

Perception of Artificial Intelligence Interactive Platforms for HIV/AIDS Awareness among Selected Private Secondary School Students in Abeokuta North, Ogun State

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Abstract

Introduction: Evidence on Nigerian secondary school students' awareness, perceptions, and willingness to use AI interactive platforms for HIV/AIDS education remains limited, despite the promise of these tools for improving adolescents' access to accurate HIV information.

Methods: A descriptive cross-sectional study was conducted among 330 students from three selected private secondary schools in Abeokuta North Local Government Area, Ogun State, Nigeria. Participants were selected using a stratified random sampling technique. Data were collected using a pre-tested structured questionnaire comprising Yes/No items for awareness and acceptance factors, and a 4-point Likert scale (strongly agree, agree, disagree, strongly disagree) for perception, then analysed using descriptive statistics.

Results: Overall awareness was moderate; 189 students (57.3%) demonstrated high awareness (≥ 4 correct Yes responses out of 7 items, mean = 4.00 ± 1.3), while 215 (65.2%) had heard of AI but only 124 (37.6%) had previously used AI-based tools for health learning. Perceptions were generally positive, with 224 students (67.9%) classified as having favourable views based on composite Likert scores; 257 (77.9%) found AI more engaging, and 251 (76.1%) valued its confidentiality and non-judgemental nature. Acceptance was high (219 students, 66.4%), with digital access (85.8%), privacy and trust (84.2%), and platform usability (82.7%) as the strongest influencing factors.

Conclusion: Students in selected private secondary schools perceived AI platforms positively for HIV/AIDS awareness due to their interactivity and anonymity. Integration of AI tools into school curricula and improved ICT infrastructure are recommended to address gaps in practical exposure and digital access.

Keywords: Artificial intelligence, HIV/AIDS awareness, Secondary school students, Perception, Interactive platforms

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Introduction

The rapid growth of technology in the 21st century has transformed global health communication, especially among young people. Artificial Intelligence (AI), a subset of computer science focused on creating systems capable of performing tasks that typically require human intelligence, has emerged as a transformative tool in education and public health (1, 2, 3, 4). Interactive AI platforms such as chatbots, virtual tutors, and gamified educational applications are increasingly leveraged to promote health literacy, providing

personalised, engaging, and real-time learning experiences aligned with the digital habits of today's youth (1, 2). Particularly in the context of HIV/AIDS awareness, AI has shown potential to bridge knowledge gaps, especially in low- and middle-income countries (3, 4).

Globally, AI is being used to disseminate information about HIV/AIDS through virtual agents, mobile-based chatbots, and augmented reality tools. Studies report that more than 67% of adolescent girls and young women in Cameroon expressed willingness to use technology-driven platforms for



From the South, for the South, with the World

HIV prevention education (5). In China, approximately 72.4% of college students accessed HIV-related information through AI-enhanced platforms (6). These technologies offer anonymity, flexibility, and accessibility, enabling young people to receive health education at their own pace, thus overcoming social stigma and cultural limitations often associated with sexual health discussions (7).

In Africa, the rise in mobile technology has created new avenues for reaching adolescents with accurate health information. With mobile penetration exceeding 44% in sub-Saharan Africa as of 2023, AI integration is steadily becoming a feasible option in education and healthcare (8). Despite this potential, there is limited empirical evidence on how secondary school students in Nigeria perceive the use of AI platforms specifically for HIV/AIDS awareness (9). In Nigeria, only 29% of female adolescents and 35% of males possess comprehensive knowledge of HIV/AIDS, and cultural sensitivity, digital exposure, and institutional support greatly influence engagement with reproductive health education (10, 11).

