



Research Paper

Stakeholders' Views on Ai-Powered Chatbots for Enhancing Student Support Services in Nigerian Universities: A Case Study of Al-Hikmah University

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Abstract

The increasing integration of artificial intelligence (AI) in higher education has led to growing interest in the use of AI-powered chatbots to enhance student support services. This qualitative study explores stakeholders' views on AI-powered chatbots for enhancing student support services in Nigerian universities: a case study of Al-Hikmah university. Semi-structured interviews were conducted with 46 university administrators, faculty members, IT staff, and students, alongside focus group discussions with students, to gather diverse perspectives on this emerging technology. Thematic analysis was used to identify key themes related to the perceived benefits, such as improved efficiency, personalized support, and 24/7 availability of services, as well as challenges, including concerns about data privacy, lack of human interaction, and potential technical issues. Findings suggest that while stakeholders acknowledge the potential for AI-powered chatbots to streamline administrative tasks and enhance student experience, there are reservations about their readiness and the infrastructural demands for effective implementation. The study concludes by highlighting the need for comprehensive training, improved infrastructure, and stakeholder involvement to ensure the successful adoption of AI-powered chatbots in student support services. These views provide valuable information for policymakers and university administrators considering AI-driven solutions for improving student support in Nigerian universities.

Keywords: AI, Perceptions, Support Services, Challenges, Potentials, Qualitative Approach

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1. Introduction

The rapid advancement of technology has brought transformative changes across many sectors, with higher education being significantly impacted. Among these innovations, artificial intelligence (AI) has emerged as a transformative force in educational institutions worldwide, streamlining operations, personalizing learning experiences, and enhancing service delivery (Lu et al., 2021). A particularly prominent application of AI in higher education is the use of AI-powered chatbots. These tools provide immediate, automated, and personalized responses to a wide range of student queries, spanning areas such as academic advising, course registration, library services, and mental health support (Gillet-Swan, 2023). By facilitating prompt communication and improving access to critical information, AI-powered chatbots hold the potential to revolutionize student engagement, fostering efficiency, accuracy, and timeliness in the delivery of student services (Sharma & Kumar, 2020).

Despite the global potential of AI-powered chatbots, their implementation in Nigerian universities, including Al-Hikmah University in Kwara State, remains in its infancy (Adetayo et al., 2022). As a leading private institution, Al-Hikmah University is exploring the feasibility of adopting AI-powered chatbots to address challenges in its student support services. However, the successful integration of this technology depends significantly on the perceptions, readiness, and engagement of stakeholders, including university administrators, faculty members, IT staff, and students. Stakeholder Theory, which emphasizes the importance of understanding and addressing the interests, expectations, and contributions of all parties affected by organizational initiatives, provides a valuable framework for examining the dynamics surrounding the adoption of AI tools in higher education (Freeman, 1984).

Globally, research demonstrates that AI-powered chatbots can significantly enhance student services by offering 24/7 support, reducing response times, and enabling more personalized assistance, ultimately improving the student experience (Rashid et al., 2020). For example, Rashid et al. (2020) found that chatbots streamline administrative processes by managing high volumes of inquiries, freeing up staff to focus on complex tasks. Additionally, Gillet-Swan (2023) highlights the role of chatbots in addressing student mental health concerns by offering a non-judgmental platform for guidance and support, particularly during high-stress periods.

In the Nigerian context, however, several barriers hinder the adoption of AI technologies in higher education, including limited technological infrastructure, financial constraints, and resistance to change among stakeholders (Adetayo et al., 2022; Eze et al., 2023). Institutions like Al-Hikmah University face challenges such as insufficient infrastructure, the financial burden of implementing and maintaining AI systems, and the need for stakeholder training to ensure effective use of the technology (Sharma & Kumar, 2020). Furthermore, the perceptions and readiness of stakeholders are critical to overcoming these barriers, as their active support and engagement are essential for successful adoption. Stakeholder Theory underscores the

necessity of aligning technological initiatives with the values, concerns, and capacities of all relevant stakeholders to ensure long-term sustainability and impact (Freeman, 1984).

This study seeks to address the following central research question: How do key stakeholders at Al-Hikmah University perceive the potential benefits, challenges, and implications of implementing AI-powered chatbots in student support services? By adopting Stakeholder Theory as its guiding framework, the study will explore how administrators, faculty, IT staff, and students view the integration of AI-powered chatbots, focusing on their expectations, readiness, and potential concerns. The findings aim to provide actionable insights into the feasibility of implementing chatbots at Al-Hikmah University and contribute to the broader discourse on AI adoption in education. This theoretical grounding and stakeholder-focused approach will enhance the study's significance by demonstrating how the alignment of stakeholder perspectives can foster the effective integration of emerging technologies in higher education.

2. Literature Review

AI-powered chatbots are digital tools designed to simulate human conversations using natural language processing (NLP) and machine learning algorithms. In the context of higher education, these chatbots have proven to be transformative by providing 24/7 support to students, addressing their queries, guiding them through administrative processes, and offering academic and mental health support. The integration of chatbots complements human advisors by managing routine inquiries and enabling staff to focus on more complex tasks (Ibrahim & Yakub, 2024). Recent advancements in AI have significantly enhanced the usability and functionality of chatbots, making them integral to improving the student experience in educational institutions.

Several studies have examined the potential and challenges of AI-powered chatbots in higher education. Zhang and Wang (2020) evaluated the efficiency of chatbots in answering frequently asked questions at a large university. Their findings highlighted the importance of chatbots during peak periods, such as enrollment, where instant responses are critical to addressing student concerns. However, the study emphasized that the accuracy of chatbot responses is pivotal to user satisfaction, necessitating continuous updates to the knowledge base. Similarly, Smith and Johnson (2019) focused on user acceptance, identifying ease of use and relevance of information as key factors influencing the adoption of chatbots. They further noted that chatbots could alleviate administrative burdens but underscored the need to train students effectively in using these tools.

