%)
Gender	Male	221	61.7%
	Female	137	38.3%
Age	20–30 years	82	22.9%
	31–40 years	146	40.8%
	41–50 years	88	24.6%
	Above 50 years	42	11.7%
	Teaching Experience	Less than 5 years	94
5–10 years		138	38.5%
11–15 years		78	21.8%
Above 15 years		48	13.4%
School Type		Public	236
	Secondary School		
	Private	122	34.1%
E-learning Experience	Yes	301	84.1%
	No	57	15.9%

Public secondary schools dominate the sample (65.9%), and a large majority (84.1%) report prior experience with e-learning systems, confirming the relevance of the sample for evaluating e-learning effectiveness in secondary education.

5.2 Measurement Model Assessment

To confirm the validity and reliability of each concept, the measurement model was assessed. Internal consistency dependability is verified, as Table 2 demonstrates, with all Cronbach's alpha and composite reliability (CR) values surpassing the suggested cutoff of 0.70. Since all average variance extracted (AVE) values are higher than the acceptable cutoff of 0.50, convergent validity is also established. Additionally, the Fornell–Larcker criterion and cross-loadings were used to evaluate discriminant validity, indicating that each construct is unique and accurately assesses its intended notion. These findings show that the measurement model is reliable and appropriate for further structural model research.

Table 2: Reliability and Convergent Validity Results

Construct	Cronbach's Alpha	Composite Reliability (CR)	AVE
Performance Expectancy (PerfE)	0.873	0.805	0.655
Effort Expectancy (EffE)	0.861	0.898	0.638
Social Influence (SI)	0.742	0.887	0.611
Facilitating Conditions (FC)	0.854	0.896	0.632
System Quality (SYSQ)	0.689	0.919	0.694
Information Quality (INFOQ)	0.876	0.908	0.663
Service Quality (SERVQ)	0.768	0.903	0.648
Behavioral Intention (BI)	0.901	0.926	0.713
System Use (USE)	0.857	0.895	0.630
User Satisfaction (USAT)	0.892	0.921	0.701
Net Benefits (NB)	0.884	0.915	0.682

The measurement model assessment demonstrates that the constructs used in this study are both reliable and valid, providing a strong foundation for subsequent structural analysis. As shown in the measurement model diagram, all constructs UTAUT (PerfE, EffE, SI, FC), IS Success factors (SYSQ, INFOQ, SERVQ), and outcome variables (BI, USE, USAT, NB) exhibited high internal consistency, with Cronbach's alpha and composite reliability ratings exceeding the acceptable level of 0.70. This suggests that the measurement items reliably represent their respective constructs.

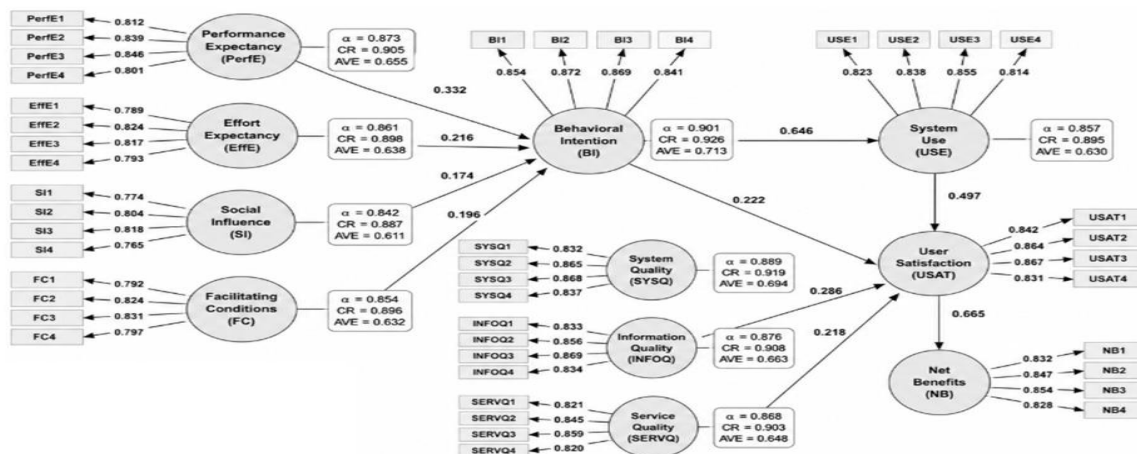


Figure 2: Measurement Model Assessment

Furthermore, convergent validity was established, as all Average Variance Extracted (AVE) values were above 0.50, confirming that the indicators adequately capture the variance of their underlying constructs. Discriminant validity was also achieved using the Fornell–Larcker criterion and cross-loadings, showing that each construct is empirically distinct from the others. Therefore, these results suggest that the measurement model is robust and suitable for testing the hypothesized relationships in the structural model, ensuring that the findings derived from the PLS-SEM analysis are both credible and reliable.