No published study has specifically quantified the awareness, perceptions, or willingness of Nigerian secondary school students to use AI interactive platforms for HIV/AIDS awareness and education, a gap this study directly addresses. In Abeokuta North, Ogun State, students in private secondary schools are increasingly exposed to digital devices and online learning environments, yet no documented evidence exists on how these students perceive the use of AI interactive platforms specifically for HIV/AIDS education. Understanding students' perceptions is therefore crucial, as it will inform the development and integration of culturally sensitive, student-friendly, and effective AI-based interventions that can support both public health goals and academic growth. Similar gaps exist in the developing world and require urgent attention (12)

This study therefore aimed to assess the perception towards the use of artificial intelligence interactive platforms for creating awareness and improving knowledge of HIV/AIDS in selected private schools within Abeokuta North, Ogun State, specifically addressing: (1) their level of awareness of AI platforms; (2) their perceptions of the effectiveness and reliability of AI-delivered HIV/AIDS information; and (3) the factors influencing their acceptance and willingness to use such platforms.

Methods

Study Design and Setting

A descriptive cross-sectional research design was adopted. The study was conducted among students in three private secondary schools in Abeokuta North Local Government Area, Ogun State, Nigeria: Comprehensive Academy (Lafenwa), Peace Foundation International College (Agbeloba), and Ultimate Landmark College (Lafenwa). These schools were purposively selected because private schools in the area tend to offer greater access to digital infrastructure and exhibit higher levels of digital literacy

compared to public schools, making them suitable settings for assessing perceptions of AI-based educational tools (8). However, it should be noted that this limits the generalizability of findings to similar private secondary school populations; results may not be representative of students in public or rural schools where digital access is considerably lower.

Study Population and Sample Size

The population consisted of 1,288 secondary school students aged 10 to 19 years, enrolled in Junior Secondary School 1 (JSS1) to Senior Secondary School 3 (SSS3) across the three selected private schools in Abeokuta North: 657 from Comprehensive Academy, 309 from Peace Foundation International College, and 322 from Ultimate Landmark College. Students within this age range are developmentally capable of understanding HIV/AIDS-related concepts and are likely to have experience with digital technology, making them appropriate participants for this study.

Inclusion Criteria

1. Students enrolled in JSS1 to SSS3 in Comprehensive Academy, Peace Foundation International College, or Ultimate Landmark College in Abeokuta North.
2. Students present and available during the period of data collection.
3. Students willing to participate and whose parents or legal guardians provided written informed consent.

Exclusion Criteria

1. Students not enrolled in JSS1 to SSS3 in the three selected private schools.
2. Students absent during the data collection period.
3. Students who declined participation or whose parents/guardians did not provide informed consent.

Sample Size Determination

The sample size was determined using Slovin's formula: $n = \left(\frac{N}{1+N(e)^2} \right)$, Where N = total population (1,288) and e = margin of error (0.05):

$$n = \left(\frac{1288}{1 + 1288 \times (0.05)^2} \right)$$

$$n = \left(\frac{1288}{1 + 1288 \times (0.0025)} \right)$$

$$n = \left(\frac{1288}{1 + 3.22} \right) \quad n = \left(\frac{1288}{4.22} \right)$$

$$n \approx 305.2$$

A design effect of 1.0 was assumed, given the stratified random sampling procedure, as Slovin's formula was applied for its simplicity. It is acknowledged as a limitation that this formula assumes simple random sampling; future studies may wish to apply a formula that formally accounts for the stratified design. A 10% attrition rate was then applied. Final sample size = $\frac{305}{(305 \times 0.10)} = 305 + 30.5 \approx 336$

Samples were proportionally allocated across schools based on each school's share of the total population: Comprehensive Academy $\frac{657}{1288} \times 336 = 171$ students, Peace Foundation International College: $\frac{309}{1288} \times 336 = 81$ students, Ultimate Landmark College: $\frac{322}{1288} \times 336 = 84$ students. Out of 336 distributed questionnaires, 330 were adequately completed and included in the final analysis, yielding a response rate of 98.2%. Six incomplete questionnaires (1.8%) were excluded using listwise deletion.

Sampling Technique

A stratified random sampling technique was adopted. Participants were stratified first by school (three strata: Comprehensive Academy, Peace Foundation International College, and Ultimate Landmark College) and then further stratified by gender within each school, based on actual male and female population distributions. This ensured proportional representation of both schools and gender groups in the final sample.

