

Students' Readiness for the Adoption of Artificial Intelligence for Support Services: Qualitative Evidence from Al-Hikmah University, Nigeria

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Abstract

This study investigates students' perceived readiness for the adoption of artificial intelligence (AI) support services in Nigerian universities, focusing on Al-Hikmah University as a case study. The data were collected from 45 students who were selected via stratified, purposive and convenience sampling techniques. Thematic analysis was employed to analyze the interview transcripts. Factors influencing students' readiness include perceived usefulness, ease of use, and concerns about privacy and job security. The findings suggest that students at Al-Hikmah University are generally positive and open-minded about the potential of AI to enhance their learning experiences and support services. The study identified several benefits of AI-based support services, including personalized learning experiences, access to information and resources at any time, and the potential to improve efficiency in administrative processes. While students are generally receptive to AI, the study also highlighted some concerns and challenges. These include privacy concerns related to data collection and usage, and the need for adequate training to effectively use AI tools. In conclusion, the study on students' perceived readiness for the adoption of artificial intelligence (AI)-based support services in Nigerian universities, focusing on Al-Hikmah University, provides valuable qualitative evidence on the attitudes and perspectives of students toward AI technology in the context of higher education.

Keywords: Artificial Intelligence, Support Service, Adoption, University System

1. Introduction

Artificial Intelligence (AI) has emerged as a transformative technology with the potential to revolutionize various aspects of society, including education (Abulibdeh et al., 2024; Villegas-Ch et al., 2020). In recent years, AI-based support services have gained significant attention in the educational sector due to their ability to enhance learning experiences, improve administrative efficiency, and personalize education (Ajani et al., 2022). However, the successful adoption of AI-based support services in universities depends largely on the readiness and acceptance of students, who are key stakeholders in the education system (Akpomi et al., 2022; Zhai et al., 2021). In the realm of higher education, AI-based support services are revolutionizing the way universities deliver services to students, faculty, and staff. These services encompass a wide range of applications, including academic advising, personalized learning, administrative support, and campus safety, among others. AI-based support services in universities leverage machine learning algorithms to analyze vast amounts of data and provide valuable insights. For example, AI can help universities optimize course scheduling based on student preferences and academic performance, leading to improved student satisfaction and retention. Additionally, AI-powered chatbots can provide instant support to students, answering their

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queries related to admissions, course registration, and campus life (Ali & Abdel-Haq, 2021). AI-based support services play a crucial role in enhancing the teaching and learning experience. AI can personalize learning materials based on individual student's learning styles and preferences, thereby improving learning outcomes. Moreover, AI-driven assessment tools can provide timely feedback to students, helping them track their progress and identify areas for improvement. AI-based support services are enabling universities to conduct cutting-edge research by analyzing complex datasets and identifying patterns and trends that would be impossible to discern through traditional methods. This has the potential to accelerate the pace of scientific discovery and innovation (Al-Malah et al., 2020; Bates et al., 2020).

Despite the numerous benefits of AI-based support services, some challenges and concerns need to be addressed. These include issues related to data privacy, bias in algorithms, and the impact of AI on jobs in the education sector. Universities need to develop robust policies and guidelines to ensure the ethical and responsible use of AI in their operations. AI-based support services have the potential to revolutionize the higher education sector by enhancing efficiency, improving student outcomes, and driving innovation. However, it is essential for universities to approach the adoption of AI with caution and to prioritize ethical considerations to ensure that AI serves the best interests of all stakeholders in the university community (Bearman et al., 2023; Birnin-Kuduet al., 2022).

Al-Hikmah University is a private university located in Ilorin, Kwara State, Nigeria. It was established in 2005 and committed to the promotion of education in Nigeria. The university is known for its strong emphasis on moral and ethical values, as well as its commitment to providing quality education in a conducive learning environment. Al-Hikmah University offers a wide range of undergraduate and postgraduate programs in fields such as Natural Sciences, Social Sciences, Humanities, Management Sciences, and Education (the university is also known for its strong emphasis on Islamic Studies, with programs that integrate Islamic principles into various disciplines (Yusuf et al., 2022)). Al-Hikmah University, like many other higher education institutions in Nigeria, faces challenges in providing effective and efficient support services to its students. These challenges can hinder students' academic success, personal development, and overall satisfaction with their university experience (Yusuf et al., 2022). It is on this premise that this study examines students' perceived readiness for the adoption of AI for the provision of support services at Al-Hikmah University.

