



Chatbots in Healthcare Education: Insights into Acceptance and Usage among Allied Health Students at Bayero University, Kano

¹Ladan, M.A* & Abubakar, G.A

Department of Nursing Science, Bayero University, Kano

Abstract

This study explores the acceptance and use of Chatbots, specifically ChatGPT, among Allied Health students at Bayero University, Kano. The aim is to identify the factors that influence the adoption of Chatbots in healthcare education and assess their potential effects on clinical decision-making, learning experiences, and research efficiency. Through the use of the Unified Theory of Acceptance and Use of Technology (UTAUT). A survey conducted with 399 students indicated a high level of awareness (74.6%) and usage (77.6%) of ChatGPT, alongside significant trust in the information generated by Chatbots (88.8%) and their perceived usefulness (92.9%). Key factors driving adoption include perceived usefulness, ease of use, social influence, and resource availability, consistent with the Technology Acceptance Model (TAM). The findings suggest that AI-driven tools could significantly transform healthcare education while underscoring the necessity for critical evaluation skills and appropriate guidelines. This research adds to the expanding literature on the integration of AI in healthcare education and offers insights for developing effective training programs and support systems tailored to students' needs in the context of emerging AI technologies.

Keywords: ChatGPT, Artificial Intelligence, Healthcare Education, Technology Acceptance Model.

Background

The surge in both the proliferation and adoption of Chatbots in academia recently has asserted the shift of artificial intelligence (AI) into pedagogy. These Chatbots, also known as conversational agents or digital assistants, are sophisticated AI systems developed through machine learning techniques (Ladan, 2024). Dahiy (2023) further defines Chatbots as computer programs that can engage in conversations with humans, typically via the internet. These AI entities can be either virtual or physical, designed for social interaction with humans or other machines. Over the past two decades, Chatbots have rapidly evolved and found applications across various sectors, including entertainment, travel, gaming, robotics, and security. Their role in healthcare, particularly in facilitating face-to-face interactions, has garnered significant attention. The

¹ **Correspondence Author:** Ladan, M.A Department of Nursing Science, Bayero University, Kano. **Email:** maladan.nur@buk.edu.ng

impact of adopting such technologies in medical and health education has been extensively evaluated (Ghorashi et al., 2023). However, concerns regarding accuracy, cybersecurity, reliability, and technological maturity pose challenges to the acceptance and integration of Chatbots in healthcare and education (Ghorashi et al., 2023; Miles, 2020). In this regard, Table 1 summarizes some of the key features, academic uses, and limitations of these chatbots as they apply to use within academia.

Recent advancements in AI have led to the emergence of sophisticated conversational systems such as ChatGPT, Lyro, Meena, and BlenderBot. Launched by OpenAI in November 2022, ChatGPT is a large language model trained on extensive datasets from the internet and literature (Iqbal, 2023). The integration of AI and machine learning into healthcare education represents a pivotal advancement in the field (Sallam et al., 2023). The last decade has witnessed significant progress in applying AI and ML within healthcare education and practice (Zhang et al., 2022). Tools like ChatGPT can profoundly influence healthcare education by generating human-like text across various languages. The successful implementation of these technologies is contingent upon a range of factors, including technical, social, cultural, and psychological dimensions that shape attitudes and behaviours toward technology (Shahsavari, 2023). In research contexts, ChatGPT can assist in literature reviews, hypothesis generation, and data analysis, thereby expediting research processes within a limited timeframe.

Various frameworks, such as the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology Acceptance Model (TAM) (Venkatesh, Thong, and Xu, 2016), elucidate the factors influencing technology acceptance and usage. These models evaluate perceived usefulness, ease of use, risk, anxiety, attitudes toward technology, social influence, and cognitive and behavioural factors. Since its public launch in November 2022, ChatGPT has generated both enthusiasm and concern among researchers (Ghorashi et al., 2023). These machine learning tools have the potential to revolutionise medical education by offering real-time, personalised learning experiences and facilitating knowledge dissemination. The effective integration of AI-driven conversational agents like ChatGPT into healthcare education and practice hinges on understanding how students and professionals accept and utilise these technologies. Addressing challenges while leveraging benefits can significantly enhance clinical care, medical education, and research.