Following stratification, simple random sampling was applied within each stratum. Class registers of JSS1 to SSS3 were obtained from school authorities, and participants were selected using computer-generated random numbers to ensure objectivity and equal probability of selection for every eligible student.

Instrument for Data Collection

Data were collected using a pre-tested structured questionnaire developed based on the objectives of the study and relevant literature. The questionnaire comprised four sections:

Section A collected socio-demographic characteristics, including age, sex, class level, religion, and digital access indicators (device ownership, internet use frequency, prior use of digital platforms for learning, and prior HIV/AIDS education in school).

Section B assessed awareness of AI interactive platforms for HIV/AIDS education using seven Yes/No items. Sample items included: "Have you ever heard of Artificial Intelligence (AI)?" "Are you aware that AI platforms can be used for health education?", and "Have you ever used any AI-based platform to learn about health topics?" Each "Yes" response was scored 1 and each "No" scored 0, giving a maximum possible awareness score of 7. Students who answered 'Yes' to four or more items (score ≥ 4 , equivalent to $\geq 57\%$) were classified as having high awareness; those scoring below 4 were classified as having low awareness. This median-split cut-off is consistent with dichotomous awareness classification approaches used in similar health awareness studies among Nigerian adolescents (9, 13) and is further supported by reporting the continuous mean awareness score (4.00 ± 1.3 out of 7) to characterise the overall distribution.

Section C assessed perception of the effectiveness and reliability of AI platforms using seven items rated on a 4-

point Likert scale (Strongly Agree = 4, Agree = 3, Disagree = 2, Strongly Disagree = 1). The scale was intentionally designed without a neutral midpoint to elicit a definitive directional response from each participant. Sample items included: "AI platforms provide accurate and reliable HIV/AIDS information", "AI platforms protect user privacy during HIV/AIDS information seeking", and "I feel comfortable using AI platforms to learn about HIV/AIDS." A composite perception score was computed by summing responses across all seven items (range: 7–28; maximum possible score = 28). The mean composite perception score of the sample was [3.00 ± 0.92 out of 4.00]. Respondents with a total score at or above this mean were classified as having a positive perception; those below the mean were classified as having a negative perception. This scoring approach is grounded in the TAM framework, which identifies perceived usefulness and ease of use as determinants of technology acceptance (14, 15).

Section D assessed factors influencing acceptance and willingness to use AI technology for HIV/AIDS awareness using 15 Yes/No items grouped under six TAM-informed domains: Digital Access and Infrastructure, Platform Usability, Privacy and Trust, Perceived Usefulness, Intrinsic Motivation, and Social Influence. Each item used a Yes/No response format; "Yes" responses within each domain were summed and expressed as a percentage to indicate the proportion endorsing that factor as an influence on their acceptance.

Validity and Reliability

Validity was established through content and face validity. The questionnaire was reviewed by the project supervisor and a subject-matter expert (statistician) to assess the relevance, clarity, and comprehensiveness of items. Feedback obtained was used to refine item wording and structure before pilot testing.

Reliability of the instrument was established through a pilot study conducted among 30 students of Liberty Secondary School, Soyoye, Abeokuta South Local Government Area, Ogun State. The school was selected because it possessed characteristics like those of the study population, but was not included in the main study. Internal consistency was assessed using Cronbach's alpha coefficient. The awareness section (Section B) yielded a Cronbach's alpha of 0.81, while the perception section (Section C) had a Cronbach's alpha of 0.86. The overall instrument produced a Cronbach's alpha value of 0.84. Since all values exceeded the recommended threshold of 0.70, the instrument was considered reliable and suitable for the main study.

Data Analysis

Data were coded, entered, and analysed using Statistical Package for Social Sciences (SPSS) version 26. Descriptive statistics, including frequencies, percentages, and means, were used to summarise socio-demographic characteristics, awareness levels, perception scores, and acceptance factors.

