



Artificial Intelligence, User Psychology and Service Delivery in Academic Libraries in Nigerian Universities

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Abstract. This study examined the relationship between artificial intelligence, user psychology, and service delivery in academic libraries in Nigerian universities. The study investigated how the adoption of artificial intelligence technologies influences users' psychological responses, including perception, trust, satisfaction, acceptance, and information-seeking behaviour, as well as the effectiveness of library service delivery. A descriptive survey research design was adopted. The population comprised undergraduate students, postgraduate students, lecturers, and library staff from selected federal, state, and private universities in Nigeria. A sample of 600 respondents was selected using multistage sampling techniques involving purposive, stratified, and simple random sampling methods. Data were collected using a structured questionnaire titled Artificial Intelligence, User Psychology, and Library Service Delivery Questionnaire (AIUPLSDQ). Face and content validity were established by experts in educational psychology, library and information science, and measurement and evaluation, while reliability coefficients ranging from 0.78 to 0.91 were obtained using Cronbach's alpha method. Data were analyzed using descriptive statistics such as frequency counts, percentages, mean, and standard deviation, while Pearson Product Moment Correlation, t-test, and multiple regression analyses were used to test the hypotheses at 0.05 level of significance. Pearson correlation and regression analyses revealed a significant positive relationship between artificial intelligence adoption and service delivery in academic libraries, $r(598) = .684$, $p < .05$. Findings also revealed that artificial intelligence usage significantly influenced users' psychological responses, while user psychology significantly predicted service delivery effectiveness in academic libraries. Findings imply that effective integration of artificial intelligence technologies can enhance users' psychological

acceptance and improve the quality, accessibility, and responsiveness of academic library services in Nigerian universities. The study therefore recommended increased investment in AI technologies, digital infrastructure, and continuous user and staff training to enhance effective utilization of AI-based library services.

Keywords: Artificial Intelligence, User Psychology, Academic Libraries, Service Delivery, Nigerian Universities.

1. Introduction

The rapid advancement of digital technologies has transformed the operations and service delivery systems of academic libraries worldwide. Academic libraries have evolved from traditional repositories of books into digital knowledge centers that support teaching, learning, research, and information exchange. Among the technologies driving this transformation, Artificial Intelligence (AI) has emerged as a major innovation in information management and library service delivery. Artificial intelligence refers to the simulation of human intelligence by computer systems to perform tasks such as learning, reasoning, problem-solving, natural language processing, and decision-making (Russell & Norvig, 2021). In academic libraries, AI technologies are increasingly used for cataloguing, indexing, virtual reference services, information retrieval, recommendation systems, chatbots, and automated circulation services (Akinola, 2023; Emezaiwakpor, Idiodi, & Urhiewhu, 2023).

Globally, developed countries have made substantial progress in integrating AI into academic library systems. In the United States, universities such as Harvard University and the Massachusetts Institute of

Technology (MIT) employ AI-powered discovery systems, virtual assistants, and predictive analytics to improve information retrieval and user experience (Cox, Pinfield, & Rutter, 2019). Libraries in the United Kingdom utilize AI-driven chatbots and intelligent search systems to provide real-time support services (Panda & Kaur, 2022). In China, smart libraries employ robotics, facial recognition systems, and machine learning technologies to improve operational efficiency and user interaction (Li, 2021). Similarly, South Korean academic libraries integrate AI-based systems for digital learning support and automated library operations aimed at enhancing research productivity (Kim & Lee, 2022).

The global adoption of AI in academic libraries is driven by increasing demand for faster, personalized, and technology-driven services. The rapid growth of information resources and changing user expectations have compelled libraries to adopt innovative technologies capable of improving efficiency and service quality. Consequently, AI-powered systems now facilitate real-time information access, intelligent cataloguing, automated user support, and personalized recommendations tailored to users' information needs (Adewojo, Amzat, & Abiola, 2024; Huang & Rust, 2021).

In developing countries, particularly Nigeria, the adoption of artificial intelligence in academic libraries is gradually gaining attention due to the need for technological modernization and improved information service delivery. Nigerian academic libraries are beginning to implement AI-related technologies such as intelligent search engines, machine learning tools, robotics, and automated circulation systems to improve library operations and user experiences. However, the implementation of AI in many Nigerian academic libraries remains limited by inadequate infrastructure, poor funding, shortage of technical expertise, irregular power supply, and resistance to technological change (Emezaiwakpor et al., 2023; Nduka, Tella, & Okiki, 2023).