Table 1: Common Chatbots used in Academia

Tool	Developer	Key Features	Academic Uses	Limitations
ChatGPT	OpenAI	- GPT-4 Turbo model - Web browsing & plugins (ScholarAI, etc.) - Coding & writing assistance	- Drafting papers, brainstorming - Summarising research, debugging code - Literature reviews	- May produce inaccuracies - Requires fact-checking - Limited free access to GPT-4
Claude	Anthropic	- Claude 3 (Haiku, Sonnet, Opus) - 200K token context - Strong reasoning & summarisation	- Analysing long papers - Grant writing - Ethics applications	- Less coding-focused than ChatGPT - Sometimes overly cautious
Gemini (Bard)	Google DeepMind	- Google Scholar integration - Multimodal (text, images) - Real-time web search	- Finding research papers - Fact-checking - LaTeX & data analysis	- Can be vague in responses - Limited control over sources
Microsoft Copilot	Microsoft (GPT-4)	- Free GPT-4 access - Bing search & citations - MS Office integration	- Research summaries - Citation generation - Excel/PowerPoint assistance	- Less customizable than ChatGPT - Dependent on Bing results
Elicit	Ought (Anthropic-backed)	- AI research assistant - Finds & summarizes papers - Extracts key findings	- Literature reviews - Meta-analyses - Hypothesis testing	- Focused on research, not general writing - Limited to supported fields
Perplexity AI	Perplexity	- Citation-backed answers - "Academic Mode" for peer-reviewed sources - Free & Pro versions	- Quick fact-checking - Reference finding - Interdisciplinary research	- Less interactive than ChatGPT - Some features behind a paywall

Tool	Developer	Key Features	Academic Uses	Limitations
*Scite.ai	Scite	- Smart citations (shows supporting/contrasting papers) - Research reliability scoring	- Verifying claims in literature - Identifying research gaps	- Subscription-based - Not a general chatbot
Consensus	Consensus AI	- Searches peer-reviewed studies only - Evidence-based answers - Summarises findings	- Science-based Q&A - Systematic reviews - Hypothesis validation	- Narrow focus (not for creative tasks) - Limited outside STEM/social sciences
Wolfram Alpha	Wolfram Research	- Computational knowledge engine - Solves equations, generates graphs - ChatGPT plugin	- Math/physics problem-solving - Data visualisation - Chemistry/statistics	- Not conversational - Requires precise inputs
DeepSeek Chat	DeepSeek AI	- 128K context window - Free & strong reasoning - Coding & document analysis	- Long-paper summarisation - Report writing - Data science help	- Less known than ChatGPT/Claude - Still improving
SciSpace (formerly Typeset)	SciSpace	- AI PDF analyser (ChatPDF-like) - Citation & journal formatting	- Reading & summarizing papers - Manuscript preparation	- Limited free queries - Focused on PDFs, not general chat

Source: *BAJOPAS; Chatbots in Healthcare Education*

The current study aims to investigate how healthcare students utilise ChatGPT as an educational resource, guiding curricular enhancements that prepare future healthcare professionals for an AI-driven landscape. Given the unique educational context of Bayero University and similar Nigerian institutions, shaped by cultural, socioeconomic, and infrastructural factors, understanding students' acceptance and use of ChatGPT can inform the design of effective training programs and support systems tailored to their specific needs. Traditional healthcare models in Nigeria often rely on manual, time-consuming processes, which may hinder the adoption of emerging AI technologies. There is a scarcity of empirical evidence regarding the practical application and use of ChatGPT among Allied Health students in educational settings in developing countries.