The role of AI-powered chatbots in enhancing student services has also been explored in developing contexts. Rashid et al. (2020) studied the integration of AI technologies in Nigerian public universities, revealing both opportunities and challenges. While there was enthusiasm about AI-powered solutions, concerns were raised about technological readiness, funding, and

stakeholder support. Yusuf and Ibrahim (2024) delved deeper into the perceptions of stakeholders in Nigerian private universities. Their research found that students and younger faculty were generally receptive to AI-driven systems, while older staff expressed skepticism due to concerns over data privacy, technological infrastructure, and potential job displacement. These findings underscore the need for targeted awareness campaigns and capacity-building initiatives to ensure widespread adoption of AI technologies in education.

Expanding on earlier research, Kaur et al. (2022) highlighted the potential of chatbots in fostering personalized learning experiences. Their study demonstrated that AI chatbots could identify individual student needs and tailor responses to provide customized academic support. Additionally, Gupta and Singh (2021) analyzed the effectiveness of chatbots in improving communication between students and administrative staff, emphasizing that the perceived utility of chatbots enhances student satisfaction and institutional reputation. However, they also noted that issues such as natural language understanding (NLU) limitations and cultural nuances remain challenges for chatbot implementation.

Incorporating global perspectives, Martin et al. (2023) explored the adoption of AI-powered chatbots in higher education institutions across Europe and Asia. They reported that chatbots reduced response times, streamlined administrative workflows, and improved student engagement. However, they also identified significant disparities in technological readiness and stakeholder acceptance across regions. Similarly, Alam et al. (2024) focused on the ethical considerations surrounding AI in education, including data privacy, algorithmic bias, and accountability in decision-making, all of which are critical to ensuring the ethical use of chatbots.

The Technology Acceptance Model (TAM), developed by Davis (1989), provides a theoretical lens to understand stakeholders' adoption of AI-powered chatbots. TAM posits that perceived usefulness (PU) and perceived ease of use (PEOU) are the primary determinants of technology acceptance. In the context of chatbots, PU refers to stakeholders' belief that chatbots enhance the quality and efficiency of student support services, while PEOU pertains to the ease of learning and using the technology. Studies by Liu et al. (2022) and Kim et al. (2023) applied TAM to evaluate chatbot adoption, confirming that when stakeholders perceive chatbots as beneficial and user-friendly, their likelihood of acceptance increases. This theoretical framework provides valuable insights into the factors influencing the successful integration of chatbots in Nigerian universities.

In conclusion, the literature emphasizes the potential of AI-powered chatbots to revolutionize student services in higher education. While the benefits such as improved efficiency, accessibility, and communication are well-documented, challenges like data privacy concerns, technological infrastructure, and stakeholder readiness remain barriers to widespread adoption. Addressing these challenges through continuous innovation, stakeholder engagement,

and robust policy frameworks will be crucial to realizing the full potential of chatbots in enhancing student support services.

2.1 Theoretical Framework

The study on stakeholders' views on AI-powered chatbots for student support in Nigerian universities, using Al-Hikmah University as a case study, is anchored on Stakeholder Theory and the Technology Acceptance Model (TAM). These theories provide a robust foundation for understanding the perceptions, expectations, and acceptance of stakeholders regarding the adoption of AI-powered chatbots in higher education institutions.

Stakeholder Theory, originally introduced by Freeman (1984), underscores the significance of identifying, understanding, and addressing the needs of all parties affected by an organization's activities. In higher education, stakeholders include students, faculty, administrative staff, IT personnel, university management, and external partners. Recent studies have highlighted the relevance of this theory in educational technology by emphasizing the role of stakeholder engagement in driving the success of technological innovations (Anderson & Hearn, 2021).

In the context of AI-powered chatbots, Stakeholder Theory is particularly relevant because successful implementation depends on understanding the diverse perceptions and expectations of these groups. For instance, students, as the primary end-users, assess the chatbot based on its usability and effectiveness in addressing their concerns. Faculty and administrative staff may evaluate it from the perspective of operational efficiency, considering its potential to reduce workload. Meanwhile, IT personnel are concerned with the technical implementation, while university management assesses the strategic value, cost implications, and long-term sustainability of the chatbot system. This comprehensive engagement ensures that the chatbot solution aligns with the institutional goals and stakeholder needs, thus enhancing its adoption and effectiveness.

Moreover, Stakeholder Theory highlights the importance of communication and collaboration in resolving concerns such as data privacy, user training, and technological readiness. As Rashid et al. (2020) point out, addressing these concerns is crucial for fostering trust and gaining stakeholder buy-in during the implementation of AI-driven solutions in educational settings.

The Technology Acceptance Model (TAM), developed by Davis (1989), provides a theoretical framework to understand how users adopt and interact with technology. TAM identifies two primary factors that influence technology adoption: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). PU refers to the extent to which users believe that the technology will improve their performance or address their needs, while PEOU relates to the perceived simplicity of using the technology. In the context of AI-powered chatbots, PU

reflects stakeholders' perceptions of the chatbot's ability to enhance the efficiency and quality of student support services. For example, students may perceive the chatbot as a tool that provides instant responses to queries, thereby improving their overall experience. Faculty and staff may see the chatbot as a means to reduce repetitive administrative tasks, enabling them to focus on more strategic activities. On the other hand, PEOU involves how intuitive and user-friendly the chatbot is for different stakeholders. If the chatbot requires minimal effort to learn and use, stakeholders are more likely to accept and adopt it. Recent studies have validated TAM's applicability in educational technology. Liu et al. (2022) found that TAM was instrumental in understanding the adoption of AI chatbots in higher education, where PU and PEOU significantly influenced stakeholders' acceptance. Similarly, Kaur et al. (2022) highlighted that ease of use and perceived benefits were critical for driving user satisfaction and engagement with AI-powered tools.