This study employed descriptive analysis only, as the primary objective was to quantify and describe the level of awareness and perception of AI platforms among the study population, not to test hypotheses or examine causal associations. This approach is consistent with descriptive cross-sectional designs used in similar perception studies in Nigerian adolescent health research. However, it is acknowledged as a limitation that associations between sociodemographic variables and awareness or perception scores were not formally tested; future studies are encouraged to apply inferential analyses such as chi-square tests or logistic regression to identify predictors of positive perception.

Results

Socio-Demographic Characteristics

The response percentage was 98.2%, as 330 of the 336 distributed questionnaires were found to be suitable and complete. Six incomplete questionnaires (1.8%) were excluded using listwise deletion. Most of the respondents were 14–16 years of age (43.0%), followed by 10–13 years (36.4%), and 17–19 years (20.6%). Females constituted a slight majority (52.1%, n=172) compared to males (47.9%, n=158). Christians accounted for 57.3%, Muslims 39.7%, and Traditional/Others 3.0%. Regarding digital access, 84.2% had regular access to a smartphone, tablet, or computer; 59.4% used the internet daily; 73.0% had previously used a digital platform for learning; and 64.2% had received HIV/AIDS education in school (Table 1).

Table 1. Socio-demographic Characteristics of Respondents (n = 330)

Variable / Category	Frequency (f)	Percentage (%)
Age (years)		
10–13 years	120	36.4
14–16 years	142	43.0
17–19 years	68	20.6
Gender		
Male	158	47.9
Female	172	52.1
Religious Affiliation		
Christianity	189	57.3
Islam	131	39.7
Traditional/Others	10	3.0
Class Level		
JSS1–JSS3	145	43.9
SSS1–SSS3	185	56.1
Device Access (smartphone/tablet/computer)		
Yes	278	84.2
No	52	15.8
Internet Use Frequency		
Daily	196	59.4
Weekly	89	27.0
Occasionally	45	13.6
Ever Used a Digital Platform for Learning		
Yes	241	73.0
No	89	27.0
Received HIV/AIDS Education in School		
Yes	212	64.2
No	118	35.8

"Traditional/Others" refers to respondents who identified with Traditional African religion or other religious affiliations not listed above. Source: Field Survey, 2026

Level of Awareness of AI Interactive Platforms for HIV/AIDS Education

Table 2 presents respondents' awareness of AI interactive platforms for HIV/AIDS education. Overall, the level of awareness was moderate, with a mean of 4.00 (±1.3) "Yes" responses out of 7 items across the sample.

Most respondents (65.2%, n=215) had heard of Artificial Intelligence, and 219 (66.4%) were aware that AI platforms

can provide personalised HIV/AIDS information anonymously. Awareness that AI can provide real-time answers to health questions was reported by 204 respondents (61.8%), and 198 (60.0%) knew AI could be used for health education generally. However, awareness was notably lower for specific applications: only 172 (52.1%) were aware of AI's role in HIV/AIDS transmission and prevention education, and 187 (56.7%) had heard of specific AI tools

such as chatbots or virtual assistants. Actual prior use of AI-based platforms for health learning was the lowest of all items, reported by only 124 respondents (37.6%). Using a composite awareness score, respondents who answered "Yes" to four or more of the seven items (≥ 4 , equivalent to $\geq 57\%$) were classified as having high awareness, while those with fewer than four "Yes" responses were classified as having low awareness. This median-split cut-off is consistent with dichotomous awareness classification approaches used in similar health awareness

studies among Nigerian adolescents (9, 13). Based on this classification, 189 students (57.3%) demonstrated high awareness, and 141 (42.7%) demonstrated low awareness. The overall level of awareness was nonetheless characterised as moderate, as reflected by a mean awareness score of 4.00 ± 1.3 out of 7 items (57.1%), indicating that while more than half met the high awareness threshold, awareness of specific AI applications for HIV/AIDS education remained inconsistent across items, ranging from 37.6% (prior use) to 66.4% (awareness of anonymous information delivery).