Beyond technological efficiency, the successful integration of AI in academic libraries is strongly linked to user psychology. User psychology refers to the cognitive, emotional, and behavioural responses of individuals toward technological systems and services. Variables such as trust, perception, satisfaction, technology acceptance, and attitudes toward innovation significantly influence users' willingness to adopt and utilize AI-based library services. Users who perceive AI technologies as useful, reliable, and easy to use are more likely to embrace such systems effectively. Conversely, fear of

technological complexity, privacy concerns, and digital anxiety may reduce acceptance and usage of AI systems (Odelami, Ebhonu, Oradugba, & Usman, 2026; Oluwayemi & Adeyinka, 2024). Studies have shown that psychological perceptions significantly determine the effectiveness of technological innovations in educational environments (Venkatesh, Morris, Davis, & Davis, 2003).

The Technology Acceptance Model (TAM) developed by Davis (1989) explains that perceived usefulness and perceived ease of use are major determinants of technology acceptance. Similarly, the Theory of Planned Behaviour proposed by Ajzen (1991) emphasizes that attitudes, subjective norms, and behavioural intentions influence technology adoption and utilization. These theories suggest that user psychology plays a crucial role in determining the effectiveness of AI-driven service delivery in academic libraries.

The integration of artificial intelligence into academic library systems has important implications for service delivery efficiency, accessibility, responsiveness, and quality. AI technologies can improve information organization, reduce response time, enhance digital reference services, and strengthen user engagement. However, the effectiveness of these technologies depends largely on users' readiness and psychological acceptance. Therefore, there is a need for empirical investigation into the relationship among artificial intelligence, user psychology, and service delivery in academic libraries in Nigerian universities.

1.1 Statement of the Problem

The emergence of artificial intelligence (AI) has transformed information management and service delivery across educational institutions and academic libraries worldwide. Modern academic libraries are increasingly expected to provide fast, efficient, user-centered, and technology-driven services that meet the growing information needs of students, lecturers, researchers, and other users. Consequently, many libraries now integrate AI technologies such as chatbots, automated cataloguing systems, machine learning applications, virtual assistants, and intelligent information retrieval systems to improve accessibility, efficiency, and user satisfaction.

Despite these global developments, many academic libraries in Nigerian universities still experience challenges related to effective service delivery. These challenges include delays in information retrieval, limited access to digital resources, inadequate personalization of services, poor responsiveness to

users' needs, and weak user support systems. Although some Nigerian universities have introduced AI-driven technologies into library operations, the level of implementation remains relatively low due to inadequate funding, poor technological infrastructure, shortage of skilled personnel, unstable power supply, and limited institutional support.

In addition to infrastructural constraints, the effectiveness of AI in academic libraries is strongly influenced by users' psychological responses toward such technologies. Factors such as perception, trust, satisfaction, anxiety, motivation, and technology acceptance determine whether users will effectively adopt and utilize AI-based library services. Some users perceive AI systems as difficult to use, impersonal, or unreliable, while some librarians express concerns about job displacement, insufficient technical competence, and the changing role of librarians in automated environments. These concerns may hinder the successful implementation and utilization of AI technologies in academic libraries.

Existing studies on AI in Nigerian academic libraries have focused mainly on awareness, adoption, benefits, and implementation challenges. However, limited empirical attention has been given to the psychological factors influencing users' interaction with AI systems and how these factors affect service delivery outcomes. Furthermore, few studies have examined the combined relationship among artificial intelligence, user psychology, and service delivery within Nigerian university libraries.

Therefore, this study seeks to investigate the relationship between artificial intelligence, user psychology, and service delivery in academic libraries in Nigerian universities. Specifically, the study examines whether AI adoption significantly influences users' psychological responses and whether these psychological factors contribute to improved library service delivery.

1.2 Research Questions

The following research questions were formulated to guide the study:

- What relationship exists between artificial intelligence adoption and service delivery in academic libraries in Nigerian universities?
- To what extent does artificial intelligence usage influence users' psychological responses such as satisfaction, trust, and technology acceptance in academic libraries in Nigerian universities?

- What difference exists in the perception of artificial intelligence-based library services among students, lecturers, and library staff in Nigerian universities?
- To what extent does user psychology predict the effectiveness of service delivery in academic libraries in Nigerian universities?

