Examining the effects of Conversational Artificial Intelligence (CAI) on the Information-seeking Behaviours of University Students at the University of Ibadan, Nigeria.

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Abstract

This study explores how university students' information-seeking behaviours are transformed by Conversational AI. As digital resources multiply and artificial intelligence (AI) technology advance, libraries are looking for new and creative ways to improve user experiences and information accessibility. This study uses a mixed-methods approach to look at how CAI platforms, including chatbots and virtual assistants, affect undergraduate students' information-seeking behaviours. It combines qualitative and quantitative surveys and use descriptive statistics and theme for data analysis. The results provide insight into how CAI might improve user interaction with information resources, convenience access, streamline information retrieval procedures, and provide personalised help. The study also looks at possible challenges,accuracy of information, privacy concerns, over dependence, and implications for library services. Through shedding light on the intricate relationships between conversational AI technology and user behaviour, this study advances our knowledge of how information search and retrieval are changing academic libraries and helps to shape integration strategies for CAI within the scholarly information ecosystem.

Introduction

The rapid advancements and widespread adoption of smart technologies have ushered in an era characterized by artificial intelligence (AI), with AI-based conversational agents (CAs) being a prominent application in this field. In 1966, Weizenbaum pioneered the concept of a natural language text interface for human-computer interaction with his creation ELIZA (Weizenbaum, 1966). Since that time, a multitude of conversational agents have emerged (Følstad &Brandtzaeg, 2017; Gnewuch et al., 2017). Initially, these systems exhibited basic speech comprehension and lacked sophistication (Diederich et al., 2019a). However, with the rise of digital connectivity and technological advancements, CAs have permeated both households and businesses (Berg, 2015; Dale, 2016; Feng &Buxmann, 2020). AI-based conversational agents, like chatbots, are increasingly significant within organizations (Lewandowski et al., 2021), and Wang et al. (2020) noted their spread across various application domains, driving numerous innovations.CAs can be defined as systems that offer a natural language interface for integrating human and computer interactions. They typically employ artificial intelligence and connect to multiple data sources—such as databases and applications—to automate tasks or assist users in their work activities (Meyer von Wolff et al., 2019a). These conversational agents, often referred to as chatbots, are computer programs designed to mimic human conversations in text or spoken form (Tudor Car et al., 2020). They facilitate interactive, two-way communication and can cater to a diverse range of audiences, from children to older adults. CAs are commonly accessed through messaging apps, websites, mobile applications, or as standalone devices like smart speakers, utilizing various communication methods, including text, images, and voice.This functionality is enabled by natural language processing (NLP), an AI technique that allows computers to understand text and spoken language similarly to humans (IBM Cloud Education, 2020). NLP operates through "pattern matching" in natural language inquiries, simple statements, or semantic meanings (AbdulKader & Woods, 2015). The growing digital interconnectedness, along with advancements in machine learning and computational linguistics, is creating new application opportunities for CAs (Følstad &Brandtzaeg, 2017; Dale, 2016; Gnewuch et al., 2017). CAs are emerging as both social and AI-based actors that transform employee interactions with information systems within corporate communication structures (Maedche et al., 2019; Zierau et al., 2020a). Moreover, the increasing volume of information can contribute to employee workload and stress (Semmann et al., 2018). CAs hold the potential to assist with, solve, or automate tasks in work processes by organizing information, offering cognitive relief through identifying solutions, providing decision support, and promoting information