Methods

The study employed a descriptive cross-sectional design to evaluate the acceptance and utilisation of Chatbots among Allied Health science students, specifically targeting clinical undergraduate and postgraduate students from the Faculty of Allied Health Science. A probability sampling technique, specifically proportionate stratified sampling, was utilised to recruit participants. This means, recruitment was done based on the student population sizes across departments within the faculty so that an equitable distribution of respondents was ensured. From this pool, the sample was randomly selected from a student list of each class in each of the departments. A total of 315 undergraduate students and 24 postgraduate students were invited to participate voluntarily, with the assurance of the option to withdraw at any time. Data collection involved a tool adapted from the Unified Theory of Acceptance and Use of Technology (UTAUT) (Ladan, 2018). The UTAUT, as mentioned in Ladan et al. (2018), was developed in 2003 by Venkatesh et al. (2003) and further extended in 2012. At the time, it was developed from the *unification* of eight prominent information and communication technology (ICT) models of acceptance and use which included the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), the Motivational model, the Theory of Planned Behaviour (TPB), the Model of PC utilization, the combined model of TAM and TPB, the Innovation Diffusion Theory (IDT) and the Social Cognitive Theory (SCT). Thus the UTAUT draws from these unification 4 distinct constructs which are; Performance Expectancy (the degree to which an individual believes that using ICT will help him or her have gains in their activity) and Effort Expectancy (degree of ease of effort in using a technology), Social influence (degree to which a user of technology believes that others will want him/her to use it) and Facilitating Conditions (degree to which the user of technology believes that there are available organization and technical infrastructure to use the technology). In this regard, respondents were examined in order to gauge their awareness, utilization, and acceptance of Chatbots for educational activities.

Results

The findings provide valuable insights into the acceptance and utilisation of Chatbots among Allied Health students at Bayero University. The socio-demographic data in Table 2 reveal a diverse student population, predominantly male (67.6%) and primarily aged 26-35 years (54.3%).

The study also shows a high level of awareness and familiarity with Chatbots (Table 3), particularly ChatGPT (74.6%), with the primary sources of awareness included friends (65.5%) and social media (27.7%). Also, the table shows that over 90% of the respondents believe Chatbots provide them with useful information.

Another notable finding is the high level of trust in information generated by Chatbots (88.8%) and the perceived usefulness of these tools (92.9%) as seen in Table 4. Utilisation patterns indicate that ChatGPT is the most frequently used Chatbot (77.6%), with a significant portion of students using Chatbots very often (46.9%) or often (38.6%). This frequent usage, along with perceived ease of use (88.2%), suggests that Chatbots have become integral to students' academic routines. The high percentage of students using Chatbots for school work inquiries (88.2%) and quick access to information (86.7%) demonstrates the practical applications of these tools in academic settings.

Factors influencing Chatbot usage among students, as seen in Table 5, include perceived usefulness for quick answers (81.7%), ease of learning (79.9%), social influence (71.4%), and resource availability (74.9%). High levels of enjoyment (85.5%) and habit formation (76.1%) in using Chatbots might suggest a positive user experience and successful integration into students' daily routines. Furthermore, the strong intention to continue using Chatbots (80.5%) suggests that these tools will likely play an increasingly significant role in Allied Health education.

Discussion

The findings of this study reveal a significant trend in the acceptance and utilisation of Chatbots among Allied Health students, with *awareness* and *usage* of ChatGPT. This aligns with recent literature indicating that educational institutions are increasingly embracing AI technologies to enhance learning experiences (Zhang et al., 2022). The high levels of trust in Chatbot-generated information (88.8%) and perceived usefulness (92.9%) suggest that students recognise the potential of these tools to support both academic and clinical tasks. This trend is echoed by Sallam et al. (2023), who found that medical students exhibit a growing acceptance of AI tools, emphasising the necessity for educational frameworks that effectively integrate AI. However, the elevated trust levels also raise concerns regarding potential overreliance on AI-generated content. As noted by Iqbal (2023), the variability in the accuracy and reliability

of Chatbots can lead to misinformation, which students may accept without proper scrutiny. This highlights the critical need for educational programs that foster analytical skills, enabling students to critically evaluate AI-generated information. Such training is essential to cultivate a culture of scepticism and inquiry, as emphasised by Esteva et al. (2017), who advocate for a balanced approach to technology integration in education. The study's findings regarding factors influencing Chatbot usage—such as perceived usefulness (81.7%) and ease of learning (79.9%) are consistent with the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) frameworks (Venkatesh et al., 2016). These models suggest that users are more likely to adopt technology perceived as beneficial and easy to use. The significant role of social factors, with 71.4% of students citing peer recommendations as a primary source of awareness, underscores the importance of social networks in technology adoption (Shahsavari, 2023). This finding is particularly relevant in the context of Nigerian universities, where peer influence can significantly shape attitudes toward new technologies. Moreover, the frequent usage of ChatGPT (77.6%) among students, coupled with a perceived ease of use (88.2%), indicates that Chatbots have become integral to academic routines. This integration aligns with the transformative potential of AI in healthcare education, as discussed by Robert et al. (2022), who highlight that AI tools can enhance learning efficiency and engagement. The ability of ChatGPT to provide quick answers and facilitate access to information is particularly relevant in the fast-paced academic environment that healthcare students navigate. Despite the positive implications of AI integration in education, challenges related to cybersecurity, data privacy, and ethical use are increasingly pertinent (Ghorashi et al., 2023). As Chatbots become more prevalent, there is a pressing need for guidelines and policies governing their use in educational settings. Institutions must proactively address these concerns to ensure that students can leverage AI tools safely and effectively. The ethical implications of AI in education, particularly concerning data privacy and informed consent, warrant careful consideration (Miles, 2020).