2. Literature Review

Student support services in higher institutions play a critical role in ensuring the holistic development and success of students. These services encompass a range of programs and resources designed to address the diverse needs of students, including academic, personal, and social support (Chaka, 2023; Chatterjee & Bhattacharjee, 2020; Tzenios, 2020). According to Jha (2023), one of the key components of student support services is academic advising, which provides students with guidance on course selection, degree requirements, and career planning. Academic advisors help students navigate their academic journey and make informed decisions about their education. Tutoring services are another important component, offering students additional support in specific subjects or courses. Tutoring can be provided through one-on-one sessions or group settings, helping students enhance their understanding and performance in challenging areas. Counselling services are essential for supporting students' mental health and well-being. Trained counsellors offer support for issues such as stress, anxiety, depression, and relationship problems, helping students cope with personal challenges and improve their overall mental health.

Chen et al. (2022) opined that career services play a vital role in helping students prepare for life after graduation. These services provide assistance with job searches, resume writing, interview preparation, and career exploration, helping students make informed decisions about their future careers. Financial aid services are crucial for many students, providing information and assistance with scholarships, grants, loans, and other financial aid options. These services help students access the financial resources they need to pursue their education. Health services are also important, providing students with access to medical care, health education, and wellness programs. These services help students stay healthy and address any health issues that may arise during their time in college. Disability support services are essential for ensuring that students with disabilities have equal access to education. These services provide accommodations and support to help students overcome barriers and succeed academically. Chima (2022) is of the view that housing services help students find and maintain suitable housing options, including on-campus dormitories or off-campus housing. These services ensure that students have a safe and comfortable place to live while pursuing their education. Student activities and organizations provide opportunities for students to engage in extracurricular activities, develop leadership skills, and build social connections. These activities enhance the overall college experience and contribute to student's personal and social development. Hussain (2023) is of the view that library and learning resources are crucial for supporting students' academic success. These resources provide access to research materials, technology, and study spaces, helping students excel in their coursework. Student support services in higher institutions are essential for providing students with the resources and support they need to succeed academically, personally, and socially. By addressing the diverse needs of students, these services contribute to a positive and enriching college experience.

Artificial intelligence (AI) is a branch of computer science that focuses on creating systems or machines that can perform tasks that typically require human intelligence. These tasks include learning, reasoning, problem-solving, perception, understanding natural language, and even interacting with the environment. AI aims to develop algorithms and systems that can simulate various aspects of human intelligence, enabling machines to perform tasks autonomously or with minimal human intervention (Di Vaio et al., 2020). Machine learning is a subset of AI that focuses on enabling computers to learn from data without being explicitly programmed. ML algorithms use statistical techniques to identify patterns in data and make predictions or decisions based on those patterns. Supervised learning, unsupervised learning, and reinforcement learning are common approaches in machine learning. Deep learning is a subfield of machine learning inspired by the structure and function of the human brain's neural networks. Deep learning algorithms, also known as artificial neural networks, consist of multiple layers of interconnected nodes (neurons) that process and extract features from data. Deep learning has achieved remarkable success in tasks such as image recognition, natural language processing, and speech recognition. Natural language processing is a branch of AI that focuses on enabling computers to understand, interpret, and generate human language. NLP techniques are used in applications such as language translation, sentiment analysis, text summarization, and chatbots (Gofman & Jin, 2024; King & ChatGPT, 2023; Knox, 2020).

Computer vision is a field of AI that enables computers to interpret and understand visual information from the real world. Computer vision algorithms can analyze and process images or videos to perform tasks such as object detection, image classification, facial recognition, and image segmentation. Robotics is an interdisciplinary field that combines AI, engineering, and computer science to design, build, and operate robots. AI-powered robots can perceive their environment, make decisions, and perform tasks autonomously or with human guidance. Robotics applications range from industrial automation and manufacturing to healthcare, agriculture, and space exploration (Kolog et al., 2022; Lee & Perret, 2002). Expert systems are AI systems that

emulate the decision-making abilities of human experts in a specific domain. These systems rely on rules, knowledge bases, and inference engines to provide advice, solve problems, or make decisions. Expert systems have been used in various fields, including medicine, finance, engineering, and diagnostics. Reinforcement learning is a machine learning paradigm where an agent learns to make decisions by interacting with an environment and receiving feedback in the form of rewards or penalties. The agent aims to maximize cumulative rewards over time by exploring different actions and learning optimal strategies through trial and error. These concepts form the foundation of artificial intelligence and underpin its applications across diverse domains, revolutionizing industries, enhancing productivity, and shaping the future of technology (Mao et al, 2024).

