Journal of Educational Innovation and Research
https://journal.dnahorizonpress.com/index.php/JEIR
e-ISSN : xxxx.xxxx
DnA Horizon Press
Vol. 1, No. 1, 16-22, 2025
Research Article

The Relationship Between Undergraduate Students' Satisfaction and Artificial Intelligence (AI) Subscriptions for Learning Practices in Oyo State

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Article Info
Article History:
Received: 19-08-2025
Revised: 21-08-2025
Accepted: 10-09-2025

Keywords:
Satisfaction;
Subscription types
Freemium
AI literacy

ABSTRACT
This study investigated undergraduate students' satisfaction with Artificial Intelligence (AI) tools for learning and the relationship with subscription type in Oyo State, Nigeria. Anchored in the Expectation–Confirmation Model, it examined whether satisfaction levels differ across subscription types (Free, Freemium, Paid, and Institution-provided). A descriptive cross-sectional survey design was employed; 50 undergraduates from one state university completed a validated questionnaire (Cronbach's α = 0.842). Data were analysed using descriptive statistics and Tukey HSD post-hoc comparisons. Results showed an overall satisfaction mean of 3.10/4.0, indicating approval of AI tools. However, satisfaction varied significantly by subscription type: Freemium users reported the highest satisfaction, significantly exceeding Free (Δ = 0.583, p = .012), Paid (Δ = 1.000, p = .009), and Institution-provided users (Δ = 1.000, p = .004); no significant differences existed among the latter three groups. Thus, the null hypothesis of no relationship between satisfaction and subscription continuation was rejected. The findings extend technology acceptance theory by demonstrating that perceived value and confirmed expectations, rather than payment tier alone, drive satisfaction and continuance intention. Universities and policymakers should adopt Freemium-oriented access strategies, strengthen AI literacy programmes, and institute ethical guidelines to maximise pedagogical value and ensure responsible AI integration.

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1. Introduction

In the last decade, Artificial Intelligence (AI) has rapidly penetrated higher-education ecosystems across Nigeria, and Oyo State in particular has witnessed a surge in AI-driven learning platforms such as Coursera, edX, Meta AI tutors, and locally developed chatbots that are accessible only through paid subscriptions. While these tools promise personalised feedback, adaptive content and on-demand tutoring, their actual value is ultimately judged by the undergraduate students who pay for them. Whether students continue to subscribe or abandon the platforms depends largely on how satisfied they feel after using the services. Understanding the antecedents of this satisfaction and its behavioural consequences is therefore crucial for university managers, platform providers and policy makers who are allocating scarce resources to digital learning infrastructure.

This research stands on the Expectation–Confirmation Theory, also known as the Expectation–Confirmation Model (ECM) in ICT research. Oliver (1980) first postulated, and Bhattacherjee (2001) later adapted, for explaining continuance IS use. The ECM postulates that user satisfaction after adoption hinges on expectations being confirmed by experience. This confirmation then affects perceived usefulness, which, together with satisfaction, influences continuation intention. (Bhattacherjee, 2001; Sae-Tae et al. 2024). Recent studies in AI-driven e-learning confirm that when students perceive the AI features as useful and their expectations are positively confirmed, satisfaction

How to cite this article:
M. İ. Babatunde. (2025). The Relationship Between Undergraduate Students' Satisfaction and Artificial Intelligence (AI) Subscriptions for Learning Practices in Oyo State. *Journal of Educational Innovation and Research*, 1(1):16-22

increases, which in turn predicts continuance intention (Al-Adwan et al., 2022). Conversely, when the AI platform fails to deliver the promised personalised learning paths or instant feedback, negative disconfirmation leads to dissatisfaction and discontinuance.