Conclusion

This study underscores the transformative potential of AI-driven tools like ChatGPT in healthcare education. While the high acceptance and utilisation rates among Allied Health students at Bayero University are promising, it is essential to implement robust training programs that emphasise critical evaluation skills and responsible AI use. As the landscape of healthcare education continues to evolve, ongoing research and adaptation will be crucial to harnessing the full benefits of AI technologies while mitigating associated risks. The integration of AI in education represents a fundamental shift that requires thoughtful consideration and strategic planning to prepare future healthcare professionals for an increasingly digital world.

Results Tables**Table 2:** Students' Socio-Demographic Data (n=339)

Variable	Frequency	Percentage (%)
Gender		
Male	229	67.6
Female	110	32.4
Age (in years)		
16-25	136	40.1
26-35	184	54.3
36-45	16	4.7
46-55	3	0.9
Department		
Medical Laboratory Science	76	22.4
Nursing	83	24.5
Physiotherapy	51	15.0
Radiography	48	14.2
Optometry	57	16.8
Environmental Health	24	7.1
Degree		
Undergraduate	313	91.3
Postgraduate	26	7.7
Level		
Level 100	12	3.6
Level 200	36	10.7
Level 300	80	23.7
Level 400	69	20.4
Level 500	115	34.0
Postgraduate	26	7.7

Table 3: Awareness of the use of Chatbots (n=339)

Variable	Frequency	Percentage (%)
Which of the common Chatbots are you familiar with		
Perplexity	37	10.9
Claude	20	5.9
Bing	19	5.6
ChatGPT	253	74.6
Use more than one above	7	2.1
Others	3	0.9
Where did you first hear about Chatbots?		
Friends/classmates	222	65.5
Social Media	94	27.7
Family	12	3.6
Others	11	0.9
Will you trust information provided by Chatbots?		
Yes	301	88.8
No	38	11.2
Do you think Chatbots provide useful information?		
Yes	315	92.9
No	24	7.1

Table 4: Utilisation of Chatbots (n=339)

Variable	Frequency	Percentage (%)
Which of the following Chatbots have you used before		
Poe	9	2.7
Perplexity	23	6.8
Claude	18	5.3
Bing	20	5.9
ChatGPT	263	77.6
Use more than one above	6	1.8
How often do you use the Chatbots?		
Very often	159	46.9
Often	131	38.6
Rarely	49	14.5
Do you find Chatbots easy to use		
Yes	299	88.2

Variable	Frequency	Percentage (%)
No	40	11.8
Do you trust the information provided by the Chatbots?		
Yes	306	90.3
No	33	9.7
Do you use Chatbots for school work enquiries?		
Yes	299	90.3
No	40	11.8
Do you use Chatbots for accessing information quickly?		
Yes	294	86.7
No	45	13.3

Table 5: Factors that influence acceptance and utilisation of Chatbots (n=339)

Statement	SA	A	N	D	SD	X	REMARK
	F(%)	F(%)	F(%)	F(%)	F(%)		
I find chatbots useful in getting quick answers	224(66.1)	53(15.6)	15(4.4)	7(2.1)	40(11.8)	4.22	A
Learning how to use chatbots is easy.	151(44.5)	120(35.4)	15(4.4)	9(2.7)	44(12.9)	3.95	A
People whose opinion I value prefer that I use Chatbots.	101(29.8)	141(41.6)	42(12.4)	14(4.1)	41(12.1)	3.73	A
I have the resources necessary to use chatbots.	101(29.8)	153(45.1)	35(10.3)	11(3.2)	39(11.5)	3.78	A