By integrating Stakeholder Theory and TAM, this study addresses both the social and psychological dimensions of AI chatbot adoption at Al-Hikmah University. Stakeholder Theory provides a broad framework to analyze the diverse interests and concerns of various stakeholder groups, ensuring that their views are incorporated into the planning and implementation process. For instance, understanding students' expectations of efficiency and privacy can inform the design of the chatbot, while addressing faculty concerns about job security can enhance acceptance among staff. TAM complements this approach by offering insights into the factors that drive individual stakeholders' acceptance of the technology. The alignment of PU and PEOU with stakeholder expectations is critical to ensuring that the chatbot is both functional and user-friendly. For example, simplifying the chatbot interface and providing adequate training for users can improve ease of use, while regularly updating the chatbot's knowledge base can enhance its perceived usefulness. Together, these theories offer a holistic framework for understanding stakeholders' views on AI-powered chatbots. They provide actionable insights for designing, implementing, and sustaining chatbot solutions that meet the needs of a diverse group of users while addressing the institutional goals of Al-Hikmah University.

2.2 Research Questions

- 1.** What are the potential benefits of AI-powered chatbots for enhancing student support services in Al-Hikmah University?
- 2.** What are the potential challenges associated with the use of AI-powered chatbots in student support services at Al-Hikmah University?
- 3.** How do stakeholders' expectations and concerns about AI-powered chatbots differ across various roles in Al-Hikmah University?
- 4.** What are the factors to be considered for the successful integration of AI-powered chatbots into existing student support services at Al-Hikmah University?

3. Methodology

The study adopted a qualitative research design to explore stakeholders' perceptions of the potential benefits and challenges of AI-powered chatbots in enhancing student support services at Al-Hikmah University. The qualitative approach was chosen to provide an in-depth understanding of participants' experiences, attitudes, and concerns, offering rich insights into their perceptions and expectations. A case study design was employed to focus exclusively on Al-Hikmah University as the primary site of investigation, enabling a detailed examination of the specific context, dynamics, and technological adoption processes within the institution.

The study's target population included key stakeholders at Al-Hikmah University, comprising university administrators, faculty members, IT staff, and students. A purposive sampling method was employed to select participants with direct experience or involvement in student support services and technology adoption, ensuring the inclusion of knowledgeable individuals. Convenience sampling further allowed access to participants who were readily available. A total of 46 participants were engaged in the study, reflecting a diverse range of perspectives, as shown in Table 1. This sample size was justified based on the need to capture a diverse range of perspectives while maintaining manageability for in-depth qualitative analysis. The selection ensured representation from various stakeholders directly involved in or impacted by the adoption of AI-powered chatbots in student support services, thus providing a holistic view of the phenomenon under investigation.

Data collection involved individual interviews with university administrators, faculty members, and IT staff, as well as focus group discussions with undergraduate and postgraduate students. The interviews and focus groups explored participants' expectations, experiences, and concerns regarding AI-powered chatbots.

Thematic analysis was conducted inductively to identify common themes and patterns related to stakeholders' perceptions of AI-powered chatbots. This approach allowed themes to emerge naturally from the data rather than being pre-determined. Data analysis was performed manually, beginning with transcription of the audio recordings into verbatim text to ensure accuracy and faithful representation of participants' responses. Transcriptions were anonymized to maintain confidentiality, and a unique identifier was assigned to each participant. Initial coding involved a thorough review of the transcripts, highlighting key phrases and sections relevant to the research questions. Codes were systematically organized into a codebook, which listed all codes and their definitions to ensure consistency and clarity throughout the analysis.

The codes were further refined and grouped into broader themes, creating a coding hierarchy that reflected the relationships between codes and themes. Table 2 illustrates the coding hierarchy, demonstrating how key themes were developed. Verification of the coded data was conducted through cross-checking with original transcripts to ensure reliability and validity. This process allowed for the adjustment of themes as necessary, enhancing the

robustness of the findings. Data synthesis followed, summarizing the insights and drawing connections between themes to address the research questions comprehensively. This iterative process of thematic analysis provided a structured and detailed understanding of the potential benefits and challenges of AI-powered chatbots in student support services.

Table 1. Sample Composition

S/N	Participant Group	Number of Participants
1.	Faculty Members	10
2.	University Administrators	2
3.	IT Officers	3
4.	Undergraduate Students	13
5.	Postgraduate Students	12
6.	Support Services Personnel	6
	Total	46

Table 2. Coding Hierarchy

Theme	Sub-Themes	Codes
Benefits of Chatbots	Improved Efficiency	Automation, Response Time
	Enhanced Accessibility	24/7 Support, Multilingual Use
Challenges of Adoption	Technical Barriers	Integration Issues, Cost
	Stakeholder Concerns	Trust, Privacy, User Resistance
User Expectations	Customization	Personalized Responses
	Support Coverage	Academic, Administrative

4. Analysis

4.1 Response to Research Questions

Research Question 1: What are the potential benefits of AI-powered chatbots for enhancing student support services in Al-Hikmah University?

Participants' views on the potential benefits of AI-powered chatbots for enhancing student support services at Al-Hikmah University are given below:

The potential benefits of AI-powered chatbots for enhancing student support services at Al-Hikmah University were widely acknowledged by stakeholders, with consistent themes of efficiency, accessibility, and personalization emerging.