exchange to aid in vocational training (Meyer von Wolff et al., 2019a; Semmann et al., 2018; Stoeckli et al., 2019).Integrating conversational agents (CAs) into libraries can significantly enhance diversity, as these applications are capable of serving numerous patrons at any time, regardless of their location. Voice-based systems, in particular, assist users with visual impairments. CAs improve user-information systems by adding expressive capabilities to machines (Andre & Rist, 2000), allowing librarians to focus on more complex tasks rather than repetitive ones. For instance, having a chatbot retrieve information from a website can help familiarize users with that site, which is especially beneficial for novices who may feel overwhelmed by unfamiliar navigation—an issue frequently reported in library settings (McPherson, 2015).Conversational agents align with libraries' roles in information sharing and retrieval, enhancing social interactions by providing a virtual librarian experience. There is a need to explore the intersection of natural language systems further, as they have significant potential to benefit both library and information science professionals and patrons. Frederick (2016) notes that libraries have historically thrived during technological revolutions, and the integration of AI into library operations is expected to be a substantial boon for the library community. AI technologies, including robots, are increasingly adopted in university libraries to perform automated tasks (Tella, 2020). These libraries are leveraging CAs for information search, resource discovery, collection organization, knowledge discovery, big data analysis, metadata creation, search translation, and integrated searches across various content types. Thus, investigating the impact of conversational AI on information seekingbehaviours is particularly timely, as this technology continues to evolve and its usage is projected to increase.

Statement of the Problem

Traditionally, undergraduates have depended on human librarians for guidance in navigating library resources, developing research strategies, and locating specific information. The introduction of AI-driven conversational agents presents a new mode of interaction that could reshape these behaviours. Also, the growing integration of AI applications across diverse digital platforms has fundamentally transformed how individuals’ access and engage with information resources. While existing literature has explored the incorporation of AI technologies in library environments and identified various challenges, there remains a significant gap in empirical research examining how conversational AI influences university students’ information-seeking behaviours. Hence, this study aims to investigate the impact of conversational AI on the information-seeking behaviour of university students at the University of Ibadan, Nigeria.

Literature Review

McKie et al. (2022) examined long-term users of voice assistants in domestic settings, highlighting parallels between information behaviour studies and how the perceived personality of voice assistants impacts information retrieval. They noted the challenges users face when transitioning from text-based searches to voice interactions and advocated for expanding human information behaviour studies to encompass interactive conversational retrieval devices like voice assistants.Similarly, Gupta et al. (2020) discussed the applications and potential impact of artificial intelligence in academic libraries, identifying four key domains: educational, informative, assistive, and social networking. They suggested that libraries could leverage AI for various purposes, including reference services, emphasizing that the ultimate goal of chatbots is to streamline the functions of reference service units. According to Diederich (2019a) some researchers have even proposed using artificial conversational agents for reference interviews to re-engage users with library services. For instance, the University of Nebraska-Lincoln library launched one of the first AI Mark-up Language (AIML) based chatbots, known as Pixel, in the USA, which relies on pattern matching. Additionally, Canadian libraries have engaged in serious discussions about implementing chatbots and associated Human-Computer Interaction (HCI) techniques to enhance dedicated library services such as website navigation, digital reference interviews, and virtual storytelling (Talley, 2016).In addition, Kaushal and Yadav (2022) conducted an extensive qualitative interview study with research stakeholders at Indian universities, including librarians, professors, and doctoral students. They found that integrating chatbot technology with existing library information systems could offer diverse services, thereby enhancing research and scholarly communication. However, stakeholders expressed significant concerns regarding the perceived risks of using chatbots, particularly related to privacy issues and the complexity of tasks, which developers need to address.However, a collaborative initiative involving select Swiss public libraries, businesses, and information science student groups led to the creation of Kornelia, the first Swiss library chatbot and the first public library chatbot globally (McNeal & Newyear, 2013a). Also, a prototype library chatbot was developed at the University of Technology Sydney (UTS) following a thorough study of librarians' roles in crafting a friendly and trustworthy conversational design for such a chatbot (McNeal & Newyear, 2013b). Consequently, Wood and Evans (2018) conducted a survey of academic libraries in the USA in 2017, finding that 56.3% of academic librarians

believed that conversational AI (robotics) adoption would transform librarianship. This suggests that integrating conversational AI (robotics) in academic libraries could enhance user experiences significantly. Supporting this, Cotera (2018) argues that the implementation of conversational AI technologies in developed countries has revolutionized user experiences, making information more accessible, intuitive, and entertaining.In Singapore, many libraries are utilizing robots to assist staff with tasks like sorting returned books, shelf reading, and transporting materials, as noted by Liau (2019). This presence of robots in academic libraries allows librarians to dedicate more time to other essential tasks that improve library service delivery and user satisfaction.Furthermore, extant literature indicates that smart robotic technologies have been applied in various aspects as intelligent libraries, but to the best of researchers' knowledge, the existing literature did not address the impact of conversational AI technologies on university student information seeking behaviour.