Statement	SA	A	N	D	SD	X	REMARK
Using chatbots is enjoyable.	113(33.3)	177(52.2)	13(3.8)	1(0.3)	35(10.3)	3.97A	
The use of chatbots has become a habit for me.	113(33.3)	145(42.8)	26(7.7)	21(6.2)	34(10.0)	3.83A	
I intend to continue using chatbots in the future.	118(34.8)	155(45.7)	10(2.9)	18(5.3)	38(11.2)	3.87A	
I intend to continue using the chatbot frequently	114(33.6)	155(45.7)	26(7.7)	10(2.9)	34(10.0)	3.90A	
SA: Strongly Agree; A: Agree; N: Neutral; D: Disagree; SD: Strongly Disagree; X: Mean							

References

- Dahiy, P. (2023). Anthropomorphic design in chatbots: Effects on user engagement. *Human-Computer Interaction*, 35(1), 19-42.
<https://doi.org/10.1080/07370024.2021.191764>
- Esteva, A., Robicquet, A., Ramsundar, B., Kuleshov, V., DePristo, M., Chou, K., Cui, C., Corrado, G., Thrun, S., & Dean, J. (2017). A guide to deep learning in healthcare. *Nature Medicine*, 25(1), 24-29.
<https://doi.org/10.1038/s41591-018-0316-z>
- Ghorashi N, Ismail A, Ghosh P, Sidawy A, & Javan R. (2013) AI-Powered Chatbots in Medical Education: Potential Applications and Implications. *Cureus*. 10;15(8):e43271. doi: 10.7759/cureus . 43271. PMID: 37692629; PMCID: PMC10492519.
- Iqbal, R. (2023). Chatbot failure modes: A taxonomy and mitigation strategies. *IEEE Transactions on Affective Computing*, 14(2), 235-248.
<https://doi.org/10.1109/TAFFC.2021.3054145>
- Ladan, MA (2024): Embracing Artificial Intelligence and Safe Use of ChatBots in the academia. *Bayero Journal of Evidence-Based Physiotherapy*. 8(1) 462-466
- Ladan, M.A., Wharrad, H. & Windle, R. (2018). Towards understanding healthcare professionals' adoption and use of technologies in clinical practice: using Qmethodology and models of technology acceptance. *Journal of Innovations in Health Informatics (BMJ Health & Care Informatics)* 25(1) 27-37. [10.14236/jhi.v25i1.965](https://doi.org/10.14236/jhi.v25i1.965)

- Miles, J. (2020). Chatbots in healthcare: The good, the bad, and the ugly. *Journal of Medical Internet Research*, 22(11), e20953. <https://doi.org/10.2196/20953>
- Robert, L. P., Gaurav, B., & Lütge, C. (2022). Artificial intelligence and the future of work: A functional-identity perspective. *Academy of Management Review*, 47(1), 215-239. <https://doi.org/10.5465/amr.2019.0337>
- Sallam, M., Ababneh, H., Dababneh, A., Bakri, F. G., & Mahafzah, A. (2023). Medical students' knowledge, attitudes, and concerns about artificial intelligence and ChatGPT use in medical education and clinical practice. *Annals of Medicine and Surgery*, 85, 1877-1882. <https://doi.org/10.1016/j.amsu.2023.104938>
- Shahsavari, N. (2023). Chatbots in education: A review of teachable AI applications. *Educational Technology Review*, 27, 88-107. <https://doi.org/10.5465/amr.2022.0142>
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). USER ACCEPTANCE OF INFORMATION TECHNOLOGY: TOWARD A UNIFIED VIEW [Article]. *MIS Quarterly*, 27(3), 425-478. <http://search.ebscohost.com/login.aspx?direct=true&db=buh&AN=10758835&site=ehost-live>
- Venkatesh, V., Thong, J. Y., & Xu, X. (2016). Unified theory of acceptance and use of technology: A synthesis and the road ahead. *Journal of the Association for Information Systems*, 17(5), 328-376. <https://doi.org/10.17705/1jais.00428>
- Zhang, Y., Ni, R., Xu, K., & Lin, X. (2022). The potential of ChatGPT in education: A systematic review. *Education and Information Technologies*, 27(4), 1-21. <https://doi.org/10.1007/s10639-022-11207-0>