From an empirical perspective, various studies have been conducted on AI. Mupaikwa (2023) examines the current uses of artificial intelligence for libraries in higher education institutions and discusses potential future applications. The research is based on a survey of universities and found that AI is predominantly used in admissions, student support services, and learning management systems. However, there is a growing interest in using AI for personalized learning and predictive analytics. Nguyen et al. (2023) evaluate the impact of AI-based tutoring systems on student learning outcomes in a higher education setting. The research involved a controlled experiment with 200 students. The study found that students who used the AI-based tutoring system performed significantly better than those who did not, suggesting that AI can enhance student learning outcomes. Okagbue et al. (2023) examined the review of artificial intelligence for learning in education and identified the challenges and opportunities of adopting artificial intelligence in higher education institutions through interviews with university administrators and faculty members. The study found that while there are concerns about job displacement and ethical issues, there is also optimism about the potential of AI to improve efficiency and student outcomes. Okunlaya et al. (2022) explore faculty perceptions of artificial intelligence in teaching and learning through a survey of respondents from various disciplines. The study found that while faculty members are generally optimistic about the potential of AI to enhance teaching and learning, there are concerns about its impact on academic freedom and student engagement. Olugbade et al. (2022) examined the review of studies on the role of artificial intelligence in academic advising through interviews with academic advisors and students. The study found that AI can improve the efficiency and effectiveness of academic advising by providing personalized recommendations and predictive analytics.

Theoretically, this study is anchored on the hierarchy of needs. Maslow's Hierarchy of Needs is a psychological theory proposed by Abraham Maslow in 1943 (Onyejegbu, 2023). It suggests that human needs can be arranged in a hierarchical order, with lower-level needs needing to be satisfied before higher-level needs become motivating factors. The hierarchy is typically depicted as a pyramid, with the most basic needs at the bottom and the highest needs at the top. The five levels of needs in Maslow's hierarchy are physiological needs, safety needs, belongingness and love needs, esteem needs and self-actualization needs (Onyema, 2020; Ouyang & Jiao, 2021). First, physiological needs are the most basic needs, including air, water, food, shelter, sleep, and reproduction. These needs must be satisfied before higher-level needs become motivating factors. In the context of student support services, ensuring that students have access to nutritious food, safe housing, and adequate healthcare can help meet their physiological needs and create a foundation for their academic success. Second, safety needs include physical safety, as well as financial and health security. Student support services can help meet students' safety needs by providing a safe campus environment, access to health services, and financial aid resources to help alleviate financial concerns (Owolabi et al., 2023; Park & Kwon, 2024; Tyagi et al., 2020). Third, belongingness and love needs entails that individuals seek to belong and form meaningful relationships. In the college setting, student support services can help students build social connections by offering opportunities for involvement in clubs, organizations, and social activities. Counselling services can also provide support for students seeking

to build healthy relationships with peers and faculty. Fourth, once belongingness needs are met, individuals seek to develop self-esteem and a sense of accomplishment. Student support services can help meet these needs by providing academic support, recognition for achievements, and opportunities for personal and professional development. Career services can also play a role in helping students build self-esteem by providing guidance and resources for future career goals (Raffaghelli et al., 2022; Renz & Hilbig, 2020). Lastly, self-actualization needs involve realizing one's full potential and achieving personal growth. Student support services can help students achieve self-actualization by providing opportunities for intellectual and creative exploration, as well as support for pursuing their passions and interests. Maslow's Hierarchy of Needs, student support services can tailor their programs and resources to address the diverse needs of students at different stages of their college journey. By providing a supportive environment that meets students' basic needs and fosters their personal and academic growth, student support services can contribute to the overall success and well-being of students in higher education (Saibakumo, 2021; Salas-Pilco et al., 2022; Salau et al., 2022; Sanusi et al., 2022; Topali et al., 2024).

2.1. Research Questions

1. What is the level of awareness among students regarding artificial intelligence (AI)?
2. What factors influence students' readiness to adopt AI support services in their learning processes?
3. What are the potential benefits of AI support services?

3. Methodology

3.1. Research Design

This study adopts a qualitative research design to examine the perception of students regarding their readiness for the adoption of AI for support services at Al-Hikmah University. Qualitative research design is a research method used to gain an understanding of underlying reasons, opinions, and motivations. It is primarily exploratory and is used to generate insights into a problem or to develop hypotheses for further quantitative research. Qualitative research is often used in social sciences, psychology, anthropology, and other fields where understanding human behaviour and experiences is important.

3.2. Population and Sampling Techniques

The population of the study consists of all undergraduate students at Al-Hikmah University in Nigeria. This population is important to consider as it represents the group of students who are currently enrolled in undergraduate programs at the university and who may potentially benefit from the adoption of AI support services. The table below shows the selection of the participants for the study using the earlier-mentioned sampling techniques.