Methodology

This research employs a descriptive survey approach to empirically assess the impact of conversational AI on the information-seeking behaviour of university library users. Data collection utilized an online questionnaire for its flexibility and accessibility, particularly suited for the target demographic of university students, who generally prefer digital formats over traditional paper methods (Denscombe, 2021). To maximize reach, personalized messages were disseminated through various student social media groups, particularly on WhatsApp. Follow-up reminders were sent periodically to encourage participation by clicking the provided link to the web form. Respondents were also informed about the expected duration of the questionnaire and what to anticipate.The questionnaire comprised 14 close-ended questions and 2 open-ended questions, organized into five sections. It included a cover letter and was created using Google Forms; the link was distributed across different student groups and platforms. The sample was drawn from a diverse population of undergraduate and postgraduate students. Nonprobability sampling was employed to facilitate an exploratory sample rather than a representative cross-section. To further enhance reach, a snowball sampling technique was used, where contacted students were encouraged to share the questionnaire within their networks, creating a ripple effect.Both sampling techniques aimed to gather rich insights from respondents across various academic levels, making them well-suited for exploratory research. There were no ethical concerns associated with the data collection and analysis, as no sensitive information was gathered, and the findings did not raise ethical issues. To ensure anonymity, no personal information, including email addresses, was collected. An informed consent form was provided at the beginning of the questionnaire,

clearly outlining the study's purpose and addressing potential concerns of respondents. The collected data were analysed using descriptive statistics with the IBM Statistical Package for the Social Sciences (SPSS).

Results

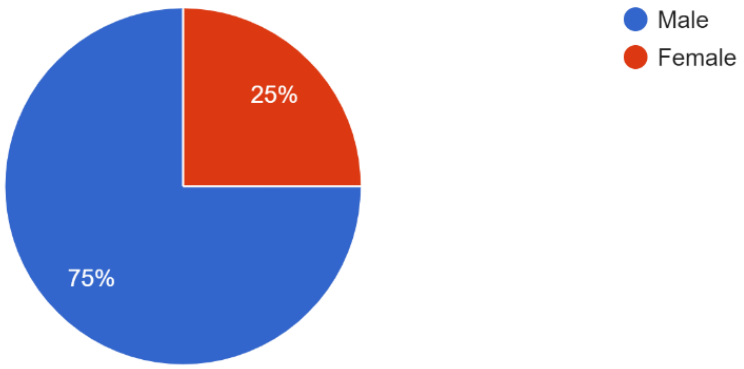

Figure1: Gender of respondents

The figure 1displays that 75% of the respondents were male and 25% were female. This demonstrates that male respondents account for a higher proportion of total respondents than female respondents, and postgraduate respondents account for a higher percentage of total respondents than undergraduate respondents.