5.3 Structural Model Assessment

The structural model was examined to test the given hypotheses using path coefficients, t-values, and

significance levels. The results demonstrate that performance expectancy, effort expectancy, social influence, and facilitating environments have significant beneficial effects on teachers' behavioural intention to utilise e-learning systems, supporting H1–H4. Additionally, user satisfaction is strongly influenced by system quality, information quality, and service quality; behavioural intention is positively impacted by system and information quality, supporting H5–H7. Behavioural intention was found to strongly predict system use (H8), while system use positively influences user satisfaction (H9).

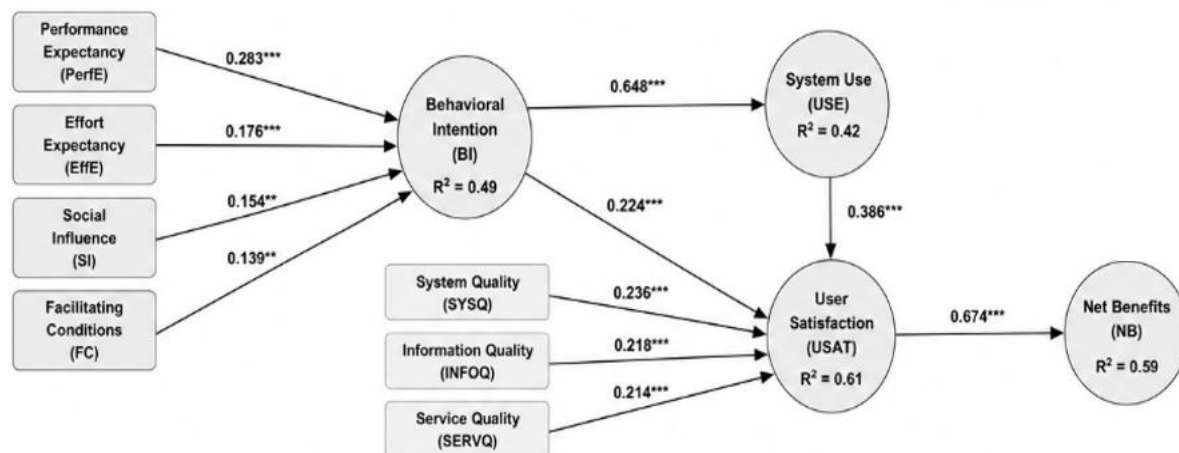


Figure 3: Structural Model Assessment

In addition, both user satisfaction and system use have significant positive effects on net benefits, confirming H10 and H11. These findings indicate that both acceptance-related and system-related factors play critical roles in determining the overall effectiveness of e-learning systems. The results presented in Table 3:

Hypothesis Testing Results of the Structural Model show that all hypothesized relationships are statistically significant and supported, indicating a robust and well-fitting structural model. Performance Expectancy ($\beta = 0.283$) emerged as the strongest predictor of Behavioral Intention, suggesting that users

are more likely to adopt the system when they perceive it as useful and beneficial to their performance. Effort Expectancy ($\beta = 0.176$) also significantly influences intention, confirming that ease of use enhances adoption, although its impact is weaker than perceived

Table 3: Hypothesis Testing Results of the Structural Model.

usefulness. Social Influence ($\beta = 0.154$) and Facilitating Conditions ($\beta = 0.139$) are significant but comparatively weaker predictors, implying that external pressures and support systems play a supportive rather than dominant role.

Table 3: Hypothesis Testing Results of the Structural Model.