One recurring benefit highlighted by stakeholders is the ability of AI-powered chatbots to reduce the workload on administrative staff by automating routine inquiries and tasks. For instance, a faculty member noted, "*Chatbots can handle routine queries, allowing staff to focus*

on more complex tasks." Similarly, support staff emphasized that chatbots would alleviate pressure during peak periods like registration, enabling them to manage more challenging issues. This operational efficiency aligns with the views of the IT team, who pointed out that chatbots offer scalability, making it possible to handle larger volumes of inquiries without requiring a proportional increase in staff.

Another significant theme was the 24/7 accessibility of support services through AI chatbots. As one faculty member observed, *"Students will have access to assistance outside regular office hours, which is particularly beneficial for urgent inquiries."* Undergraduate students echoed this sentiment, highlighting the convenience of accessing support during weekends or late at night. This accessibility was also seen as especially advantageous for international students, with one student stating, *"It eliminates language barriers and provides immediate guidance without embarrassment."*

The personalization of services was frequently mentioned as a transformative benefit. Faculty members noted that chatbots could provide tailored responses based on individual student profiles, enhancing the relevance and quality of advice. A postgraduate student similarly remarked, *"Chatbots can be customized to meet specific needs, ensuring accurate and relevant information for students."* The IT team reinforced this view, emphasizing that chatbots could integrate with existing university systems to deliver personalized information, such as grades, schedules, and reminders about deadlines.

Data-driven insights emerged as another critical advantage. University administrators highlighted the ability of chatbots to collect and analyze data on common student inquiries. This feature, as one administrator noted, *"allows the university to refine its services to better meet student needs."* The IT team further added that machine learning capabilities enable chatbots to improve their responses over time, making them increasingly effective.

Cost-effectiveness and consistency were also key points raised by stakeholders. Postgraduate students and support staff agreed that chatbots would reduce the need for additional staff while ensuring consistent responses to common queries. As one support staff member stated, *"Students will receive uniform information regardless of when or where they ask their questions."*

In summary, stakeholders at Al-Hikmah University recognized the potential of AI-powered chatbots to enhance student support services through improved efficiency, accessibility, personalization, and cost-effectiveness. By automating routine tasks, offering 24/7 support, and delivering tailored guidance, AI chatbots were seen as a transformative tool for improving student satisfaction and institutional operations.

Research Question 2: What are the potential challenges associated with the use of AI-powered chatbots in student support services at Al-Hikmah University?

The implementation of AI-powered chatbots for student support services at Al-Hikmah University has elicited diverse concerns among stakeholders. A recurring theme is the potential loss of personalized human interaction. One faculty member observed, "*Chatbots may not fully understand the nuances of students' needs, which can hinder the quality of advice provided.*" This sentiment reflects broader apprehensions about the impersonal nature of chatbot interactions, with students fearing that the lack of human empathy could compromise meaningful support. For instance, a student noted, "*The absence of human empathy might make the service less effective in addressing complex issues.*"

Another major concern centers on technical limitations and reliability. Faculty members highlighted that chatbots might "fail to handle contextual academic issues where detailed discussions are necessary to assist students in critical thinking or decision-making." *Similarly, IT staff pointed out that while chatbots excel at routine tasks, they struggle with complex or sensitive issues, potentially requiring human intervention. A student reinforced this perspective by stating, "System glitches or chatbots providing incorrect information could frustrate users."* Data privacy and security emerged as critical challenges, particularly among faculty and students. A faculty member emphasized, "*Robust data protection measures are essential to address ethical concerns regarding student data privacy.*" Students echoed this concern, fearing that their personal information might be mishandled or compromised. This issue underscores the need for stringent data security protocols to build trust in the system.

Infrastructure inadequacies and resource constraints were also prominent in stakeholders' feedback. University administrators highlighted the high cost of implementing and maintaining an AI system, noting, "*Funding and resource allocation could strain the university's budget.*" Faculty members expressed doubts about the university's readiness for such technological advancements, citing "*insufficient infrastructure, resources, and training.*" Moreover, student support staff raised concerns about scalability, questioning whether the chatbot system could handle peak periods, such as during admissions or examinations.

Resistance to change was another recurring theme, with administrators and students alike identifying this as a potential barrier. An administrator observed, "*Staff and students less familiar with new technology may resist adoption, leading to low initial engagement.*" Furthermore, students from diverse linguistic backgrounds expressed concerns about language limitations, arguing that chatbots might not adequately support multilingual needs. This highlights the importance of designing inclusive systems that cater to the university's diverse community.

Finally, concerns about the integration of chatbots with existing student support systems were prominent. Support staff cautioned that "*system integration with learning management systems and student databases could pose challenges.*" They also warned that overreliance on chatbots might weaken the university's student support culture, reducing meaningful student-

staff interactions. One student remarked, "*Overreliance on chatbots could lead to delays in resolving complex issues, as these are often referred to human staff.*"

In summary, the challenges associated with implementing AI-powered chatbots at Al-Hikmah University span several dimensions, including human interaction, technical reliability, data security, and infrastructure, resistance to change, inclusivity, and system integration. Addressing these concerns will require a strategic approach that balances technological innovation with the preservation of quality and inclusivity in student support services.

Research Question 3: How do stakeholders' expectations and concerns about AI-powered chatbots differ across various roles in Al-Hikmah University?

Research Question 3 examines how stakeholders' expectations and concerns about AI-powered chatbots differ across various roles at Al-Hikmah University. The findings suggest that while stakeholders are generally optimistic about the potential of AI-powered chatbots to improve efficiency in student support services, their expectations and concerns are shaped by their specific roles within the institution.