Applying the ECM to the Oyo State context, undergraduate students arrive at AI learning platforms with pre-usage expectations about improved grades, time savings and interactive tutoring (*OSF*, 2025; Vieriu & Petrea, 2025). For example, after a period of paid subscription, freemium, or premium, university-paid, they evaluate whether the AI service has met these expectations (confirmation). A positive gap enhances perceived usefulness ("this AI tutor really improved my GPA") and generates satisfaction, making students more willing to renew their subscriptions (Alshammari & Babu, 2025; Carissa et al., 2023). A negative gap, however, reduces both perceived usefulness and satisfaction, leading to churn (Kim et al., 2017; Ribeiro et al., 2023). Consequently, the relationship between students' satisfaction and their decision to continue paying for AI subscriptions becomes a critical indicator of sustainable AI adoption in higher education (Nagubandi, 2024).

Despite the global popularity of ECM in technology acceptance studies, its application to AI subscription behaviour among undergraduates in Oyo State remains scant. Previous Nigerian studies have largely focused on free AI, maybe chat, language models, where financial commitment is minimal (Adediran et al., 2025; Bali et al., 2024; Inuwa-Dutse, 2025; Nwile et al., 2025; S et al., 2025). The peculiarity of voluntary, recurring payments for AI services introduces a behavioural nuance not fully captured by earlier ECM applications. Therefore, this study examines whether undergraduate students' satisfaction significantly relates to their continued AI subscriptions for learning practices in Oyo State.

Research Question

Q1: How satisfied are undergraduate student with using AI tools for their learning practices in Oyo state

Hypotheses

HO1: There is no significant relationship between undergraduate satisfaction and AI subscriptions for learning practice

2. Methods

The study employed a descriptive cross-sectional survey design, which enabled the collection of data from respondents at a single point in time, thereby providing a snapshot of undergraduate students' use of artificial intelligence (AI) for learning in Oyo State, Nigeria. The accessible population comprised all undergraduate students in universities within the state, from which a pilot sample of fifty (50) students was drawn. A two-stage sampling procedure was adopted: first, one university was purposively selected based on accessibility and geographical proximity; second, within each selected university, simple random sampling was used to select the respondents.

A researcher-designed questionnaire, consisting of two sections: demographic information and items on students' satisfaction with AI tools, was the primary data collection instrument. To ensure validity, the instrument underwent expert review by specialists in Educational Technology and Test and Measurement, and their suggestions were incorporated into the final version.

For reliability, a pilot test was conducted with thirty students outside the main sample, and the instrument achieved a Cronbach's alpha coefficient of 0.842, demonstrating strong internal consistency. Ethical clearance was secured from the selected universities, and questionnaires were personally administered and retrieved by the researchers, ensuring a 100% response rate. Data analysis combined descriptive and inferential statistics: frequencies, percentages as well as bar charts were used to present demographic information, and mean scores were used to answer the research question, while the hypothesis was tested using Tukey HSD multiple comparisons at a 0.05 level of significance. This methodological framework ensured both the rigour and reliability of the study's findings

3. Results

3.1 Demographic Information

Table 1: Table: Distribution of AI Subscription Types

AI Subscription Types	Frequency	Percent
Free	36	72.0
Freemium (limited free features with optional paid upgrades)	7	14.0
Paid (monthly/annual subscription)	3	6.0
Institutional/University-provided	4	8.0
Total	50	100.0

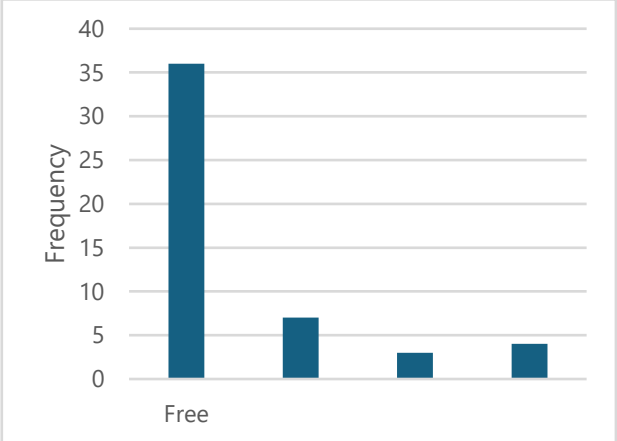

Figure 1: Table: Distribution of AI Subscription Types

Table 1 and Figure 1 present the distribution of AI subscription types among the respondents, showing that the majority of students (72%) rely on Free subscriptions, making it the most commonly used option. A smaller proportion (14%) reported using Freemium subscriptions, which provide limited free features with optional paid upgrades.