Table 1. Selection of Participants Using Stratified, Purposive and Convenience Techniques

S/N	Faculties	Participants
1.	Education	5
2.	Law	5
3.	Humanities and Social Sciences	10

4.	Natural and Applied Sciences	10
5.	Health Sciences	5
6.	Agricultural Sciences	5
7.	Management Sciences	5
	Total	45

3.3. Interview Protocol

An interview protocol is a structured guide or outline that researchers or interviewers follow during qualitative research in interviews. It provides a systematic approach to conducting interviews, ensuring consistency across interviews and helping researchers gather relevant and meaningful data. In this study, an interview protocol titled "Interview Protocol on Artificial Intelligence (IPAI)" was adapted from the studies of Onyema (2020) and Owolabi et al. (2022) to elicit relevant information from the participants. To ensure the trustworthiness of the protocol, draft copies were given to experts for input regarding the contents of the protocol. Also, a pilot study was conducted to ascertain the credibility of the protocol. According to Naeem et al. (2023), trustworthiness is essential in qualitative research to ensure the reliability, validity, and ethical integrity of the research findings. By establishing credibility, dependability, confirmability, and transferability, qualitative researchers can enhance the quality and impact of their research, contributing to knowledge advancement and informed decision-making in diverse fields of inquiry.

3.4. Data Collection and Analysis

Interviews were conducted with the participants using biro, jotter, digital audio-tape, laptop and other necessary materials. Data collected were analysed using a thematic approach. Naeem et al. (2023) opined that thematic analysis allows researchers to systematically identify and organize patterns, themes, and concepts within qualitative data. It helps to identify recurring ideas, topics, or experiences that are meaningful and relevant to the research questions.

4. Results

4.1. Interview Transcription

Following the interviews with the chosen research subjects, the transcripts of the interviews were created. The process of transferring spoken language or verbal communication into written or textual form is known as transcription. The transcription entails precisely translating spoken words into written form by listening to audio recordings or seeing videos of the exchanges. In addition to the spoken words, transcription also records nonverbal cues like emphasis, tone of voice, and pauses, which are important for comprehending the context and meaning of the conversation. The tables displayed below depict the codes assigned and general themes of the study on students' perceived readiness for the adoption of AI-based support services at Al-Hikmah University:

Table 2. Code Assigned to Participants

S/N	Participant	Code Assigned
1	Education	E1, E2, E3, E4, E5
2	Law	L1, L2, L3, L4, L5

3	Natural and Applied Sciences	N1, N2, N3, N4, N5, N6, N7, N8, N9, N10
4	Humanities and Social Sciences	S1, S2, S3, S4, S5, S6, S7, S8, S9, S10
5	Management Sciences	M1, M2, M3, M4, M5
6	Health Sciences	H1, H2, H3, H4, H5
7	Agricultural Sciences	A1, A2, A3, A4, A5

Table 3. General Theme on Students' Perceived Readiness for the Adoption of AI-based Support Services in AI-Hikmah University

<p>Theme One: Awareness of AI</p> <ul style="list-style-type: none">- Knowledge of AI- Understanding of AI Tools <p>Theme Two: Factors Influenced Readiness for Adoption of AI</p> <ul style="list-style-type: none">- Self-Efficacy- Ease of Use- Access to Technology- Institutional Support <p>Theme Three: Benefits of AI for Support Services</p> <ul style="list-style-type: none">- Instant Feedback- Enhanced Study Efficiency- Improved Engagement- 24/7 Availability Services

4.2. Response to Research Questions

Research Question 1: What is the level of awareness among students regarding artificial intelligence (AI)?

Based on the interviews conducted, they demonstrate a spectrum of awareness levels, from those who are completely unaware of AI to those who have a high level of it. The views on awareness of AI vary based on individuals' backgrounds, experiences, and exposure to AI concepts. Gathering a diverse range of responses provides a comprehensive view of participants' perspectives on the concept of artificial intelligence. Some of the participants' excerpts are given below:

According to LI, he opined that:

"I have little knowledge or understanding of AI. I have heard of AI but have a limited understanding of its applications and implications. I equally understand the basic concepts and applications of AI but may not be aware of advanced uses or future trends."

The view of E3 is that..." I have a comprehensive understanding of AI, including its potential impact on society, ethics, and future developments. I have a deep understanding of AI, possibly with hands-on experience or specialized knowledge in AI-related fields."