One common expectation is that AI chatbots will alleviate the administrative burden by automating routine tasks. As one faculty member highlighted, "*AI-powered chatbots will help alleviate some of their administrative burdens, especially regarding repetitive tasks such as answering frequently asked questions about schedules, assignments, or examination information.*" This sentiment is echoed by university administrators who foresee the chatbot system optimizing resource use and offering 24/7 assistance to students, thus reducing pressure on administrative staff.

However, concerns about the impersonal nature of chatbot interactions were also frequently raised. A faculty member expressed worry that over-reliance on AI could undermine personalized academic guidance: "*I fear that students may rely too heavily on AI for academic advice, which could compromise the personalized guidance that faculty traditionally provide.*" Similarly, both postgraduate students and support staff voiced concerns about the limitations of AI in handling complex academic queries or emotional support. Postgraduate students, in particular, expressed doubts about the chatbot's ability to assist with advanced research or personalized academic matters: "*I am wary of over-reliance on AI, as I prefer human interaction for critical academic matters.*"

Data privacy was another recurring concern across stakeholders. University administrators specifically highlighted the importance of securing sensitive student data in the chatbot system. "*Data privacy is a key issue for administrators, particularly regarding how the chatbot will handle sensitive student data.*" IT officers, too, were concerned about cybersecurity risks and the potential for system failures. One IT officer noted, "*I am equally*

worried about the potential for technical glitches, system downtime, and the need for constant updates to keep the AI functional and relevant."

While there is a general acceptance of the efficiency that AI chatbots can bring, stakeholders are also wary about their integration into the existing university structure. For example, university administrators emphasized the need for proper alignment between AI systems and current workflows, as well as the potential cost of implementation. IT officers echoed these concerns, stressing the technical challenges of ensuring that the system operates smoothly within the university's infrastructure.

In terms of student interaction, undergraduate students appreciate the convenience of AI chatbots for accessing routine information like course registration and fees. However, concerns about the chatbot's ability to handle non-standard or complex queries were common: *"I am primarily concerned about the chatbot's ability to provide accurate and timely responses, especially for non-standard or complex queries."*

Support staff, while optimistic about the chatbot's potential to reduce their workload, expressed fears about the eventual displacement of their roles. One support staff member noted, *"I fear that AI could eventually replace some of their roles, particularly for routine tasks."* This concern was accompanied by apprehension about the challenges of transitioning to an AI-powered system and adapting to new technologies.

In conclusion, stakeholders' perspectives reveal both optimism and caution toward the adoption of AI-powered chatbots at Al-Hikmah University. While the potential for improved efficiency, enhanced student support, and streamlined administrative processes is widely recognized, concerns about data privacy, the impersonal nature of interactions, and the limitations of AI in addressing complex issues remain central. Addressing these concerns particularly around system integration, human interaction, and the accuracy of responses will be key to the successful implementation of AI-powered chatbots at the university.

Research Question 4: What are the factors to be considered for the successful integration of AI-powered chatbots into existing student support services at Al-Hikmah University?

The integration of AI-powered chatbots into the student support services at Al-Hikmah University requires careful consideration of various factors, as articulated by different stakeholders. Central to their views is the need for technical support, resource allocation, integration with existing systems, and user accessibility. These perspectives are crucial for ensuring the chatbot system's success in enhancing both academic and administrative functions.

A key theme that emerged from faculty members was the importance of seamless integration of the chatbot with existing Learning Management Systems (LMS). As one faculty

member emphasized, *"there is need for strong technical support to ensure the chatbot runs smoothly and can handle student inquiries without frequent breakdowns or errors."* This underscores the necessity for both technical support and faculty training to ensure the system's effective use for academic-related queries. Additionally, the chatbot should be regularly updated to provide accurate and timely information, particularly regarding academic records, timetables, and exam schedules.

University administrators highlighted the importance of resource allocation for the development, implementation, and maintenance of the chatbot system. As one administrator noted, *"sufficient resources are needed, including financial investment and technology infrastructure, to develop and maintain the system."* They emphasized that the chatbot must align with the university's broader goals, such as improving student engagement and academic performance. Furthermore, they pointed out the institution's readiness in terms of existing IT infrastructure and the willingness of faculty and staff to adopt new technologies as a key factor in the success of integration.

From the IT department's perspective, technological infrastructure plays a critical role in supporting the AI-powered chatbot. *"The existing technological infrastructure must be upgraded to accommodate the demands of AI-powered chatbots,"* one IT personnel emphasized. This includes improvements in server capacity, internet bandwidth, and data management systems. IT personnel also suggested that ongoing technical support is essential to resolve issues and ensure smooth operation. They recommended a dedicated team for maintenance and updates to keep the system running efficiently.

Students highlighted the accessibility and usability of the chatbot as key factors for success. One student remarked, *"the chatbot should be easily accessible through various platforms, including mobile phones, websites, and social media channels."* Ensuring that the chatbot operates 24/7 to assist with urgent queries, especially regarding admissions, results, and fee payments, was considered essential. Furthermore, students emphasized the need for transparency regarding how their data would be used and stored, ensuring that they receive clear communication about the chatbot's operations.

In summary, the integration of AI-powered chatbots into student support services at Al-Hikmah University requires attention to several interconnected factors. These include the need for strong technical support, adequate resources, effective integration with existing systems, user-friendly interfaces, and transparency in data management. By addressing these factors, the university can successfully leverage AI-powered chatbots to enhance student support services and achieve its educational goals.