Table 2: Level of Awareness of AI Interactive Platforms for HIV/AIDS Education (n = 330)

Item	Yes (%)	No (%)
Have you ever heard of Artificial Intelligence (AI)?	215 (65.2)	115 (34.8)
Are you aware that AI can be used for health education?	198 (60.0)	132 (40.0)
Have you heard of AI tools such as chatbots, virtual assistants, or educational apps?	187 (56.7)	143 (43.3)
Have you ever used any AI-based platform to learn about health topics?	124 (37.6)	206 (62.4)
Are you aware that AI can be used to teach about HIV/AIDS transmission and prevention?	172 (52.1)	158 (47.9)
AI platforms can provide real-time answers to health-related questions like HIV/AIDS	204 (61.8)	126 (38.2)
AI platforms can provide personalised HIV/AIDS information anonymously	219 (66.4)	111 (33.6)

Yes = 1, No = 0. Item score = proportion answering "Yes" (range: 0.00–1.00). Respondents answering "Yes" to four or more of seven items (≥ 4 , $\geq 57\%$ correct) were classified as having high awareness, consistent with the median-split dichotomous classification used in similar Nigerian adolescent health awareness studies (9, 13). The overall level of awareness across the sample was moderate (mean awareness score: 4.00 ± 1.3 out of 7 items, 57.1%). The term "moderate" describes the population-level awareness distribution; it is not a third classification category. Source: Field Survey, 2026

Perceptions Regarding Effectiveness and Reliability of AI Interactive Platforms

Table 3 below presents the frequency distribution, mean scores, and overall perception classification of students' responses regarding AI interactive platforms for HIV/AIDS education. Responses were recorded on a 4-point Likert scale (Strongly Agree = 4, Agree = 3, Disagree = 2, Strongly Disagree = 1). A mean score at or above the scale midpoint of 2.50 was used as the decision rule for classifying individual item perception as positive; the total mean was used to derive the overall sample classification (14, 15).

Students held positive perceptions across all seven items, with combined agreement (Strongly Agree + Agree) ranging from 71.5% to 77.9%. The highest-rated item was "AI interactive platforms make learning more engaging through quizzes or chats" (Mean = 3.10 ± 0.92 ; SA+A = 77.9%, n=257), indicating strong appreciation for interactive

learning features. This was followed by "AI can reliably answer HIV transmission questions without judgement, reducing stigma" (Mean = 3.03 ± 0.92 ; SA+A = 76.1%, n=251) and "AI platforms are more engaging than traditional classroom teaching" (Mean = 3.05 ± 0.93 ; SA+A = 76.4%, n=252). The lowest-rated item was "AI platforms would improve knowledge retention on HIV/AIDS better than pamphlets or talks" (Mean = 2.92 ± 0.92 ; SA+A = 71.5%, n=236), though this still exceeded the 2.50 decision threshold, reflecting positive perception.

The total mean perception score was 3.00 ± 0.92 out of 4.00, with all seven items exceeding the 2.50 scale midpoint, confirming an overall positive perception of AI platforms for HIV/AIDS awareness. Overall, 224 students (67.9%) were classified as having positive perceptions, while 106 (32.1%) expressed negative perceptions.

Table 3: Perceptions Regarding Effectiveness and Reliability of AI Platforms (n = 330)

Statement	SA(%)	A (%)	D (%)	SD (%)	SA+A (%)	MEAN	Standard Deviation	Decision
AI platforms would deliver accurate and trustworthy information on HIV/AIDS compared to traditional lectures.	98 (29.7)	142 (43.0)	62 (18.8)	28 (8.5)	240 (72.7%)	2.94	0.91	Positive
AI tools facilitate understanding of HIV/AIDS and offer confidential health information.	112 (33.9)	135 (40.9)	53 (16.1)	30 (9.1)	247 (74.8%)	3.00	0.93	Positive
AI platforms are more engaging than traditional classroom teaching.	124 (37.6)	128 (38.8)	49 (14.8)	29 (8.8)	252 (76.4%)	3.05	0.93	Positive