Meanwhile, University-provided subscriptions account for 8% of the sample, and only 6% of students reported using Paid subscriptions. This pattern suggests that most students prefer cost-free access to AI tools, possibly due to financial constraints or the availability of sufficient features in the free versions. The relatively low uptake of Paid and Institutional subscriptions indicates that these options are less accessible or less attractive to students, while the modest usage of Freemium may reflect students' willingness to balance free access with the flexibility of potential upgrades.

3.2 Research Question One: How satisfied are undergraduate student with using AI tools for their learning practices in Oyo state

Table 2: Undergraduate Students' Satisfaction with the Use of AI Tools for Learning Practices in Oyo State

Items	Mean
AI tools help me complete academic tasks more efficiently.	3.38
The interface of the AI tools is user-friendly and easy to navigate.	3.30
Feedback provided by AI tools (e.g., grammar, content) is accurate for improving my work.	3.38
Feedback provided by AI tools (e.g., grammar, content) is useful for improving my work.	3.44
The AI tools adapt content to match my individual learning preferences.	3.16
AI tools improve my ability to collaborate with classmates on academic projects.	3.22
I trust the accuracy of the AI tools' suggestions and outputs.	2.86
I trust the reliability of AI tools' suggestions and outputs.	3.06
I am concerned about academic dishonesty when using AI tools for assignments.	2.38
AI tools enhance my learning without the need for human instruction.	2.86
Average mean	3.10

Table 2 presents the analysis of undergraduate students' satisfaction with the use of AI tools for learning in Oyo State revealing an overall average mean score of 3.10. Using a four-point Likert scale, where 1.00–1.49 = Strongly Dissatisfied, 1.50–2.49 = Dissatisfied, 2.50–3.49 = Satisfied, and 3.50–4.00 = Strongly Satisfied, the results indicate that students are generally satisfied with AI tools in their learning practices. Items such as efficiency in completing academic tasks (Mean = 3.38), usefulness of feedback (Mean = 3.44), and user-friendly interfaces (Mean = 3.30) received relatively higher satisfaction ratings. However, areas such as trust in accuracy and reliability (Means = 2.86 and 3.06, respectively) and concerns about academic dishonesty (Mean = 2.38) scored lower, highlighting areas of scepticism and ethical concern. Overall, the findings suggest that while AI tools are positively received for enhancing efficiency, feedback, and usability, issues of trust and academic integrity remain key challenges to their broader acceptance.

3.3 Hypotheses Testing

HO1: There is no significant relationship between undergraduate satisfaction and AI subscriptions for learning practice

Table 3: Multiple Comparisons of Undergraduate Satisfaction by AI Subscription Type (Tukey HSD Test)

Dependent Variable:	satisfaction		
(I) AI subscription types	(J) AI subscription types	Mean Difference (I-J)	Sig.
Free	Freemium (limited free features with optional paid upgrades)	-.58333*	.012
	Paid (monthly/annual subscription)	.41667	.394
	Institutional/University-provided	.41667	.281
Freemium (limited free features with optional paid upgrades)	Free	.58333*	.012
	Paid (monthly/annual subscription)	1.00000*	.009
	Institutional/University-provided	1.00000*	.004
Paid (monthly/annual subscription)	Free	-.41667	.394
	Freemium (limited free features with optional paid upgrades)	-1.00000*	.009
	Institutional/University-provided	.00000	1.000
Institutional/University-provided	Free	-.41667	.281
	Freemium (limited free features with optional paid upgrades)	-1.00000*	.004
	Paid (monthly/annual subscription)	.00000	1.000

The results of the Tukey HSD post-hoc test indicate significant differences in undergraduate students' satisfaction with AI tools across subscription types. Specifically, students using Freemium subscriptions reported significantly higher satisfaction compared to those using Free subscriptions (Mean Diff. = 0.583, p = .012), Paid subscriptions (Mean Diff. = 1.000, p = .009), and University-provided subscriptions (Mean Diff. = 1.000, p = .004). This finding highlights that Freemium models, which combine free features with optional upgrades, are perceived as the most satisfying option.