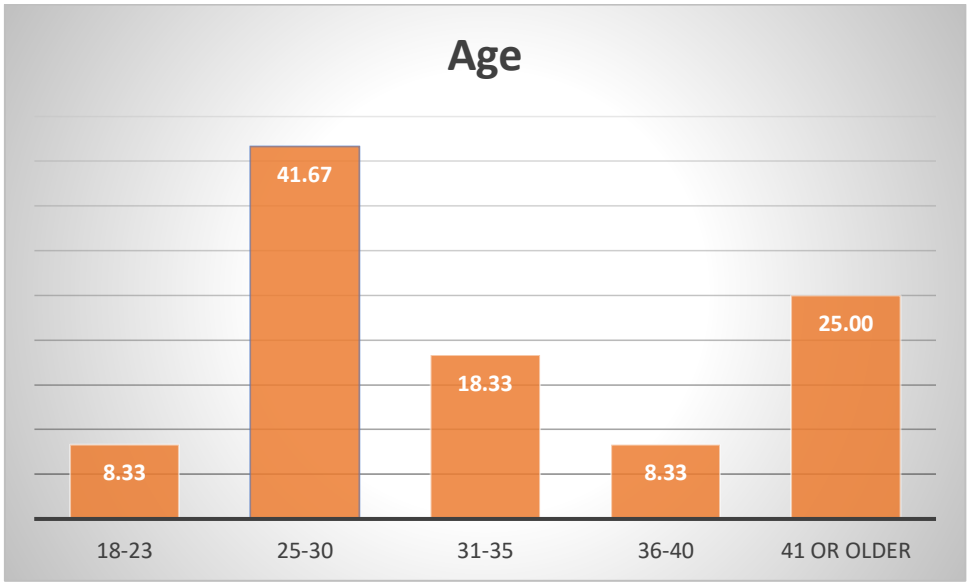

Figure 2: Age category of respondents

The figure 2 aboveshows that 41.67% of the respondents fall within the age of 25-30, 25.00% were 41 or older, 18.33% were 31-35, while both age 18-23 and 36-40 were 8.33%. This show that both graduate and undergraduate from 25 older active use converstional AI.

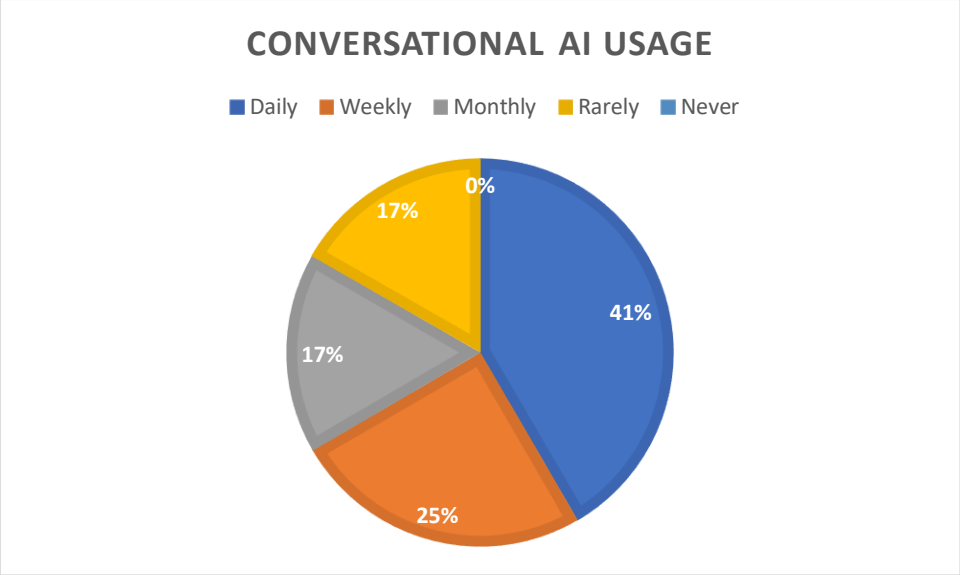

Figure 3: Conversational AI usage.

The responses in figure 3 shows that 41% a greater number accounting for both undergraduate and graduate students of the university of Ibadan; use conversational AI applications on daily, 25% on weekly, 17% on monthly basis and 17% of the student responses rarely use conversational AI applications.