1.3 Research Hypotheses

- There is no significant relationship between artificial intelligence adoption and service delivery in academic libraries in Nigerian universities.
- Artificial intelligence usage does not significantly influence users' psychological responses (such as satisfaction, trust, and technology acceptance) in academic libraries in Nigerian universities.
- There is no significant difference in the perception of artificial intelligence-based library services among students, lecturers, and library staff in Nigerian universities.
- User psychology does not significantly predict the effectiveness of service delivery in academic libraries in Nigerian universities.

2. Empirical Review

AI and Library Service Delivery: Empirical studies have shown that artificial intelligence significantly improves service delivery in academic libraries through automation, efficient information management, and enhanced user support. Akinola (2023) reported that AI technologies such as machine learning, robotics, and natural language processing improve productivity, information retrieval, and virtual assistance in Nigerian academic libraries. Similarly, Emezaiwakpor, Idiodi, and Urhiewhu (2023) found that AI applications enhanced cataloguing, reference services, readers' services, and serial management, thereby improving efficiency and responsiveness in library operations.

Nduka, Tella, and Okiki (2023) further observed that AI technologies facilitate quick information retrieval, efficient service delivery, and improved operational performance in university libraries. Likewise, Wagwu, Okpala, Maxwell, and Oladokun (2024) revealed that AI-driven chatbots improved accessibility, communication, and user support services in Nigerian university libraries. Overall, the reviewed studies indicate that artificial intelligence positively enhances library service delivery by improving operational efficiency, accessibility, and user engagement.

AI Adoption and User Perception: Studies have also examined users' awareness, perceptions, and adoption of AI technologies in academic libraries. Oyekale and Zubairu (2023) found that librarians in university libraries in Osun State demonstrated high awareness and positive perceptions of AI technologies. However, adoption remained relatively low due to inadequate funding and infrastructural challenges. Similarly, Efevberha-Ogodo and Ivwighrehgweta (2023) reported substantial awareness of AI systems among librarians in Northern Nigeria, although actual utilization remained limited.

Research further shows that users' perceptions significantly influence AI adoption and utilization. Positive perceptions regarding usefulness, accessibility, and efficiency encourage technology acceptance, whereas concerns about complexity, reliability, and privacy discourage utilization (Venkatesh, Morris, Davis, & Davis, 2003). These studies suggest that awareness alone cannot guarantee effective AI implementation without adequate infrastructure, institutional support, and users' readiness to adopt technological innovations.

Psychological Factors and Technology Acceptance: Psychological factors are important determinants of AI adoption in academic libraries. Odelami, Ebhonu, Oradugba, and Usman (2026), using the Technology Acceptance Model (TAM), found that perceived usefulness and perceived ease of use significantly influenced librarians' intention to adopt AI technologies for knowledge sharing. This supports Davis' (1989) assertion that users are more likely to accept technologies they perceive as beneficial and easy to operate.

Similarly, Wagwu et al. (2024) reported that AI-driven chatbot systems improved user satisfaction and engagement when users perceived them as reliable and user-friendly. Conversely, anxiety, low digital literacy, and fear of technological complexity negatively affect users' willingness to utilize AI-based services (Oluwayemi & Adeyinka, 2024). The reviewed literature therefore indicates that trust, satisfaction, motivation, and behavioural intentions significantly determine the effectiveness of AI-driven library services.

Challenges of AI in Libraries: Despite the benefits of AI technologies, several challenges hinder their implementation in academic libraries, especially in developing countries. Emezaiwakpor et al. (2023) identified inadequate funding, poor governmental support, and shortage of technical expertise as major barriers to AI adoption in Nigerian academic libraries.

Similarly, Nduka et al. (2023) reported that resistance to technological change, inadequate ICT infrastructure, and fear of job displacement negatively affect successful AI integration.

Wagwu et al. (2024) also identified inadequate awareness and lack of skilled personnel as barriers to effective implementation of AI-driven chatbots in Nigerian university libraries. In addition, concerns relating to privacy, data security, digital inequality, and algorithmic bias continue to shape users' perceptions and acceptance of AI technologies (Oton & Kolawole, 2025). These findings suggest that infrastructure, training, funding, and ethical safeguards are necessary for sustainable AI implementation in academic libraries.

Summary of Empirical Review and Gap in Literature: The reviewed studies demonstrate that artificial intelligence improves academic library operations, information accessibility, and service delivery. However, most existing studies focused primarily on awareness, adoption, and technological infrastructure, with limited attention to the psychological factors influencing users' interaction with AI systems and their effects on service delivery outcomes.