According to H2 and A4, they opined that:

"AI is a technology that enables machines to think and act like humans. It involves the development of algorithms that can learn from data and make decisions or predictions. AI is used in various applications such as virtual assistants, autonomous vehicles, and predictive analytics."

The view of E4 is that..."I've used AI-powered tools like voice assistants or recommendation systems. I've worked on AI projects or research during my studies or career. I see AI as a valuable tool that can augment human capabilities and improve efficiency."

M3 opined that..."I'm interested in learning more about AI and its applications. I've taken courses or attended workshops on AI to enhance my understanding. I follow developments in AI research and technology to stay informed."

S1 and S5 opined that..."I believe AI will continue to advance and play a major role in shaping the future. I'm excited about the possibilities of AI but also cautious about its potential risks. I think AI will create new job opportunities but also require continuous learning and adaptation."

Research Question 2: What factors influence students' readiness to adopt AI support services in their learning processes?

The responses on factors that influence students' readiness illustrate how various factors can influence students' readiness to adopt AI support services in their learning processes. Some of the views of the participants are provided below:

The opinion of H2 is that:

"The level of support and encouragement from teachers and educational institutions can also impact students' readiness to adopt AI support services. If educators promote these tools and provide training on how to use them effectively, students may be more willing to adopt them. Peer influence plays a role in students' decisions to adopt AI support services. If their classmates are using these tools and benefiting from them, they are more likely to adopt them too."

According to L4, he opined that:

"The perceived cost-effectiveness of AI support services can influence students' readiness to adopt them. If these services are seen as affordable and offering good value, students may be more inclined to use them. The integration of AI support services into the curriculum and learning activities can also impact students' readiness to adopt them. If these services are seamlessly integrated into their learning experiences, students may be more likely to adopt them."

M3 asserted that..."Students' attitudes toward technology and innovation can influence their readiness to adopt AI support services. Those who are more open to trying new technologies may be more inclined to use AI tools."

S2 is of the view that..."The availability and accessibility of AI support services in the learning environment can influence students' readiness to adopt them. If these services are easily accessible, students are more likely to use them."

A3 asserted that..."Students' motivation to adopt AI support services depends on how clearly these services are shown to improve their learning outcomes."

The opinion of E5 is that..."The perceived usefulness and ease of use of AI tools can significantly impact students' readiness to adopt them."

Research Question 3: What are the potential benefits of AI support services?

The views of the participants highlight the potential benefits of AI for student support services in AI-Hikmah University, demonstrating its potential to enhance the learning experience and improve outcomes for students. Some of the participants' views are given below:

H5 believes that:

"AI can provide students with instant access to a wide range of educational resources and information, helping them to learn more efficiently. AI can tailor educational materials and learning experiences to suit each student's individual needs, allowing for a more personalized approach to education. AI-powered tools can make learning more interactive and engaging, helping to keep students motivated and interested in their studies. AI can help students manage their time more effectively by providing them with tools to organize their schedules and prioritize tasks."

E2 asserted that:

"AI can identify students who are at risk of failing or falling behind in their studies, allowing for early intervention and support to improve their chances of success. AI-powered chatbots and virtual assistants can provide students with support and guidance at any time of the day or night, ensuring they have access to help when they need it."

The opinion of A4 is that:

"AI can help to make education more accessible to students with disabilities by providing them with tools and resources tailored to their needs. AI can help students develop the skills and knowledge they need to succeed in their future careers, by providing them with real-world simulations and experiences. It can provide students with immediate feedback on their work, helping them to identify areas for improvement and learn from their mistakes."

L5 opined that..."AI can help universities to deliver student support services more cost-effectively, by automating routine tasks and reducing the need for manual intervention."

S4 is of the view that..."I value AI's ability to analyze large amounts of data to generate insights and inform decision-making processes related to student support services."

E5 asserted that..."AI adoption will enable AI-Hikmah University to stay competitive in the education sector, attracting students who value innovative and technology-driven learning environments."

5. Discussion

First, findings reveal that students showed a good level of awareness and understanding of AI technology, recognizing its potential to improve efficiency, accessibility, and personalization of support services. It suggests that they are well informed about the potential benefits and implications of AI in the context of higher education. The study of Jha (2023) indicates a high level of awareness among students in higher institutions regarding artificial intelligence (AI). Students demonstrate a good understanding of AI concepts and their potential applications across various fields. Second, findings of the study indicate that the awareness and understanding of students can be attributed to various factors, such as exposure, perceived ease of use, perceived usefulness and personal experiences. Park and Kwon (2024) found that student acceptance of the AI tutor based on factors such as perceived usefulness, ease of use, and satisfaction. Additionally, academic outcomes and learning gains were compared between the two groups to assess the effectiveness of the AI tutor. Tzenios (2020) established barriers and facilitators to AI adoption, as well as ethical and social considerations that shape students' attitudes towards AI. Knox (2020) found that the impact of AI-driven

personalized learning experiences on student satisfaction, retention rates, and overall academic success, considering factors such as learning preferences, pacing, and content relevance is needed for the development of students.