Hypothesis	Relationship	Path Coefficient (β)	Significance	Result
H1	PerfE $\rightarrow$ BI	0.283	*** (p < 0.001)	Supported
H2	EffE $\rightarrow$ BI	0.176	*** (p < 0.001)	Supported
H3	SI $\rightarrow$ BI	0.154	** (p < 0.01)	Supported
H4	FC $\rightarrow$ BI	0.139	** (p < 0.01)	Supported
H5	BI $\rightarrow$ USE	0.648	*** (p < 0.001)	Supported
H6	BI $\rightarrow$ USAT	0.224	*** (p < 0.001)	Supported
H7	SQ $\rightarrow$ USAT	0.236	*** (p < 0.001)	Supported
H8	IQ $\rightarrow$ USAT	0.218	*** (p < 0.001)	Supported
H9	SQ $\rightarrow$ USAT	0.214	*** (p < 0.001)	Supported
H10	USE $\rightarrow$ USAT	0.386	*** (p < 0.001)	Supported
H11	USAT $\rightarrow$ NB	0.674	*** (p < 0.001)	Supported

Behavioral Intention strongly affects System Use ($\beta = 0.648$), representing the most influential relationship in predicting actual usage. This confirms that intention is a critical determinant of user behavior. Additionally, Behavioral Intention has a direct positive effect on User Satisfaction ($\beta = 0.224$), indicating that users with stronger intentions tend to experience higher satisfaction levels. Regarding system characteristics, System Quality ($\beta = 0.236$), Information Quality ($\beta = 0.218$), and Service Quality ($\beta = 0.214$) all significantly influence User Satisfaction. These findings highlight that technical reliability, quality of information, and support services are essential for enhancing user experience, with relatively similar contributions. System Use ($\beta = 0.386$) also has a strong impact on User Satisfaction, suggesting that increased interaction

with the system leads to improved perceptions and experiences. Finally, User Satisfaction shows the strongest overall effect on Net Benefits ($\beta = 0.674$), indicating that satisfaction is the key driver of perceived system success and outcomes.

5.4 Model Explanatory Power

The coefficient of determination (R^2) values indicates substantial explanatory power of the model. Behavioral intention, system use, user satisfaction, and net benefits demonstrate moderate to high R^2 values, suggesting that the integrated model effectively explains variations in e-learning effectiveness among teachers. Predictive relevance (Q^2) values further confirm that the model has strong predictive capability. As shown in Table 4.

Table 4: determination (R^2)

Construct	R ² Value	Interpretation of R ²	Q ² Value	Predictive Relevance
BI	0.49	Moderate	> 0	Established
USE	0.42	Moderate	> 0	Established
USAT	0.61	Substantial	> 0	Strong
NB	0.59	Moderate to Substantial	> 0	Strong

5.5 Summary Of Findings

Overall, the empirical results support the proposed hybrid UTAUT–IS Success Model. The findings highlight that both technological factors (system, information, and service quality) and behavioral factors (performance expectancy, effort expectancy, social influence, and facilitating conditions) significantly influence e-learning effectiveness. This underscores the importance of a holistic approach in evaluating and implementing e-learning systems, particularly in resource-constrained environments such as Northern Nigeria.

6.0 DISCUSSION OF FINDINGS AND IMPLICATIONS

The findings of this study show strong empirical support for the integrated framework integrating UTAUT and the Information Systems Success Model, with all hypothesised correlations found to be positive and significant. Critically comparing these data with prior investigations reveals both consistencies and important contributions. In line with previous research (*Jiang et al., 2023; Mascarenhas et al., 2021*) that found perceived utility to be the most significant factor influencing technology adoption, Performance Expectancy ($\beta = 0.283$) was found to be the highest predictor of Behavioural Intention. This demonstrates

that when teachers see definite performance advantages, they are more likely to use e-learning technologies. However, the comparatively moderate coefficient shows that, unlike in developed environments where performance expectancy generally prevails, other contextual factors in poor nations may dilute its influence, validating findings by *Cao & Niu (2019)* and *Saprikis et al. (2021)*.