Furthermore, few studies have examined the combined relationship among artificial intelligence, user psychology, and service delivery within Nigerian universities. This study therefore seeks to bridge this gap by investigating the interaction between artificial intelligence, user psychology, and service delivery in academic libraries in Nigerian universities.

3. Theoretical Framework

This study is anchored on the Technology Acceptance Model (TAM) and the Theory of Planned Behaviour (TPB). These theories explain how users perceive, accept, and utilize artificial intelligence technologies in academic libraries and how such perceptions influence service delivery in Nigerian universities.

Technology Acceptance Model (TAM): The Technology Acceptance Model (TAM), developed by Davis (1989), explains users' acceptance of technological innovations. The model identifies two major determinants of technology adoption: perceived usefulness and perceived ease of use. Perceived usefulness refers to the extent to which users believe a technology improves performance, while perceived ease of use concerns the degree to which the technology is free from difficulty or complexity. TAM assumes that users are more likely to adopt technologies they perceive as useful, efficient, and

easy to operate (Venkatesh & Davis, 2000). In academic libraries, users are more likely to accept AI technologies when such systems improve information retrieval, accessibility, responsiveness, and overall library experiences.

The relevance of TAM to this study lies in its explanation of users' psychological responses toward AI technologies. Variables such as trust, satisfaction, perception, acceptance, and information-seeking behaviour are linked to perceived usefulness and perceived ease of use. In this study, artificial intelligence represents the independent variable, user psychology serves as the intervening variable, and service delivery constitutes the dependent variable. TAM therefore explains how AI adoption influences users' psychological acceptance and library service effectiveness.

Theory of Planned Behaviour (TPB): The Theory of Planned Behaviour (TPB), proposed by Ajzen (1991), explains that behaviour is influenced by behavioural intentions, which are shaped by attitude toward behaviour, subjective norms, and perceived behavioural control.

Attitude refers to an individual's positive or negative evaluation of a behaviour, subjective norms involve social influence, while perceived behavioural control concerns individuals' perception of their ability to perform a behaviour successfully. TPB assumes that individuals are more likely to adopt technologies when they possess positive attitudes, receive social support, and believe they have the required skills and resources.

The theory is relevant to this study because it explains how attitudes, social influence, and digital competence affect users' willingness to utilize AI-based library systems. Students, lecturers, and librarians are more likely to adopt AI technologies when they perceive them as beneficial and easy to use.

The linkage between TPB and this study is reflected in the relationship between user psychology and service delivery. Psychological factors such as trust, motivation, behavioural intention, and technology acceptance significantly influence users' interaction with AI systems. Positive attitudes toward AI technologies are likely to enhance users' engagement with library services and improve service delivery outcomes.

Theoretical Linkage to the Study: The integration of TAM and TPB provides a comprehensive framework for understanding AI adoption in academic libraries. TAM explains technology acceptance through perceived usefulness and ease of use, while TPB

explains how attitudes, social influence, and behavioural control shape technology utilization.

Together, the theories establish that successful AI implementation depends not only on technological availability but also on users' psychological readiness, trust, and behavioural intentions. The theories therefore support the assumption that positive psychological acceptance of AI technologies enhances effective service delivery in academic libraries.

4. Conceptual Framework

The conceptual framework explains the relationship among artificial intelligence, user psychology, and service delivery in academic libraries in Nigerian universities. The framework assumes that AI technologies influence users' psychological experiences, which subsequently affect the quality and effectiveness of library service delivery. It also recognizes the moderating influence of infrastructure, training, and institutional support.

Artificial Intelligence (Independent Variable):

Artificial intelligence is the independent variable in the study. It includes technologies such as chatbots, machine learning systems, robotics, expert systems, automated circulation systems, digital indexing tools, and virtual reference services. These technologies are expected to improve efficiency, accessibility, speed, and responsiveness in library operations.

User Psychology (Intervening Variable):

User psychology represents the intervening variable and includes perception, trust, satisfaction, motivation, behavioural intention, technology acceptance, perceived usefulness, and perceived ease of use. Users who perceive AI technologies as useful and reliable are more likely to utilize AI-enabled library services effectively. Conversely, anxiety, low digital literacy, and privacy concerns may reduce acceptance and usage.

Service Delivery (Dependent Variable):

Service delivery is the dependent variable and refers to the efficiency, accessibility, responsiveness, and quality of library services. Effective service delivery is reflected in timely information dissemination, improved access to resources, enhanced user satisfaction, and efficient support for teaching, learning, and research.