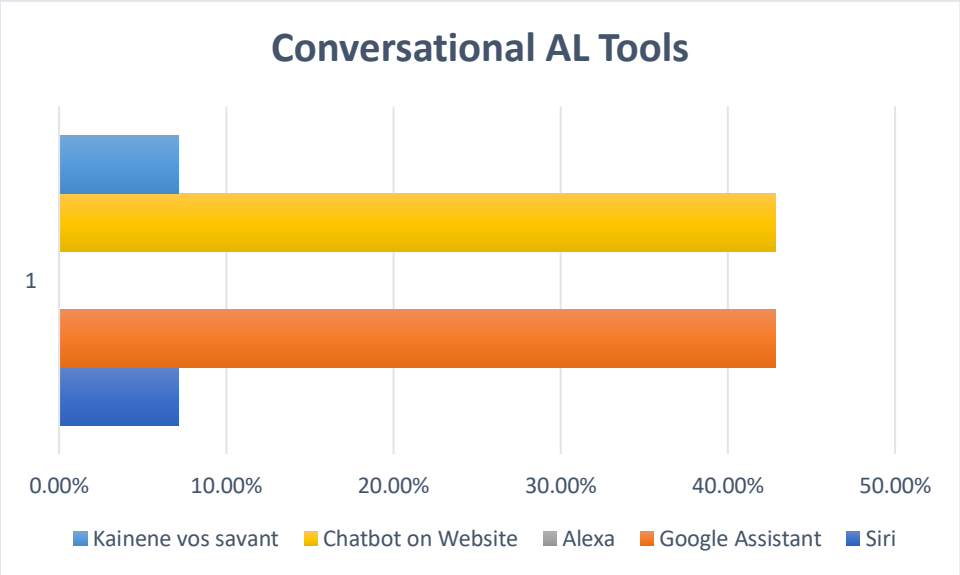

Figure 4: Conversational AI tools

This figure 4 show that42.87% of the respondents use chatbot on website, also 42.86% use google assistant, while 7.14% of the respondents use Siri and Kainen evos savant respectively. However, no students use Alexa. This reveals most student use conversational AI chatbot on website and google assistant for their information search.

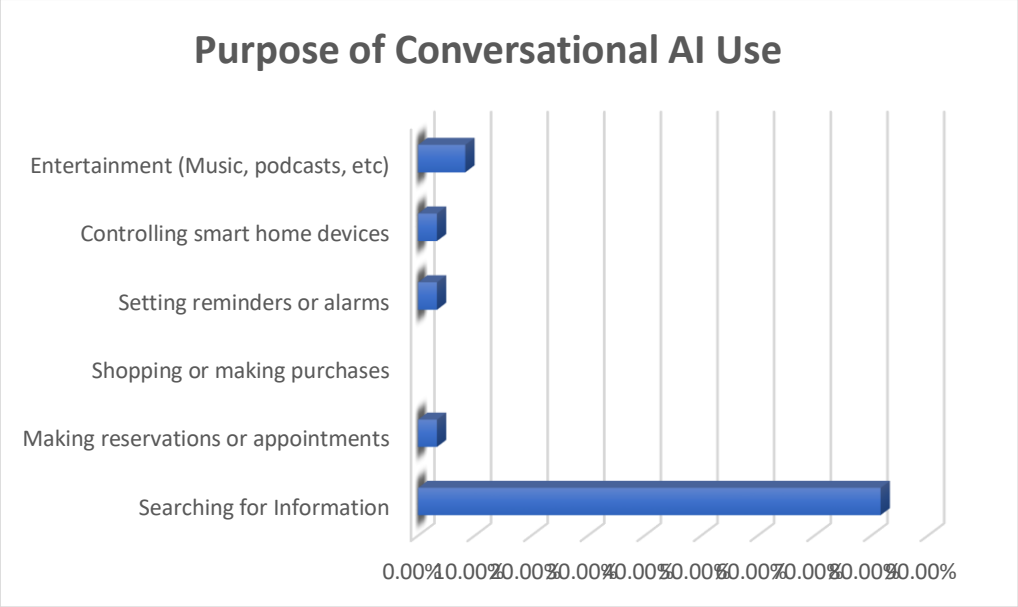

Figure 5: Purpose of conversational AI use

Figure 5 shows the reason for utilising conversational AI, which reveals that 81.66% of respondents used conversational AI for information searching. Respondents also use their conversational AI devices for entertainment, controlling smart home devices, setting reminder or alarm, and other activities. However, none of the respondents use conversational AI for shopping or purchasing.