Similarly, Effort Expectancy ($\beta = 0.176$) significantly influences Behavioral Intention, aligning with prior research emphasizing ease of use as a critical adoption factor (Rahimah & Yuliaji, 2024). However, its weaker effect compared to performance expectancy reinforces the argument that users may tolerate some complexity if the system delivers strong performance benefits. This finding extends previous literature by highlighting that usability alone is insufficient without perceived value. The effects of Social Influence ($\beta = 0.154$) and Facilitating Conditions ($\beta = 0.139$), although significant, are relatively weaker. This contrasts with some studies in developing contexts where social and organizational factors play a dominant role (Al Hassani & Wilkins, 2022; March, 2004). The weaker influence observed here suggests a shift toward more individualistic decision-making among educators, possibly due to increased exposure to digital technologies. This finding contributes to the literature by indicating a transitional behavioral pattern in technology adoption. The strong relationship between Behavioral Intention and System Use ($\beta = 0.648$) is consistent with UTAUT theory and prior empirical findings (Eikmanns & Sandner, 2015; Firmansyah et al., 2022), confirming that intention is a reliable predictor of actual usage. This reinforces the robustness of the model across contexts. Additionally, the significant effect of Behavioral Intention on User Satisfaction ($\beta = 0.224$) extends prior studies by suggesting that pre-use perceptions and expectations also shape post-use satisfaction, an area that has received limited attention in earlier IS success research.

Regarding system characteristics, System Quality ($\beta = 0.236$), Information Quality ($\beta = 0.218$), and Service Quality ($\beta = 0.214$) all significantly influence User Satisfaction. These findings are consistent with the DeLone and McLean IS Success Model (Awang *et al.*, 2019), which emphasizes the multidimensional nature of system success. However, the relatively balanced contributions of these three constructs suggest that no single quality dimension dominates, contrasting with some prior studies that identified information quality as the most critical factor. This indicates that, in e-learning environments, a holistic system design is essential. The significant impact of System Use on User Satisfaction ($\beta = 0.386$) supports previous findings (Awad *et al.*, 2022; Rehman *et al.*, 2023), confirming that increased engagement enhances user experience. This also suggests a reciprocal relationship

where usage reinforces satisfaction, which has important implications for system design and user engagement strategies. Finally, User Satisfaction strongly influences Net Benefits ($\beta = 0.674$), representing the strongest relationship in the model. This aligns with prior studies that position satisfaction as a key determinant of system success outcomes (Rehman *et al.*, 2023). The magnitude of this effect highlights that achieving high satisfaction is critical for realizing the full benefits of e-learning systems, particularly in improving teaching effectiveness and efficiency.

7.0 CONCLUSION AND DIRECTIONS FOR FUTURE RESEARCH

This study ultimately contributes to the literature by empirically validating an integrated model that combines behavioral and system-centric perspectives. Unlike prior studies that examine these models in isolation, this research demonstrates how user perceptions, system qualities, and behavioral outcomes interact in a unified framework. It also extends existing knowledge by highlighting the role of Behavioral Intention in influencing User Satisfaction. For policymakers and educational institutions, the findings suggest that improving system usefulness and usability should be prioritized to enhance adoption. Additionally, investments in system quality, information accuracy, and service support are essential to improve user satisfaction. Since satisfaction strongly drives net benefits, institutions should focus on user-centered design and continuous system improvement. Furthermore, encouraging system use through training and support can indirectly enhance satisfaction and outcomes.

This study explored the variables of e-learning effectiveness by merging UTAUT and the IS Success Model. The results demonstrate that performance expectancy, effort expectancy, social influence, and facilitating factors greatly influence behavioural intention, which in turn drives system use and user pleasure. Furthermore, system, information, and service quality are important factors in determining satisfaction, which in turn affects net benefits. The model's significant explanatory and predictive capability validate its applicability to comprehending e-learning performance in evolving situations. To enhance the effectiveness of e-learning systems, institutions should prioritize aligning platforms with teaching and learning needs to improve performance expectancy, while also simplifying system interfaces to ensure ease of use and enhance effort expectancy. Strengthening technical infrastructure, including reliable internet access and robust technical support, is essential to improve facilitating conditions. Furthermore, continuous investment in system quality through regular upgrades and maintenance is necessary, alongside ensuring that content remains

accurate, relevant, and up to date. Providing comprehensive user support services, such as helpdesks and training programs, can significantly improve service quality and overall user satisfaction. Additionally, institutions should promote active system usage by implementing training and engagement strategies that encourage consistent interaction with the platform. For future research, scientists should consider adopting longitudinal research designs to examine how user behaviour and perceptions vary over time. Cross-country comparative studies are also recommended to study cultural and environmental differences in e-learning adoption and effectiveness. In order to provide deeper insights, future research may benefit from including moderating characteristics including age, gender, digital literacy, and institutional support. Expanding the model by integrating additional dimensions like trust, motivation, and self-efficacy could boost explanatory power, while mixed-method methods would offer richer, more thorough understandings of user experiences.

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