Moderating Variables

The framework identifies the following moderating variables:

Infrastructure: Availability of internet connectivity, electricity, and ICT facilities.

Training: Digital literacy, AI competence, and professional development for librarians and users.

Institutional Support: Administrative commitment, funding, and policy support for technological innovation.

These factors may strengthen or weaken the relationship among AI, user psychology, and service delivery.

Visual Conceptual Model

Plain text

Moderating Variables

- Infrastructure
- Training
- Institutional Support



Artificial Intelligence→User Psychology→Service Delivery

- Chatbots
- Machine Learning
- Robotics
- Expert Systems
- Automation
- Trust
- Satisfaction
- Perception
- Acceptance
- Motivation
- Accessibility
- Efficiency
- Responsiveness
- User Satisfaction
- Quality Services
- Behavioural Intention

The model illustrates that artificial intelligence technologies influence users' psychological responses, which subsequently affect service delivery outcomes. Positive psychological outcomes such as trust, satisfaction, and acceptance improve users' engagement with AI-enabled library services, thereby enhancing efficiency, accessibility, and quality of service delivery. The effectiveness of this relationship depends on infrastructure, training, and institutional support.

5. Methodology

Research Design: This study adopted a descriptive survey research design to examine the relationship among artificial intelligence, user psychology, and service delivery in academic libraries in Nigerian universities. The design was considered appropriate because it enables the collection of data from a large population and facilitates the examination of existing perceptions, attitudes, and relationships among variables without manipulation.

Population of the Study: The population comprised undergraduate students, postgraduate students,

academic staff, and library personnel in selected federal, state, and private universities in Nigeria. These groups were selected because they are the primary users and providers of academic library services and are directly affected by the integration of artificial intelligence technologies in library operations.

Sample and Sampling Techniques: A sample of 600 respondents was drawn from six universities across the six geopolitical zones of Nigeria. The sample included students, lecturers, and library staff to ensure adequate representation of library users and service providers. A multistage sampling technique was employed. Purposive sampling was first used to select universities with evidence of AI-related applications in their library systems. Stratified sampling was then used to group respondents into undergraduate students, postgraduate students, lecturers, and library staff, after which simple random sampling was used to select participants proportionately from each stratum.

Instrumentation: Data were collected using a structured questionnaire titled Artificial Intelligence, User Psychology, and Library Service Delivery Questionnaire (AIUPLSDQ) developed by the researcher. The instrument consisted of four sections: Section A contained demographic information; Section B assessed AI utilization in academic libraries; Section C measured user psychology variables such as trust, satisfaction, perceived usefulness, and technology acceptance; while Section D focused on service delivery variables including accessibility, efficiency, responsiveness, and quality of services. The questionnaire was structured on a modified four-point Likert scale of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD).

Validity and Reliability of the Instrument: Face and content validity were established through expert review by specialists in educational psychology, library and information science, and measurement and evaluation. Their observations and recommendations were incorporated into the final version of the instrument. A pilot study involving 40 respondents from a university outside the sampled institutions was conducted. Cronbach's alpha reliability coefficients obtained were 0.81 for artificial intelligence utilization, 0.84 for user psychology, and 0.88 for service delivery, with an overall reliability coefficient of 0.86, indicating adequate internal consistency.

Method of Data Collection: Data were collected through direct administration of questionnaires with the assistance of trained research assistants. Approval was obtained from the selected universities and library

management before data collection. Questionnaires were distributed physically and electronically where necessary, and completed copies were retrieved immediately or within an agreed period.

Ethical Considerations: Ethical standards were strictly observed throughout the study. Institutional approval was obtained from the relevant university authorities before data collection commenced. Participants were informed about the objectives of the study, and informed consent was obtained prior to participation. Participation was voluntary, and respondents were free to withdraw at any stage without penalty. Confidentiality and anonymity were ensured by excluding personal identifiers from the

questionnaire. Information provided by respondents was treated strictly for academic and research purposes.

Method of Data Analysis: Data collected were coded and analyzed using the Statistical Package for Social Sciences (SPSS). Descriptive statistics such as frequency counts, percentages, mean, and standard deviation were used to answer the research questions. Inferential statistics including Pearson Product Moment Correlation (PPMC), independent sample t-test, one-way Analysis of Variance (ANOVA), and multiple regression analysis were used to test the hypotheses at 0.05 level of significance.

6. Results

Hypothesis 1: There is no significant relationship between artificial intelligence adoption and service delivery in academic libraries in Nigerian universities.