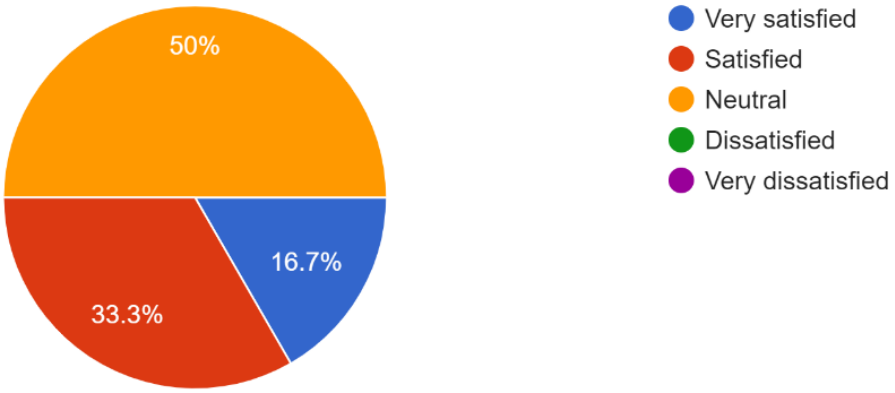

Figure 6: Accuracy of information provided by conversational AI

From the figure 6, 50% of the respondent remain neutral on the accuracy of the information provided by conversational AI; 33.3% are satisfied with the accuracy of information. While 16.7% are very satisfied with the accuracy of the information obtained.

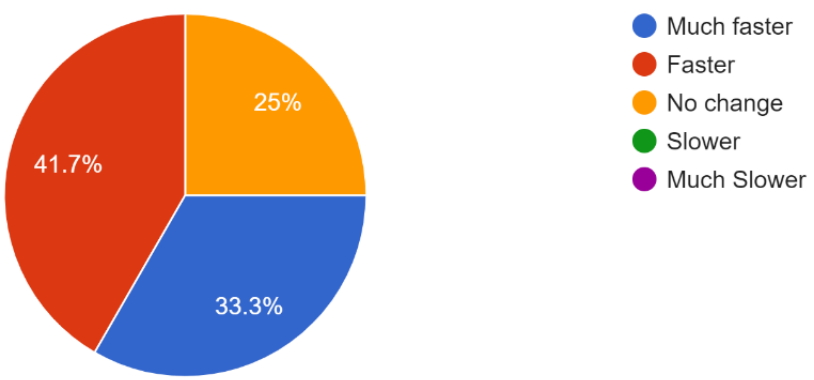

Figure 7: Conversational AI impact on the speed of information search

The figure 7 above shows that 41.7% of the respondent, representing a greater number agreed that the speed of information search with conversational AI is faster; 33.3% much faster. While 25% of the respondent agreed nothing has change.