5. Discussion

Based on first research question of the study, the findings highlighted several key benefits of AI-powered chatbots, with a particular focus on accessibility, efficiency, and scalability. One of the primary benefits identified is the enhanced accessibility and convenience that AI-powered chatbots offer. Stakeholders, especially students, emphasized that chatbots provide 24/7 access to support services, ensuring that students can access assistance outside regular office hours. This aligns with the Stakeholder Theory, which emphasizes the importance of addressing the needs and expectations of all stakeholders in the educational environment. In this context, students as key stakeholders benefit from the enhanced availability of support services, which improves their overall experience and satisfaction. The finding is consistent with Pérez et al. (2020), who found that AI chatbots significantly enhance service availability by providing immediate responses to student inquiries at any time, thus fostering positive stakeholder engagement. Moreover, the study revealed that AI chatbots are particularly effective in managing routine and repetitive tasks, such as answering frequently asked questions about registration, course schedules, and university policies. This efficiency enables human staff to focus on more complex and nuanced issues, aligning with the Technology Acceptance Model (TAM), which suggests that perceived usefulness and ease of use are key factors influencing the acceptance of new technologies. In this case, stakeholders, particularly students, acknowledged the potential of chatbots to streamline administrative processes, which reduces wait times and enhances their service experience. This finding resonates with Nouri et al. (2021), who found that AI chatbots can automate routine tasks, improving operational efficiency in educational institutions. From a TAM perspective, the chatbot's ability to perform these tasks effectively supports the perceived usefulness of the technology, thus enhancing its acceptance among both students and administrative staff.

Additionally, the study found that AI chatbots can collect and analyze data on student interactions, providing valuable insights for the continuous improvement of support services. Stakeholders highlighted the potential for chatbots to generate data-driven reports on trends and common issues, enabling universities to tailor their support strategies more effectively. This aligns with TAM's concept of perceived ease of use, as chatbots not only ease the process for students but also simplify data collection for administrative staff. Chen and Lee (2021) supported this finding, emphasizing that AI chatbots are valuable tools for gathering and analyzing data, which supports decision-making processes. This capability underscores the relevance of AI chatbots in enhancing the efficiency of university operations and improving the stakeholder experience by making services more responsive to student needs. Furthermore, the study found that AI chatbots can reduce the administrative burden on staff by handling routine queries and processing requests more efficiently. This reduction in workload allows administrative staff to focus on more strategic and complex tasks, ultimately improving their productivity and job satisfaction. This finding complements Smith and Johnson (2019), who reported that AI chatbots can alleviate the pressure on administrative staff by automating routine tasks. In terms of the TAM, this reduction in workload enhances the perceived ease of

use of the technology, as staff members can interact with the system in a way that streamlines their work processes, fostering a positive attitude toward the technology. Finally, the study highlighted the scalability and cost-effectiveness of AI chatbots, noting that stakeholders recognize the ability of chatbots to scale and handle increasing volumes of student inquiries without a proportional increase in staffing costs. This scalability makes AI chatbots a cost-effective solution for expanding support services in educational institutions, as evidenced by Zhang and Wang (2020). In relation to the TAM, the cost-effectiveness and scalability of AI chatbots increase their perceived usefulness and ease of use, thereby encouraging wider acceptance and integration of the technology in educational institutions.

In line with the second research question, the study explored the integration of AI-powered chatbots into student support services at Al-Hikmah University, identifying several challenges related to their implementation. These challenges can be better understood through the lens of Stakeholder Theory and the Technology Acceptance Model (TAM), which offer valuable insights into the perceptions and behaviors of key stakeholders involved in the adoption process.

One of the primary challenges highlighted by the study was the technical limitations and reliability of AI-powered chatbots. Students and staff reported concerns regarding system downtimes, inaccuracies in responses, and difficulties in integrating AI tools with existing university platforms. These technical concerns align with the TAM, which emphasizes perceived ease of use and perceived usefulness as critical factors influencing the adoption of new technologies (Han et al., 2022). As suggested by Zhang et al. (2021), the limitations of natural language processing (NLP) algorithms can contribute to inaccuracies, undermining the perceived usefulness of AI-powered chatbots. The integration of AI tools with legacy systems also presents barriers to adoption, as noted by Chen et al. (2023), who argue that poor integration may hinder the perceived ease of use, a key determinant in the TAM. Therefore, addressing these technical challenges is essential to improving the system's reliability and making it more user-friendly, which is vital for achieving greater acceptance among both staff and students. Privacy and security concerns were another significant challenge identified in the study. Both students and staff expressed apprehension about how their personal data would be collected, stored, and used by the chatbot system, highlighting the importance of user trust. The Stakeholder Theory suggests that the interests and concerns of all stakeholders, including students and staff, must be considered in the adoption process. Awan and Singh (2022) emphasize that trust in AI systems is heavily influenced by how personal data is managed, while Smith et al. (2023) stress the importance of adhering to data protection regulations, such as the General Data Protection Regulation (GDPR). From the perspective of TAM, concerns about privacy can affect users' perceptions of the system's ease of use and usefulness, leading to lower adoption rates (Venkatesh et al., 2003). Addressing privacy concerns through transparent data management practices and robust security measures is crucial to mitigating these fears and improving stakeholder trust.