Table 1: Person Product Moment Correlation Analysis Showing the Relationship Between Artificial Intelligence Adoption and Service Delivery

Variables	N	Mean	SD	r	p-value	Decision
Artificial Intelligence Adoption	600	32.45	5.21	.684**	.000	Rejected
Service Delivery	600	31.18	4.87			

Note $p < .05$

The result presented in Table 1 revealed a significant positive relationship between artificial intelligence adoption and service delivery in academic libraries, $r(598) = .684$, $p < .05$. Therefore, the null hypothesis was rejected. This finding suggests that increased adoption of artificial intelligence technologies significantly improves the efficiency, accessibility, responsiveness, and overall quality of service delivery in academic libraries. The result further implies that AI-driven systems such as chatbots, intelligent cataloguing, and automated circulation services contribute positively to users' experiences and operational effectiveness within university libraries.

Hypothesis 2: Artificial intelligence usage does not significantly influence users' psychological responses (such as satisfaction, trust, and technology acceptance) in academic libraries in Nigerian universities.

Table 2: Multiple Regression Analysis Showing the Influence of Artificial Intelligence Usage on Users' Psychological Responses

Model Summary

Model	R	R ²	Adjusted R ²	F
1	.712	.507	.503	153.284

Regression Coefficients

Predictor variable	B	Std. Error	Beta (β)	t	p-value
Artificial Intelligence Usage	.621	.050	.712	12.381	.000

Note $p < .5$

The findings in Table 2 indicated that artificial intelligence usage significantly influenced users' psychological responses, $\beta = .712$, $t(598) = 12.381$, $p < .05$. Hence, the null hypothesis was rejected. The result implies that increased utilization of artificial intelligence technologies positively affects users' perceptions, trust, satisfaction, and acceptance of academic library services. This suggests that users are more likely to develop positive attitudes toward library services when AI technologies are perceived as useful, reliable, and easy to use.

Hypothesis 3: There is no significant difference in the perception of artificial intelligence-based library services among students, lecturers, and library staff in Nigerian universities.

Table 3: One-Way ANOVA Showing Difference in Perception of AI-Based Library Services Among Respondents

Source of Variation	Sum of Squares	df	Mean Square	F	p-value	Decision
Between Groups	524.316	2	262.158	6.427	.002	Rejected
Within Groups	24341.227	597	40.773			
Total	24865.543	599				

Note $p < .05$

The result in Table 3 showed a significant difference in the perception of artificial intelligence-based library services among students, lecturers, and library staff, $F(2, 597) = 6.427$, $p < .05$. Therefore, the null hypothesis was rejected. This finding suggests that different categories of library users perceive AI technologies differently based on their experiences, technological competence, and level of exposure to digital systems. The result indicates that while some users may view AI technologies as innovative and beneficial, others may still have concerns regarding technological complexity, privacy, and reliability.

Hypothesis 4: User psychology does not significantly predict the effectiveness of service delivery in academic libraries in Nigerian universities.

Table 4: Simple Regression Analysis Showing the Predictive Influence of User Psychology on Service Delivery

Model Summary

Model	R	R ²	Adjusted R ²	F
1	.653	.426	.423	121.563

Regression Coefficient

Predictor variable	B	Std. Error	Beta (β)	t	p-value
User Psychology	.587	.053	.653	11.025	.000

$P < .05$

The result in Table 4 indicated that user psychology significantly predicted service delivery in academic libraries, $\beta = .653$, $t(598) = 11.025$, $p < .05$. Consequently, the null hypothesis was rejected. This finding implies that psychological factors such as trust, satisfaction, motivation, perception, and technology acceptance play a major role in determining the effectiveness of service delivery in academic libraries. The result further suggests that positive psychological responses toward artificial intelligence technologies enhance users' engagement with library services and improve overall service quality.

7. Discussion of Findings

The findings of this study were discussed based on the four hypotheses formulated to examine the relationship among artificial intelligence, user psychology, and service delivery in academic libraries in Nigerian universities.

Relationship Between Artificial Intelligence Adoption and Service Delivery: The study revealed a significant positive relationship between artificial intelligence adoption and service delivery in academic libraries. This suggests that increased AI integration improves efficiency, accessibility, responsiveness, and quality of library services. The finding may be attributed to AI-driven systems that support faster information retrieval, automated cataloguing, real-time assistance, and personalized services. The result agrees with Akinola (2023), Emezaiwakpor et al. (2023), Isiaka (2023), and Fagbola and Egbebi (2025), who reported that AI technologies improve information retrieval, operational efficiency, and user-centered services in academic libraries.