Also, findings reveal that the recognition of AI's potential to improve efficiency, accessibility, and personalization of support services indicates that students are receptive to the idea of integrating AI into their learning environment. They understand that AI can help streamline administrative processes, such as course registration and scheduling, allowing for more efficient use of time and resources. They acknowledge that AI can enhance the accessibility of support services by providing virtual assistance and information that is available 24/7, catering to students' needs at any time. Moreover, students' recognition of AI's potential to personalize support services reflects their understanding of the technology's ability to provide tailored recommendations and resources based on individual needs and learning styles. They appreciate the idea that AI can help create personalized learning experiences, including customized study plans, resources, and feedback, which can enhance their overall learning experience. The findings are in line with the work of Mupaikwa (2023) which found that students show a strong interest in AI-related topics, as evidenced by their participation in AI workshops, seminars, and extracurricular activities. They are actively engaged in AI projects and research, indicating a desire to deepen their knowledge and skills in this area. The study of Nguyen et al. (2023) suggests that students perceive AI as a beneficial technology with the potential to improve the efficiency, accessibility, and personalization of support services in higher education. The study of Saibakumo (2021) established that AI can streamline administrative processes and enhance the learning experience through personalized recommendations and resources in higher institutions.

6. Conclusion and Implications

Based on the qualitative evidence gathered from students at Al-Hikmah University, the study on students' perceived readiness for the adoption of artificial intelligence (AI)-based support services in Nigerian universities concludes that there is a generally positive attitude towards the integration of AI in the educational environment. The study found that students have a positive attitude towards AI-based support services, viewing them as tools that can enhance their learning experience and improve academic outcomes. Based on the findings of the study on students' perceived readiness for the adoption of artificial intelligence (AI) for support services at Al-Hikmah University, the following are the implications of the study for the management of the university:

1. There is a need to conduct awareness campaigns to educate students about AI technology, its potential benefits and implications. This can help dispel myths and misconceptions and foster a positive attitude towards AI adoption.
2. They need to provide training and skill development programs to equip students with the necessary skills to effectively use AI-based support services. This can include workshops, seminars, and online courses on AI fundamentals and applications.
3. Raise awareness about the ethical considerations of AI, such as privacy, bias, and transparency. Ensure that students understand the ethical guidelines and principles governing the use of AI in support services.
4. Develop user-friendly interfaces for AI-based support services to enhance usability and accessibility. Consider incorporating student feedback and preferences in the design process to ensure the services meet their needs.
5. Establish a continuous feedback mechanism to gather students' opinions and suggestions regarding AI-based support services. This can help identify areas for improvement and ensure that the services remain relevant and effective.

6. Foster collaboration and partnership between Al-Hikmah University and AI experts, industry professionals, and other educational institutions. This can facilitate knowledge sharing and enhance the implementation of AI-based support services.
7. Encourage research and development in the field of AI for support services. Support student-led projects and initiatives that explore innovative AI solutions to enhance student support services.