AI platforms contribute to the correction of HIV/AIDS misconceptions.	105 (31.8)	139 (42.1)	58 (17.6)	28 (8.5)	244 (73.9%)	2.97	0.91	Positive
AI interactive platforms make learning more engaging through quizzes or chats.	131 (39.7)	126 (38.2)	47 (14.2)	26 (7.9)	257 (77.9%)	3.10	0.92	Positive
AI can reliably answer HIV transmission questions without judgment, reducing stigma.	118 (35.8)	133 (40.3)	51 (15.5)	28 (8.5)	251 (76.1%)	3.03	0.92	Positive
AI platforms would improve knowledge retention on HIV/AIDS better than pamphlets or talks.	96 (29.1)	140 (42.4)	64 (19.4)	30 (9.1)	236 (71.5%)	2.92	0.92	Positive
Total Mean / Overall					224 (67.9)	3.00	0.92	Positive

Likert scale: SA=4, A=3, D=2, SD=1. Decision rule: Item mean ≥ 2.50 (scale midpoint) = Positive perception; item mean < 2.50 = Negative perception. Overall perception classification: positive if individual composite score (sum of 7 items) ≥ 21.00 (3.00 × 7); negative if < 21.00. The 4-point scale intentionally omits a neutral option to elicit definitive directional responses; this is acknowledged as a study limitation Source: Field Survey, 2026

Factors Influencing Acceptance and Willingness to Use AI for HIV/AIDS Awareness

The findings revealed a generally high level of acceptance and willingness, with positive responses ranging from 71.2% (Social Influence) to 85.8% (Digital Access and Infrastructure) across six domains (14). Digital Access and

Infrastructure emerged as the strongest influencing factor (85.8%), followed by Privacy, Trust, and Ethical Concerns (84.2%), Platform Usability and User Experience (82.7%), Intrinsic Motivation (81.5%), Perceived Usefulness and Educational Value (78.5%), and Social Influence (71.2%).

Table 4: Factors Influencing Acceptance and Willingness to Use AI for HIV/AIDS Awareness (n = 330)

Category (Key Items)	TAM Construct	Number of Items	Yes (%)	No (%)
A) Intrinsic Motivation (curiosity, confidence, excitement)	Attitude toward Use	3	269 (81.5)	61 (18.5)
B) Social Influence (friends, teachers, classmates)	Subjective Norm	3	235 (71.2)	95 (28.8)
C) Digital Access and Infrastructure (phone, internet, school facilities)	Facilitating Conditions	3	283 (85.8)	47 (14.2)
D) Platform Usability and User Experience (easy interface, voice, pictures)	Perceived Ease of Use	2	273 (82.7)	57 (17.3)
E) Perceived Usefulness and Educational Value (better than notes/videos)	Perceived Usefulness	2	259 (78.5)	71 (21.5)
F) Privacy, Trust, and Ethical Concerns (private questions, accurate facts)	Trust/Perceived Risk	2	278 (84.2)	52 (15.8)

Overall willingness (66.4%) was derived from a separate direct-response item asking respondents whether they would use an AI platform for HIV/AIDS education if made available. Domain-specific endorsement rates ranged from 71.2% (Social Influence) to 85.8% (Digital Access and Infrastructure). Source: Field Survey, 2026

Discussion

This study assessed the awareness, perceptions, and acceptance factors of AI interactive platforms for HIV/AIDS awareness among students in selected private secondary schools in Abeokuta North, Ogun State, Nigeria. The findings are discussed in relation to existing literature and the Technology Acceptance Model (TAM) framework (14, 15). The overall level of awareness of AI interactive platforms for HIV/AIDS education was moderate, with a mean awareness score of 4.00 ± 1.3 out of 7 (57.1%), and 189 students (57.3%) demonstrated high awareness (≥4 correct Yes responses out of 7; mean = 4.00 ± 1.3), though the overall

level of awareness was characterised as moderate given that awareness of specific AI applications for HIV/AIDS education remained inconsistent across items, ranging from 37.6% (prior use) to 66.4% (awareness of anonymous information delivery) (9, 16). This gap between conceptual awareness and practical experience is consistent with findings from similar low- and middle-income country settings, where limited formal integration of AI health tools into secondary school curricula has been identified as a key barrier to uptake. To the best of the authors' knowledge, no published study has specifically quantified the awareness of AI interactive platforms for HIV/AIDS awareness among