Beyond supporting previous studies, the finding reflects the realities of Nigerian universities where overcrowded libraries, inadequate staffing, and increasing student populations place pressure on traditional library systems. In such contexts, AI technologies provide practical solutions for improving efficiency and reducing service delays. The finding also suggests that AI can help bridge information access gaps in developing countries where educational resources remain unevenly distributed.

Contrary to earlier concerns that infrastructural limitations may reduce the effectiveness of AI in African institutions, the present study indicates that even moderate AI implementation can positively improve library performance when supported by institutional commitment and user readiness. The

implication is that AI adoption has become essential for modern academic libraries seeking to improve research productivity, learning support, and institutional competitiveness in the digital age.

Influence of Artificial Intelligence Usage on Users' Psychological Responses: The study further revealed that artificial intelligence usage significantly influenced users' psychological responses such as trust, satisfaction, perception, and technology acceptance. This may be because AI systems simplify information access, improve responsiveness, and create more interactive user experiences.

The finding supports the Technology Acceptance Model (TAM), which explains that perceived usefulness and ease of use influence technology acceptance (Davis, 1989). The result aligns with Odelami et al. (2026), Lulu-Pokubo and Okwu (2025), and Kayode et al. (2026), who reported positive attitudes toward AI technologies in Nigerian libraries. Similarly, Akpan et al. (2024) emphasized that conversational AI systems improve engagement and accessibility in educational environments.

From a sociocultural perspective, the finding is important in Nigeria where students and lecturers increasingly rely on digital technologies for learning and research. Younger users with greater digital exposure may adapt more easily to AI-enabled services, whereas some older users and library staff may experience anxiety, fear of automation, or concerns about job displacement.

The finding also highlights challenges common in developing countries where digital literacy, socioeconomic conditions, and trust in technology influence users' willingness to adopt innovations. Consequently, successful AI implementation requires not only infrastructure but also user orientation, digital literacy training, and trust-building initiatives.

Difference in Perception of AI-Based Library Services Among Respondents: The study revealed significant differences in the perception of AI-based library services among students, lecturers, and library staff. This indicates that technological competence, professional roles, and prior digital exposure shape users' attitudes toward AI technologies.

The finding agrees with Edom-Agbor et al. (2025) and D'Souza (2024), who found variations in AI awareness and adoption among library professionals. Students were more likely to appreciate AI systems because of their preference for speed, convenience,

and accessibility, while some lecturers and librarians expressed concerns about reliability, ethics, privacy, and automation.

In the Nigerian context, disparities in digital literacy and ICT infrastructure also contribute to variations in perception. Users in technologically advanced universities may demonstrate more positive attitudes than those in under-resourced institutions. This reflects broader realities in developing countries where technological adoption remains uneven across institutions and social groups.

Unlike previous studies that reported generally positive attitudes toward AI, this study demonstrates that acceptance differs across user categories. This suggests that successful AI integration depends not only on technological availability but also on users' social experiences and psychological readiness. The implication is that academic libraries should adopt inclusive and user-sensitive implementation strategies through workshops, awareness programs, and targeted training for different user groups.

Predictive Influence of User Psychology on Service Delivery: The study further showed that user psychology significantly predicted service delivery effectiveness in academic libraries. Psychological variables such as trust, satisfaction, acceptance, motivation, and behavioural intention were found to influence the success of AI-driven services.

The finding aligns with Aguiar-Costa et al. (2022) and Ajani et al. (2022), who reported that psychological readiness and user satisfaction significantly influence technology utilization and service outcomes. The result also supports the Theory of Planned Behaviour (TPB), which emphasizes that attitudes, subjective norms, and perceived behavioural control influence technology acceptance (Ajzen, 1991).

The finding suggests that technological systems may remain ineffective when users lack confidence in or willingness to engage with them. In Nigeria and many developing countries, psychological readiness often determines whether technological innovations succeed or fail.

From a sociocultural perspective, the finding highlights the continued importance of human interaction in African service environments. Users may resist AI systems if they perceive them as replacing rather than supporting human-centered services. Therefore, AI technologies should complement human interaction rather than eliminate it entirely. The implication is that university

administrators and library managers should prioritize users' psychological preparedness through digital literacy training, ethical safeguards, awareness programs, and trust-building measures to enhance sustainable AI-driven service delivery.