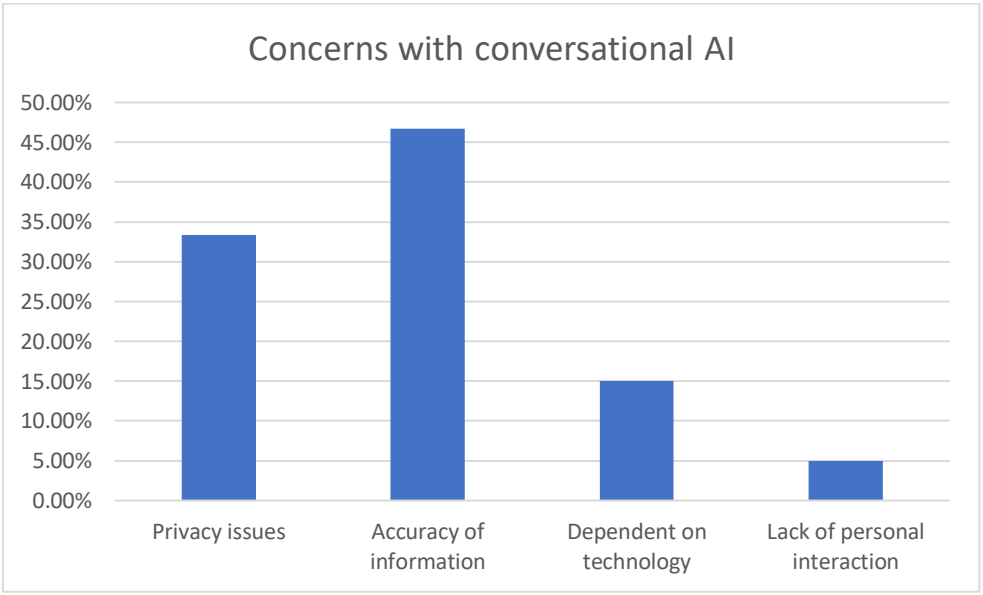

Figure 8: Concerns with conversational AI use

The figure 8 reveals that 46. 47% of the respondents were concerns with the accuracy of information obtained AI applications, privacy issues (33.33%,), dependent on technology (15%). While lack of personal interaction account for 5%.

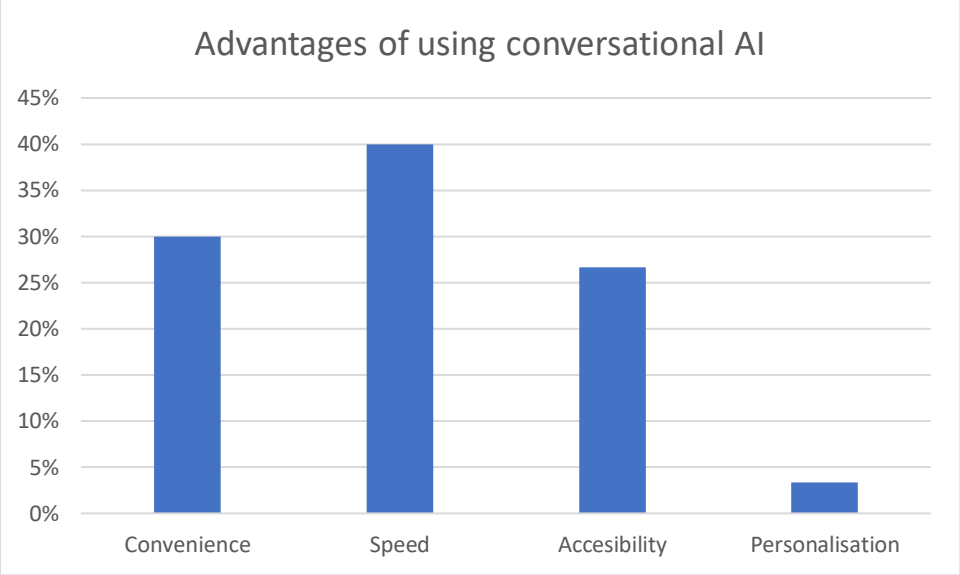

Figure 9: Advantages of using conversational AI

The figure 9 shows that 30%, 40% and 26.66% of the respondents affirm speed, convenience and accessibility as their biggest advantages of using conversational AI for information seeking.