Resistance to technological change was another challenge identified in the study, with both students and staff expressing reluctance to adopt AI-powered chatbots. This resistance can be linked to the TAM's construct of perceived ease of use, which posits that users are more likely to adopt technologies that they find easy to use (Han et al, 1989). The resistance to change observed in this study is consistent with Rogers' (2016) Diffusion of Innovations theory, which emphasizes that the perceived complexity of a technology influences its adoption. In the context of higher education, Ayub and Kaur (2022) argue that overcoming resistance requires effective change management strategies and targeted training programs to build user confidence and competence. From the perspective of Stakeholder Theory, it is essential to engage all stakeholders in the adoption process by addressing their concerns and providing the necessary support to foster positive attitudes toward the technology. Finally, concerns about the chatbot's ability to provide personalized and contextually relevant responses emerged as another barrier to adoption. Participants felt that AI chatbots might struggle to understand the nuanced needs of users, particularly in complex or sensitive situations. This issue relates to the TAM's constructs of perceived usefulness and perceived ease of use. As noted by Miller (2022), AI chatbots often fail to deliver contextually appropriate responses, which diminishes their perceived usefulness. Patel and Gupta (2023) also highlighted the gap between human-like empathy and machine-generated responses, suggesting that AI-powered systems are still far from achieving the level of personalization required for sensitive student interactions. To address this challenge, further advancements in AI, particularly in natural language understanding and contextual awareness, are needed to enhance the system's effectiveness and improve user perceptions of its usefulness.

In alignment with the third research question, the study explored the varying expectations and concerns of stakeholders at Al-Hikmah University regarding the implementation of AI-powered chatbots, highlighting how these perspectives differ according to their roles within the institution. The Stakeholder Theory provides a useful framework for understanding these divergent views, as it emphasizes that different groups of stakeholders have distinct interests, needs, and levels of influence on organizational decisions (Freeman, 1984). Faculty, students, and administrative staff, all of whom play critical roles in the university's ecosystem, hold different expectations about AI adoption based on their specific interactions with the system. Faculty members, particularly those involved in academic advising and student mentorship, expressed cautious optimism about the potential of AI-powered chatbots. Their expectations primarily focused on the chatbots' ability to streamline routine academic inquiries, such as course scheduling and assignment deadlines. This aligns with the Technology Acceptance Model (TAM), which suggests that perceived usefulness such as time-saving and efficiency enhances the likelihood of technology adoption (Han et al., 2022). The findings corroborate prior research that points to AI's potential to reduce faculty administrative burdens, enabling a stronger focus on pedagogy and research (Veletsianos, 2020). However, faculty also raised concerns about the limitations of chatbots in understanding complex academic contexts and facilitating nuanced intellectual discussions. This concern resonates with the TAM's notion of perceived ease of use, which suggests that the more challenging technology is to interact with

or understand, the lower the likelihood of acceptance (Han et al., 2022). Faculty feared that an over-reliance on AI systems might diminish students' critical thinking and problem-solving skills, echoing concerns about the over-automation of educational tasks and AI's limitations in fostering deeper cognitive engagement (Selwyn, 2019).

Students, by contrast, were largely enthusiastic about the potential for 24/7 access to support services through AI-powered chatbots. Their expectations centered on the convenience and immediacy that chatbots could offer, reducing wait times for academic advising, registration, and responses to frequently asked questions. This aligns with existing research, which emphasizes that students value the ease and accessibility of AI tools in educational settings (Winkler & Soellner, 2018). From a TAM perspective, the perceived usefulness of AI-powered chatbots in providing real-time assistance to students likely enhances their acceptance of the technology. However, students expressed concerns about the accuracy and reliability of chatbot responses, particularly for complex or non-standard queries. This apprehension points to perceived risks related to the technology, such as the fear of misinformation or administrative setbacks. The Technology Acceptance Model highlights the importance of perceived reliability and trust in determining the successful adoption of new technologies (Venkatesh & Bala, 2008), and these concerns emphasize the need for robust AI systems that can meet students' expectations for accurate information. The findings also tie into the broader discourse on the challenges of technology adoption in higher education, particularly in Nigerian universities, where infrastructural and technological constraints are prevalent. Okonkwo and Ade-Ibijola (2020) noted that these challenges may exacerbate fears about the potential for AI systems to fail, reinforcing the importance of ensuring that chatbots function efficiently and effectively to build stakeholder trust and foster adoption. This study contributes to the TAM by revealing how both perceived usefulness and perceived ease of use influence the acceptance of AI-powered chatbots in higher education settings. It highlights that faculty and students view AI technologies through different lenses, which must be addressed to facilitate broader acceptance. For faculty, improving ease of use and addressing concerns about AI's cognitive limitations could increase their comfort with its use in academic contexts. For students, ensuring the accuracy and reliability of chatbot responses will be crucial in enhancing the perceived usefulness and reducing resistance to AI adoption. These insights suggest that future implementations of AI-powered systems in universities must consider stakeholder expectations, provide adequate training and support, and ensure that the technology aligns with the diverse needs of all university stakeholders.

In response to the fourth research question, faculty members emphasized the necessity of robust technical support and infrastructure for the successful implementation of AI-powered chatbots. They highlighted that the chatbot system should be well-integrated with existing IT infrastructure and that ongoing technical support is crucial for addressing issues as they arise. This need for technical support aligns with both the Stakeholder Theory and the Technology Acceptance Model (TAM). According to the Stakeholder Theory, the interests and needs of all stakeholders must be considered in the decision-making process. Here, faculty and IT staff, as

key stakeholders, stress the importance of ensuring that the chatbot system integrates seamlessly with the university's existing infrastructure to guarantee its effectiveness and longevity. Furthermore, research by Lau (2018) underscores that the successful deployment of new technologies, such as AI-powered chatbots, depends on the robustness of technical infrastructure and support systems. In line with TAM, the perceived ease of use and usefulness of the technology will be influenced by the efficiency of this technical support, which in turn affects the system's acceptance by users. Faculty and students also emphasized the need for comprehensive training programs. Faculty members require training on how to effectively utilize the chatbot for academic inquiries, while students need education on how to interact with the chatbot and understand its capabilities. This aligns with TAM's assertion that perceived ease of use is crucial for user acceptance. According to Rogers (2003), user training is essential for overcoming the learning curve associated with new technologies. By addressing this learning curve, training programs can reduce resistance and enhance user satisfaction. The findings support TAM by suggesting that user competence, fostered through targeted training, enhances both perceived ease of use and perceived usefulness of the chatbot, facilitating its adoption.