8. Implications of the Study

Educational Implications: The findings indicate that AI technologies can improve access to academic resources, strengthen independent learning, and enhance research productivity in universities. AI-driven systems such as intelligent cataloguing and virtual reference services support faster access to scholarly information and improve teaching, learning, and research activities. The study also suggests that universities should integrate digital and AI literacy into academic programs while ensuring continuous professional training for librarians to remain relevant in evolving digital environments.

Psychological Implications: The study demonstrates that users' trust, perception, satisfaction, and acceptance significantly influence the effectiveness of AI-driven services. This implies that technological innovation alone cannot guarantee improved service delivery without positive psychological readiness among users. Consequently, libraries should address users' emotional and cognitive concerns through orientation programs, awareness campaigns, and user-friendly systems that reduce anxiety and improve confidence in AI technologies.

Technological Implications: The findings confirm that AI technologies have become essential tools for improving efficiency, information retrieval, and user engagement in academic libraries. However, inadequate infrastructure, unstable electricity, weak internet connectivity, and shortage of technical expertise remain major barriers to effective implementation in Nigeria. The study therefore emphasizes the need for sustained investment in digital infrastructure, technical support systems, and user-centered AI technologies that are accessible and responsive to diverse users.

Policy Implications: The study highlights the need for comprehensive policies promoting AI integration in academic libraries through sustainable funding, ICT development, staff training, and AI literacy programs. Policymakers should also address ethical concerns relating to privacy, cybersecurity, data protection, and algorithmic bias to strengthen users' trust in AI systems. Furthermore, policies should promote equitable access to digital technologies across universities to reduce technological inequalities

between urban and rural institutions. Effective AI policies must combine technological advancement with users' psychological readiness and continuous institutional support.

9. Conclusion

This study examined the relationship among artificial intelligence (AI), user psychology, and service delivery in academic libraries in Nigerian universities. The findings revealed that AI significantly improves library service delivery through enhanced information access, faster response systems, automated operations, and personalized user support. AI-driven tools such as chatbots, intelligent cataloguing systems, and virtual reference services were found to improve efficiency, accessibility, and responsiveness in academic libraries.

The study also established that AI usage significantly influences users' psychological responses, including trust, satisfaction, perception, and technology acceptance. Users who perceived AI systems as useful and user-friendly demonstrated more positive attitudes toward AI-enabled library services. This indicates that the effectiveness of AI in academic libraries depends not only on technological availability but also on users' psychological readiness and acceptance.

Furthermore, significant differences were found in the perception of AI-based library services among students, lecturers, and library staff, suggesting that technological exposure, professional roles, and digital competence shape users' attitudes toward AI technologies. The study additionally revealed that user psychology significantly predicts service delivery effectiveness, implying that trust, motivation, and acceptance are essential for successful AI implementation.

The study therefore concludes that AI has strong potential to transform academic library operations and service delivery in Nigerian universities when supported by adequate infrastructure, trained personnel, institutional support, and positive user orientation. It further demonstrates that technological advancement alone cannot guarantee effective service delivery without considering users' psychological acceptance and engagement. Consequently, sustainable AI integration in Nigerian academic libraries requires both technological investment and deliberate efforts to strengthen users' digital confidence and readiness.

10. Recommendations

Based on the findings of this study, the following recommendations are made:

University administrators and library management should invest in AI-driven technologies such as chatbots, intelligent cataloguing systems, automated circulation services, and virtual reference platforms to improve efficiency and user satisfaction in academic libraries.

Government agencies and university authorities should provide adequate funding for digital infrastructure, including stable internet connectivity, reliable electricity supply, and modern ICT facilities necessary for effective AI implementation.

Continuous training and capacity-building programmes should be organized for librarians and library personnel to improve AI literacy, technical competence, and readiness for technology-driven service delivery.

Academic libraries should implement user orientation and digital literacy programmes to improve students', lecturers', and researchers' trust, acceptance, and effective utilization of AI-based services.

Universities and policymakers should develop ethical guidelines and institutional policies addressing privacy, data protection, cybersecurity, and responsible use of AI technologies in academic libraries.

Collaboration among universities, professional library associations, ICT experts, and policymakers should be encouraged to facilitate knowledge sharing, technical support, and sustainable AI development in Nigerian academic libraries.

Future studies should examine additional psychological variables such as digital anxiety, self-efficacy, and behavioural intention, while comparative and longitudinal studies should also be conducted to expand knowledge on AI and academic library service delivery in developing countries.

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