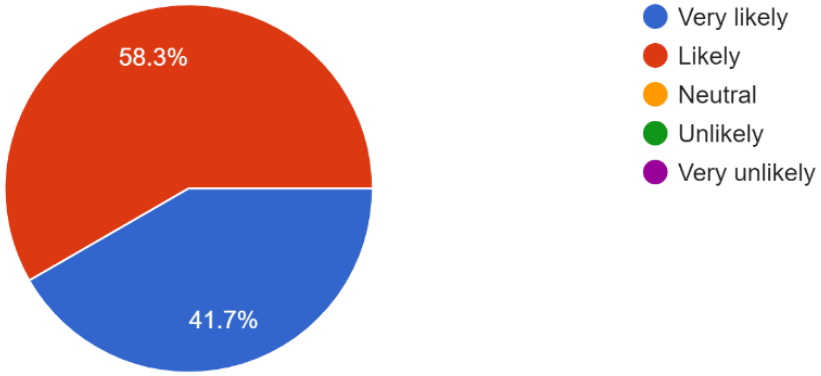

Figure 10: Future use of conversational AI for information search

The figure 10 shows that a greater percentage (58.3%) of the respondent are likely to use conversational AI for information search. While 41.7% of the respondent are very likely to use conversational AI for their information search. This imply that both postgraduate and undergraduate students embrace the use of conversational AI for their information search and retrieval.

Discussion of Findings

Findings revealed that majority of the respondents use conversational AI daily and weekly to search for information due to their accessibility, speed and convenience to use. Agreeing to Lukersiewic (2007) which observed that student, especially undergraduate are looking for

convenient, fast response and time saving as they move from using physical library collection to online. This shows that conversational AI significantly impact information seeking behaviour. It also indicates that conversational AI are used for academic information sources. This further reveal that both undergraduate and postgraduate students use conversational AI and traditional search engine for information search and prefer to use these applications to search for information resources.The results show that information users are willing to forgo content in exchange for convenience.Agreeing with (Muangnak et al., 2020), convenience is thus one of the primary criteria used for making choices; which includes the choice of the information source (is it readily accessible online or in print), the satisfaction with the source (does it contain the needed information and is it easy to use), and the time it will take to access and use the information source. Nowadays, most students do not have time to spend searching for information or learning how to use a new information source or access method. Hence, to be one of the first choices for information, library systems and interfaces need to keep pace with current technological development especially AI applications in library, and services provided by libraries should be easily available and require little to no training to utilise. As shows from the result, convenience is a key consideration for users of all demographic groups, and it is likely to continue being important in the future.

Three major concerns were revealed from the finding; the accuracy of information from conversational AI applications, privacy issues, and reliance on technology significantly influence student information-seeking behaviour. This is in tandem with Kaushal and Yadav (2022) finding on stakeholders concerns regarding the perceived risks of using chatbots, particularly related to privacy issues and the complexity of tasks, which developers need to address.The reliability of the information provided by conversational AI systems. Although conversational AI can offer quick responses, it may also produce inaccurate or misleading content, potentially undermining the quality of students' study. It’s important for students to recognize the possibility of errors and to verify information against trusted sources. Also, privacy issue remains a critical concern, as students might be hesitant to share personal data with conversational AI applications. The collection and usage of their information can create fears of surveillance or data misuse. Implementing strong privacy protections and clearly communicating how data will be handled can help alleviate these worries, thereby building greater trust in conversational AI applications. Furthermore, as students increasingly rely on AI for information seeking, questions arise regarding their critical thinking and research skills. With a growing expectation for quick answers, there is a risk that students might

overlook the importance of traditional information seeking methods and the critical evaluation of sources.

Conclusions

As reliance on digital tools for research grows, conversational AI can offer convenience, immediate access and enhancing the overall user experience; by providing real-time responses to enquiries;conversational AI such as chatbots can alleviate the frustrations often associated with navigating complex library catalogues and databases. This immediacy not only aligns with students' expectations for convenience but also encourages them to explore a broader range of resources, leading to more effective search practices. Additionally, conversational AI help bridge the gap for students who may feel intimidated by library resources. Thus, simplifying access to information and offering tailored guidance, these systems can empower students and boost their confidence in utilizing library services. However, challenges such as ensuring information accuracy, over dependent on technologyand privacy concerns remain, which negatively impact students’ willingness to engage with these technologies.

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