Nigerian secondary school students, representing a critical evidence gap given that Nigeria accounts for a disproportionate share of adolescent HIV infections in sub-Saharan Africa (12). The moderate awareness observed likely reflects the relatively better digital infrastructure of private schools rather than deliberate curricular integration of AI health tools; awareness levels in public schools, where over 85% of Nigerian secondary school students are enrolled, may be considerably lower (8).

Students demonstrated largely positive perceptions of AI interactive platforms, with a total mean perception score of 3.00 ± 0.92 out of 4.00 and 67.9% classified as having positive perceptions. The highest agreement was recorded for interactive engagement through quizzes and chats (77.9%), the non-judgemental and stigma-reducing nature of AI interactions (76.1%), and AI's ability to correct HIV/AIDS misconceptions (73.9%). These findings align with Ni et al. (5), who reported that adolescent girls and young women in Cameroon highly valued the anonymity and interactivity of AI platforms for HIV prevention, and with Mulyaningsih et al. (17), whose systematic review confirmed positive adolescent perceptions of AI tools for sexually transmitted infection education across low- and middle-income countries. The findings are further consistent with van Heerden et al. (18), who identified trustworthiness and accuracy as primary drivers of chatbot engagement in HIV services. While direct comparison with these studies is limited by population differences, the Cameroonian study involved adolescent girls and young women in community settings (5), and several reviewed studies involved college students with greater levels of digital autonomy and independence (17, 18), the convergent finding of strongly positive attitudes toward AI for HIV/AIDS information suggests that this pattern may reflect a broader generational openness to digital health tools among young people in low- and middle-income countries.

Critically, the awareness-perception gap observed, whereby fewer than half (57.3% high awareness overall, yet 67.9% held positive perceptions), suggests that students' favourable attitudes are largely driven by perceived potential around anonymity and interactivity rather than lived experience with these tools (14, 15). This pattern is well-documented in TAM-based adoption research, where positive attitudes frequently precede and motivate actual use (14, 15). However, it also carries a risk: perceptions formed in the absence of direct experience may shift once students encounter real-world limitations such as unreliable internet connectivity or inaccurate AI-generated content. The comparatively lower mean score for knowledge retention (Mean = 2.92 ± 0.92) further suggests that some students continue to value conventional instruction, underscoring the need for hybrid models that integrate AI tools with teacher-led classroom delivery rather than replacing traditional approaches entirely (7, 19).

Regarding acceptance, domain-specific endorsement rates ranged from 71.2% to 85.8%, with an overall willingness to

use AI for HIV/AIDS education of 66.4%. Applying the TAM framework (14, 15), Digital Access and Infrastructure (85.8%) corresponds to facilitating conditions; Platform Usability (82.7%) reflects Perceived Ease of Use; Perceived Usefulness and Educational Value (78.5%) align with TAM's core Perceived Usefulness construct; and Intrinsic Motivation (81.5%) maps onto Attitude toward Use. Privacy, Trust, and Ethical Concerns (84.2%) ranked as the second strongest factor, consistent with Peng et al (20). and van Heerden et al. (18), who identified confidentiality as a primary determinant of AI chatbot acceptance among adolescents seeking HIV-related information, a finding particularly salient in the Nigerian context, where HIV-related stigma remains a well-documented barrier to adolescent help-seeking behaviour (21, 22). Social Influence recorded the lowest endorsement of all six domains (71.2%), though still above two-thirds of respondents. This finding is consistent with Kelly and Palaniappan (23), who identified subjective norm as the weakest TAM predictor in a Ghanaian youth technology adoption study. The lower endorsement likely reflects the novelty of AI-based health education in Nigerian secondary schools, where peer modelling and teacher recommendation for such tools are not yet established social norms (24). Unlike mobile phones and social media, which carry strong peer influence among adolescents, AI platforms for HIV/AIDS awareness represent an unfamiliar application with limited collective exposure within the school environment (25).