On the other hand, no significant differences were observed among Free, Paid, and Institutional/University-provided subscriptions, as their mean differences were statistically non-significant ($p > .05$). This suggests that satisfaction levels among these three groups are relatively similar. Overall, the analysis rejects the null hypothesis of no significant relationship, showing that the type of AI subscription significantly influences students' satisfaction, with Freemium users experiencing the highest levels of satisfaction.

4. Discussion

The present study revealed that undergraduate students in Oyo State are generally satisfied with the use of AI tools for learning. This aligns with extant literature demonstrating that students perceive AI platforms as efficient, supportive, and useful for academic tasks such as generating feedback, clarifying concepts, and enhancing study practices (Prather et al., 2023; Fijačko et al., 2023; Kiesmüller & Romeike, 2023). The relatively high satisfaction levels suggest that the AI tools deployed in Oyo State universities have met students' expectations in line with the Expectation–Confirmation Model (Bhattacherjee, 2001). In particular, confirmation of anticipated benefits, such as time-saving, ease of use, and improved learning outcomes, appears to have reinforced students' positive evaluations, consistent with findings that expectation confirmation directly fosters satisfaction in AI-supported learning (Zhang & Asghar, 2025; Chan & Hu, 2023).

However, the data further indicate that satisfaction varies significantly across subscription types, with freemium users reporting the highest satisfaction compared to their peers on free, paid, or institution-provided tiers. This observation extends the global literature, which has shown that while subscription can increase access to advanced features and higher engagement intensity, it does not necessarily translate into proportionately higher satisfaction (Wu et al., 2024; Baig & Yadegaridehkordi, 2024). The higher satisfaction among freemium users may be explained by their balanced experience of enjoying essential AI functionalities at little to no cost, thereby achieving a favourable cost–benefit ratio. Conversely, dissatisfaction among paid users may stem from unmet expectations of premium features or heightened sensitivity to value-for-money considerations (Yu et al., 2024). This pattern confirms earlier findings that subscription status alone is not a direct determinant of satisfaction; rather, satisfaction is mediated by perceived usefulness, confirmation of expectations, and alignment with students' learning needs (Henderson et al., 2025; Luo et al., 2025).

Notably, while students appreciated the efficiency and feedback provided by AI, concerns about trustworthiness and academic dishonesty persisted. These findings resonate with previous reports highlighting challenges such as inaccuracies, over-reliance, and ethical ambiguities as barriers to sustained satisfaction (Prather et al., 2023; Kiesmüller & Romeike, 2023; Chan & Hu, 2023). As the literature suggests, satisfaction is highest when students are equipped with critical appraisal skills and guided by clear institutional policies that enable them to use AI ethically and productively (Zhang & Asghar, 2025; Cotton et al., 2023). Therefore, the persistence of trust-related concerns among Oyo State undergraduates underscores the urgent need for policy frameworks, ethical guidelines, and AI literacy interventions to optimize satisfaction and ensure responsible use.

Taken together, the findings lend empirical support to the null hypothesis that satisfaction is not inherently determined by subscription status but rather by perceived value and alignment with learning objectives. The implication for higher education managers and policymakers in Nigeria is that investments in AI integration should prioritize training, scaffolding, and ethical clarity rather than simply expanding paid subscription packages. As previous studies have shown, sustainable AI adoption in education depends less on payment models and more on embedding AI into pedagogical design, supporting self-efficacy, and ensuring that students' expectations are adequately confirmed (Baidoo-Anu & Ansah, 2023; Yu et al., 2024; Nagubandi, 2024).