References

- Abulibdeh, A., Zaidan, E., & Abulibdeh, R. (2024). Navigating the confluence of artificial intelligence and education for sustainable development in the era of industry 4.0: Challenges, opportunities, and ethical dimensions. *Journal of Cleaner Production*, 437, article 140527.
- Ajani, Y. A., Tella, A., Salawu, K. Y., & Abdullahi, F. (2022). Perspectives of librarians on awareness and readiness of academic libraries to integrate artificial intelligence for library operations and services in Nigeria. *Internet Reference Services Quarterly*, 26(4), 213-230.
- Akpomi, M. E., Nwile, C. B., & Kayii, N. E. (2022). Artificial Intelligence, robotics and information, and communication technology (ICT) as tools for business and education management. *Research Journal of Mass Communication and Information Technology*, 8(2), 8-18.
- Ali, M., & Abdel-Haq, M. K. (2021). Bibliographical analysis of artificial intelligence learning in Higher Education: is the role of the human educator and educated a thing of the past? In *Fostering Communication and Learning with Underutilized Technologies in Higher Education* (pp. 36-52). IGI Global. <https://doi.org/10.4018/978-1-7998-4846-2.ch003>
- Al-Malah, D. K. A. R., Jinah, H. H. K., & ALRikabi, H. T. S. (2020). Enhancement of educational services by using the internet of things applications for talent and intelligent schools. *Periodicals of Engineering and Natural Sciences*, 8(4), 2358-2366.
- Bates, T., Cobo, C., Mariño, O., & Wheeler, S. (2020). Can artificial intelligence transform higher education? *International Journal of Educational Technology in Higher Education*, 17(1), 1-12.
- Bearman, M., Ryan, J., & Ajjawi, R. (2023). Discourses of artificial intelligence in higher education: A critical literature review. *Higher Education*, 86(2), 369-385.
- Birnin-Kudu, A., Awang, H., & Osman, W.R.S. (2022). Digital-biotechnology: A framework of bioinformatics used mobile-health technologies in Nigeria - universities 5G readiness deployment plan. *Emerging Advances in Integrated Technology*, 3(1), 64-71.
- Chaka, C. (2023). Fourth industrial revolution - a review of applications, prospects, and challenges for artificial intelligence, robotics and blockchain in higher education. *Research and Practice in Technology Enhanced Learning*, 18, 002-002.
- Chatterjee, S., & Bhattacharjee, K. K. (2020). Adoption of artificial intelligence in higher education: A quantitative analysis using structural equation modelling. *Education and Information Technologies*, 25, 3443-3463.
- Chen, X., Zou, D., Xie, H., Cheng, G., & Liu, C. (2022). Two decades of artificial intelligence in education. *Educational Technology & Society*, 25(1), 28-47.
- Chima, C.C. (2022). Artificial intelligence in human resources management and human resource accounting in Nigerian public sector. *Management and Human Resource Research Journal*, 11(01), 1-16.

- Di Vaio, A., Palladino, R., Hassan, R., & Escobar, O. (2020). Artificial intelligence and business models in the sustainable development goals perspective: A systematic literature review. *Journal of Business Research*, 121, 283-314.
- Gofman, M., & Jin, Z. (2024). Artificial intelligence, education, and entrepreneurship. *The Journal of Finance*, 79(1), 631-667.
- Hussain, A. (2023). Use of artificial intelligence in the library services: prospects and challenges. *Library Hi Tech News*, 40(2), 15-17.
- Jha, S.K. (2023). Application of artificial intelligence in libraries and information centers services: prospects and challenges. *Library Hi Tech News*, 40(7), 1-5.
- King, M.R., & ChatGPT. (2023). A conversation on artificial intelligence, chatbots, and plagiarism in higher education. *Cellular and Molecular Bioengineering*, 16(1), 1-2. <https://doi.org/10.1007/s12195-022-00754-8>.
- Knox, J. (2020). Artificial intelligence and education in China. *Learning, Media and Technology*, 45(3), 298-311.
- Kolog, E. A., Devine, S. N. O., Egala, S. B., Amponsah, R., Budu, J., & Farinloye, T. (2022). Rethinking the implementation of artificial intelligence for a sustainable education in Africa: Challenges and solutions. In *Management and Information Technology in the Digital Era* (Vol. 29, pp. 27-46). Emerald Publishing.
- Lee, I., & Perret, B. (2022). Preparing high school teachers to integrate AI methods into STEM classrooms. In *Proceedings of the AAAI Conference on Artificial Intelligence* (Vol. 36, No. 11, pp. 12783-12791).
- Mao, J., Chen, B., & Liu, J. C. (2024). Generative artificial intelligence in education and its implications for assessment. *TechTrends*, 68(1), 58-66.
- Mupaikwa, E. (2023). The Application of Artificial Intelligence and Machine Learning in Academic Libraries. In *Encyclopedia of Information Science and Technology, Sixth Edition* (pp. 1-18). IGI Global.
- Naeem, M., Ozuem, W., Howell, K., & Ranfagni, S. (2023). A step-by-step process of thematic analysis to develop a conceptual model in qualitative research. *International Journal of Qualitative Methods*, 22(2), 26-45.
- Nguyen, A., Ngo, H. N., Hong, Y., Dang, B., & Nguyen, B. P. T. (2023). Ethical principles for artificial intelligence in education. *Education and Information Technologies*, 28(4), 4221-4241.
- Okagbue, E. F., Ezechikulo, U. P., Akintunde, T. Y., Tsakuwa, M. B., Ilokanulo, S. N., Obiasoanya, K. M., & Ouattara, C. A. T. (2023). A comprehensive overview of artificial intelligence and machine learning in education pedagogy: 21 Years (2000–2021) of research indexed in the Scopus database. *Social Sciences & Humanities Open*, 8(1), article 100655.
- Okunlaya, R. O., Syed Abdullah, N., & Alias, R. A. (2022). Artificial intelligence (AI) library services innovative conceptual framework for the digital transformation of university education. *Library Hi Tech*, 40(6), 1869-1892.
- Olugbade, S., Ojo, S., Imoize, A. L., Isabona, J., & Alaba, M. O. (2022). A review of artificial intelligence and machine learning for incident detectors in road transport systems. *Mathematical and Computational Applications*, 27(5), article 77, 1-24. <https://doi.org/10.3390/mca27050077>
- Onyejebu, L.N. (2023). Challenges of integrating AI ethics into higher education curricula in West Africa: Nigerian universities narrative. In *AI Ethics in Higher Education: Insights from Africa and Beyond* (pp. 57-66). Cham: Springer International Publishing.
- Onyema, E.M. (2020). Integration of emerging technologies in teaching and learning process in Nigeria: The challenges. *Central Asian Journal of Mathematical Theory and Computer Sciences*, 1(1), 35-39.