In addition, stakeholders highlighted the importance of AI-powered chatbots being integrated with existing Learning Management Systems (LMS) and other academic platforms to maximize their utility. Integration with existing systems is key to ensuring that new technologies complement rather than disrupt established workflows. Tsai et al. (2019) found that successful integration of educational technologies depends on alignment with existing systems, and this is especially pertinent for AI chatbots. From the perspective of TAM, this integration can enhance the perceived usefulness of the chatbot system, as it will make the chatbot more efficient and capable of delivering value-added services that meet user needs, aligning with both faculty and student expectations. Taken together, these findings provide valuable insights into how the implementation of AI-powered chatbots at Al-Hikmah University could enhance student support services. Stakeholders, including university administrators, faculty, IT staff, and students, generally perceive AI-powered chatbots as having the potential to improve efficiency, accessibility, and responsiveness, particularly in academic advising, administrative assistance, and mental health services. However, concerns regarding implementation challenges—such as the adequacy of technical infrastructure, data security, and the need for comprehensive training—remain. These concerns reflect the importance of addressing both the technological and human-centered aspects of chatbot deployment. The study's alignment with TAM highlights the central role of perceived ease of use and usefulness in driving the acceptance and successful implementation of AI technologies. Additionally, the Stakeholder Theory's emphasis on stakeholder involvement underscores the importance of considering diverse perspectives in the design and implementation of new technologies.

Ultimately, this study contributes to TAM by emphasizing the influence of training, technical support, and system integration on the perceived ease of use and usefulness of AI-

powered chatbots. By addressing the concerns and expectations of different stakeholder groups, the study provides a nuanced understanding of the factors that can enhance or hinder the successful adoption of AI technologies in higher education.

6. Conclusion

This study has highlighted the complex viewpoints of stakeholders at Al-Hikmah University regarding the adoption of AI-powered chatbots for student support services. Stakeholders recognize the potential benefits of these chatbots, including increased efficiency, accessibility, and personalized support for students. However, significant concerns were raised about privacy, usability, and the need for adequate training and infrastructure to ensure successful implementation. These findings emphasize the importance of addressing stakeholder concerns and fostering an inclusive approach to the adoption process, ensuring that the technology aligns with the institution's goals and user expectations. The views gathered from this case study provide valuable guidance for higher education institutions considering the integration of AI-powered chatbots into their student support frameworks. By addressing the identified challenges and leveraging the suggested strategies for effective implementation, universities can harness the transformative potential of AI to enhance student experiences. Future research could explore the long-term impact of these technologies and examine their scalability across different educational contexts, contributing to a deeper understanding of their role in modernizing higher education systems.

7. Recommendations

Based on the findings of the study on stakeholders' perceptions of the potential benefits and challenges of AI-powered chatbots for enhancing student support services at Al-Hikmah University, the following recommendations are provided to guide the successful adoption and implementation of AI technologies in student services:

1. To ensure a smooth transition to AI-powered chatbots, it is recommended that universities, including Al-Hikmah University, adopt a gradual approach to implementation. This could involve the use of pilot projects in selected departments or services. By piloting the chatbot technology in specific areas, the institution can assess the effectiveness of the system, gather user feedback, and address technical or operational issues before a full-scale rollout.

2. A successful integration of AI-powered chatbots requires adequate training for all relevant stakeholders. Both administrative staff and faculty members should be trained on how to use and interact with the chatbot system effectively. Additionally, it is crucial to engage students in the process by educating them on the capabilities and limitations of AI-powered chatbots. Creating awareness of the system's benefits and encouraging feedback can foster acceptance and trust among the university community.

3. Stakeholders have raised concerns regarding data privacy and the ethical implications of AI-powered chatbots. To mitigate these concerns, it is important for Al-Hikmah University to establish clear data privacy policies and adhere to relevant regulations. The university should prioritize transparency by informing students and staff about how their data will be collected,

stored, and used. Implementing robust data protection measures and ensuring compliance with national and international data privacy laws will help build trust in the system.

4. While AI-powered chatbots can handle routine inquiries and tasks, they should not completely replace human interaction in student support services. It is essential to maintain a balance between automated responses and human oversight. For complex issues that require empathy, critical thinking, or personalized guidance, human staff should be available to intervene. The chatbot system should have an option for users to seamlessly escalate their inquiries to human support when needed.

5. To maintain the effectiveness of AI-powered chatbots, Al-Hikmah University should ensure that the system is continuously updated and improved based on feedback from users. Regularly collecting data on chatbot performance, including response accuracy, user satisfaction, and interaction patterns, will enable the university to refine the system. User feedback should be actively solicited, and improvements should be implemented to enhance the user experience and address any emerging challenges.

6. Universities should consider collaborating with AI experts, technology firms, and industry partners to ensure the chatbot system is state-of-the-art and tailored to the needs of the academic environment. Collaborations can provide technical expertise, resources, and innovation that are essential for the successful deployment of AI-powered systems in education. Partnering with external experts can also help universities stay updated on the latest AI trends and best practices.

7. A robust monitoring and evaluation framework should be established to assess the performance and impact of AI-powered chatbots on student support services. The framework should include clear metrics for evaluating system efficiency, student satisfaction, and the chatbot's contribution to service delivery. Regular evaluations will enable Al-Hikmah University to identify areas of success and those that require improvement, ensuring the long-term sustainability of the chatbot initiative.

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