The findings highlight the necessity for universities and policymakers in Oyo State to strengthen AI literacy programs that enhance students' ability to critically evaluate and responsibly use AI tools. While students expressed satisfaction with AI's efficiency and usability, their lingering concerns about trustworthiness and academic dishonesty call for the development of institutional guidelines, ethical policies, and training workshops. Furthermore, since Freemium subscriptions yielded the highest satisfaction, higher education institutions should consider hybrid access models that provide essential free features while offering optional premium support, ensuring affordability without sacrificing user experience. These insights suggest that resource allocation should prioritise training and ethical safeguards over simply expanding paid subscription access, thereby maximising the pedagogical value of AI tools.

The results extend the Expectation–Confirmation Model (ECM) by showing that student satisfaction with AI tools is not determined solely by subscription type but by the alignment of cost–benefit expectations with actual experiences. Freemium users' higher

satisfaction underscores the importance of perceived value in shaping positive attitudes, suggesting that satisfaction is mediated by a balance between accessibility and functionality. Moreover, the persistence of trust and ethical concerns reinforces the idea that technology satisfaction theories must incorporate ethical and trust dimensions when applied to AI in education. This contributes to the growing body of knowledge on technology adoption, confirming that usability, reliability, and ethical considerations are critical determinants of sustained satisfaction in AI-supported learning environments

A major limitation of this study lies in its relatively small sample size of fifty (50) undergraduate students drawn from a single university in Oyo State, which restricts the generalizability of the findings to a wider population of Nigerian undergraduates. Additionally, the reliance on self-reported data may have introduced response bias, as students' perceptions of AI tools may not fully reflect their actual usage behaviors. Future research should therefore consider employing a larger and more diverse sample across multiple states or regions to enhance representativeness, and complement survey data with qualitative methods such as interviews or focus groups to provide deeper insights into students' experiences, motivations, and ethical concerns surrounding AI-assisted learning.

5. Conclusion

This study set out to determine how satisfied undergraduate students in Oyo State are with AI tools for learning and to test whether satisfaction significantly relates to continued AI subscription behaviour. The results show that students are generally satisfied, yet satisfaction is not evenly distributed across subscription types. Specifically, Freemium users report the highest satisfaction, significantly exceeding that of Free, Paid and Institution-provided tiers, while no statistically significant differences exist among the latter three. Consequently, the null hypothesis—claiming no relationship between satisfaction and AI subscription practice—is rejected.

By integrating the Expectation–Confirmation Model with behavioural cost–benefit reasoning, this research contributes the first empirical evidence that subscription status alone does not dictate satisfaction; rather, perceived value and confirmed expectations are the decisive factors. Practically, universities and platform providers should prioritise ethical guidelines, AI-literacy programmes and hybrid Freemium models that balance affordability with functional depth, ensuring sustainable adoption of AI-enhanced learning in Nigerian higher education.

Article Information Form

Acknowledgments

I sincerely appreciate the students of Ladoke Akintola University of Technology (LAUTECH) for their kind support and cooperation in responding to my questionnaire. Your willingness to participate and provide valuable information greatly contributed to the success of this research. I remain grateful for the time, effort, and insights you generously shared..

Authors' Contribution

Ibrahim Babatunde Mutiu is the sole author of this paper and is responsible for the entire research process. He conceived the study idea, anchored the theoretical framework in the Expectation–Confirmation Model, and designed the descriptive cross-sectional survey. He developed the questionnaire, secured ethical clearance, and personally administered and retrieved all 50 instruments, achieving a 100 % response rate. He conducted the reliability pilot, performed all descriptive and inferential analyses including Tukey HSD comparisons and interpreted the findings. He drafted, reviewed, and revised every section of the manuscript, prepared the final version, and approved it for submission.

Declaration of Conflict of Interest

The authors declare no conflict of interest.

Artificial Intelligence Statement

AI tools, specifically Grammarly, was used for grammar check. AI was not used for critical processes like data collection or analysis.

Ethical Approval

Before distributing the questionnaire, approval is obtained from the necessary authorities in the target institution. Participants were asked voluntarily to participate and their response are completely anonymous.

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