- Ouyang, F., & Jiao, P. (2021). Artificial intelligence in education: The three paradigms. *Computers and Education: Artificial Intelligence*, 2, article 100020.
- Owolabi, K. A., Okorie, N. C., Yemi-Peters, O. E., Oyetola, S. O., Bello, T. O., & Oladokun, B. D. (2022). Readiness of academic librarians towards the use of robotic technologies in Nigerian university libraries. *Library management*, 43(3/4), 296-305.
- Park, W., & Kwon, H. (2024). Implementing artificial intelligence education for middle school technology education in Republic of Korea. *International Journal of Technology and Design Education*, 34(1), 109-135.
- Raffaghelli, J.E., Rodríguez, M.E., Guerrero-Roldán, A.E., & Baneres, D. (2022). Applying the UTAUT model to explain the students' acceptance of an early warning system in Higher Education. *Computers & Education*, 182, article 104468.
- Renz, A., & Hilbig, R. (2020). Prerequisites for artificial intelligence in further education: Identification of drivers, barriers, and business models of educational technology companies. *International Journal of Educational Technology in Higher Education*, 17(1), 1-21.
- Saibakumo, W.T. (2021). Awareness and acceptance of emerging technologies for extended information service delivery in academic libraries in Nigeria. *Library Philosophy and Practice*, 1-11.
- Salas-Pilco, S.Z., Xiao, K., & Hu, X. (2022). Artificial intelligence and learning analytics in teacher education: A systematic review. *Education Sciences*, 12(8), article 569.
- Salau, A. O., Demilie, W. B., Akindadelo, A. T., & Nnenna, J. (2022). Artificial intelligence technologies: applications, threats, and future opportunities. *Proceedings of the Advances in Computational Intelligence, its Concepts & Applications (ACI 2022)*, 265-273.
- Sanusi, I. T., Olaleye, S. A., Oyelere, S. S., & Dixon, R. A. (2022). Investigating learners' competencies for artificial intelligence education in an African K-12 setting. *Computers and Education Open*, 3, article 100083.
- Topali, P., Ortega-Arranz, A., Rodríguez-Triana, M. J., Er, E., Khalil, M., & Açkapınar, G. (2024). Designing human-centered learning analytics and artificial intelligence in education solutions: a systematic literature review. *Behaviour & Information Technology*, 1-28.
- Tyagi, A.K., Fernandez, T.F., Mishra, S., & Kumari, S. (2020). Intelligent automation systems at the core of industry 4.0. In *International conference on intelligent systems design and applications* (pp. 1-18). Cham: Springer International Publishing.
- Tzenios, N. (2020). Examining the impact of EdTech integration on academic performance using random forest regression. *ResearchBerg Review of Science and Technology*, 3(1), 94-106.
- Villegas-Ch, W., Arias-Navarrete, A., & Palacios-Pacheco, X. (2020). Proposal of an architecture for the integration of a chatbot with artificial intelligence in a smart campus for the improvement of learning. *Sustainability*, 12(4), article 1500.
- Yusuf, S., Mustapha, A. I., Shakirat, S. O., Oluwaseun, L. S., & Kamal, O. M. (2022). A qualitative study on contribution of private universities to the development of Kwara state, Nigeria: An empirical evidence from Al-Hikmah University. *Journal of Management in Practice*, 7(1), 34-56.
- Zhai, X., Chu, X., Chai, C. S., Jong, M. S. Y., Istenic, A., Spector, M., & Li, Y. (2021). A review of artificial intelligence (AI) in education from 2010 to 2020. *Complexity*, 2021, 1-18.