These findings carry direct implications for curriculum design and health education programming in Nigeria. First, the low hands-on use (37.6%) despite positive perceptions indicates that structured opportunities for students to interact with AI health tools must be formally incorporated into the school curriculum, for example, through dedicated ICT health education modules within the existing HIV/AIDS and reproductive health curriculum in JSS and SSS classes. This aligns with evidence from Mathur et al. (24), who demonstrated the feasibility and acceptability of a digital chatbot for HIV prevention in Nigeria, confirming that such tools can be contextualised effectively for Nigerian populations, and is further supported by the broader literature on adolescent digital health interventions (26, 27). Second, given that digital access (85.8%) and platform usability (82.7%) were the strongest acceptance drivers, investment in reliable internet infrastructure and student device access in schools is a prerequisite for any AI-based health education programme (8). Third, the high endorsement of privacy and trust (84.2%) underscores that any deployed AI platform must clearly communicate its data protection and confidentiality features to students (20). Fourth, the lower social influence score points to the need for teacher training programmes and peer champion models that normalise AI health tools within the school social environment (24, 28). The growing evidence base on digital health interventions for HIV in Nigeria and similar settings further supports the feasibility of this approach (29, 30).

Study Limitations

This study was conducted exclusively in private secondary schools, which typically have better digital infrastructure and higher socioeconomic profiles than public schools; findings are therefore not generalisable to the broader Nigerian secondary school population (8). Additionally, descriptive analysis only was employed; associations between sociodemographic variables and awareness or perception levels were not formally tested, and future studies should apply inferential analyses such as chi-square tests or logistic regression (9). The use of a 4-point Likert scale without a neutral option may have directed responses toward agreement, potentially inflating positive perception scores (14). Finally, the cross-sectional design precludes causal inference; longitudinal studies are needed to assess whether positive perceptions translate into sustained AI platform use for HIV/AIDS awareness and education

Conclusion

Students in selected private secondary schools in Abeokuta North demonstrated moderate overall awareness (mean = 4.00 ± 1.3 out of 7; 57.3% high awareness) and largely positive perceptions (total mean = 3.00 ± 0.92 out of 4.00; 67.9% positive) of AI interactive platforms for HIV/AIDS education, with high overall willingness to adopt such tools (66.4%) when digital access, privacy, and platform usability are assured. To the best of the authors' knowledge, this study is the first to quantify these outcomes among Nigerian secondary school students, addressing a critical evidence gap (12). Integration of AI tools into school health curricula, supported by adequate ICT infrastructure, teacher training, and peer champion models, could significantly enhance HIV prevention education among Nigerian adolescents (24, 26). However, as findings are drawn from private schools with relatively better digital resources, validation in public and rural school settings is essential before broader policy application (8).

Abbreviations

AI: Artificial Intelligence
AR: Augmented Reality
HIV: Human Immunodeficiency Virus
AIDS: Acquired Immunodeficiency Syndrome
ICT: Information and Communication Technology
JSS: Junior Secondary School
SSS: Senior Secondary School
LGA: Local Government Area
NACA: National Agency for the Control of AIDS
NGO: Non-Governmental Organisation
SPSS: Statistical Package for the Social Sciences
STI: Sexually Transmitted Infection
TAM: Technology Acceptance Model
UNAIDS: Joint United Nations Programme on HIV/AIDS
WHO: World Health Organisation

Declarations

Ethics Approval and Consent to Participate: Ethical approval for the study was obtained from the Educational, Planning, Research and Statistics Department of the Ministry of Education, Science, and Technology, Abeokuta, Ogun State (Ref.no: PL.545/Vol/VT1/44). A formal proposal was submitted through the Department of Nursing, Crescent University, Abeokuta, after obtaining approval from the research supervisor. Participation in the study was voluntary, and written informed consent was obtained from all respondents. Confidentiality and anonymity of participants were ensured, as no personal identifying information was collected.

Data Availability: Available upon request.

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