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ADOPTION OF CHATBOTS IN NIGERIAN HIGHER EDUCATION: PERCEPTIONS AND ACADEMIC UTILIZATION AT ADEYEMI FEDERAL UNIVERSITY OF EDUCATION, ONDO, ONDO STATE, NIGERIA

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Abstract

Chatbots had a global impact not long ago with their quiescent to transform education systems in countless ways. This study investigated into adoption of Chatbots in Nigerian higher education: perceptions and academic utilization, a study at Adeyemi Federal University of Education, Ondo, Ondo State, Nigeria. This study employed a descriptive survey design to collect and analyse data. The target population for this study comprised all undergraduates at Adeyemi Federal University of Education, Ondo, Ondo State, Nigeria. The respondents were selected using simple size consisted of 360 undergraduates selected from the five faculties in the University. 80 respondents were selected from the Faculty of Arts, 101 from the Faculty of Education, 60 from Faculty of Social Sciences and Management and 66 from Faculty of Vocational and Technical Education were selected respectively. The instrument for collecting data was the researcher's structured questionnaire titled "Adoption of Chatbots in Nigerian Higher Education: Perceptions and Academic Utilization Questionnaire." (ACNHEPAUQ). The instrument was validated by 3 experts. The reliability coefficient was obtained using Cronbach's Alpha and 0.85 values were obtained for perceptions and 0.88 values for the utilization of Chatbots for academic purposes. The research questions were analyzed using mean and standard deviation, whereas the hypothesis was examined through the Pearson Product-Moment Correlation (PPMC). The findings of the study revealed that undergraduates perceived the utilization of Chatbots for academic purposes and Chatbots was used effectively for academic purposes. Also, there was a strong relationship between the perceptions and utilization of Chatbots for academic purposes ($N=360$; $r=.117$, $P<0.05$). In the light of these findings, the study recommends that university administrations should develop Chatbots that will cater for undergraduates' needs and focusing on personalized learning experience, ease of use and valuable features that will enhance academic performance.

Keywords: Chatbots, Perceptions, Usage, Academic purposes, Undergraduates

Introduction

A Chatbot is a software application designed to stimulate text-based conversations between a user and a computer system (Vazquez-Cano et al., 2021). The idea that a computer could conversationally interact with humans originates from the foundational work of Alan Turing (Adamopolou & Moussiades, 2020). Turing & Haugeland (2004) viewed the capacity to communicate using language or test as a key indicator of intelligence, grounding this perspective in the philosophy of language, which emphasises the deep connection between language and thought. The development of intelligent Chatbots as conversational tools has been recognized as a clear milestone in the pursuit of technological advancement (Dale, 2016).

Right now, Chatbots have versatile applications across multiple sectors, including marketing, healthcare, tourism, and education (Smutny & Schreiberova, 2020). According to are utilized for numerous of educational activities (Vijayakumar et al., 2019). According to Reyes-Reina et al. (2020), chatbots can be identified based on four key characteristics. They possess the following features: (a) the ability to mimic conversation ; (b) interaction through text-based chat interfaces ; (c) absence of a physical form; and (d) lack of representation as a human figure in virtual environments. This characterization is helpful as it highlights that chatbots are not intended to replace humans, but rather to function as supportive tools for communication and interaction (Duncker, 2020). Chatbots can be seen as a particular form of educational object intended to perform a distinct educational functions through the reproductive of human speech in a Command-Line Interface (CLI) (FAO, 2021). One of the objectives of Chatbots in education is to uphold learning process (Vazquez-Cano et al, 2021).

Tamayo et al. (2020) enumerated some of the functions that a Chatbot can serve within the educational sector. They are: Intelligent tutoring system, improving student engagement, intelligent feedback, and immediate assistance to the students' alternative to learning management systems, teaching assistant, mentor and skills training. Also, Touimi et. al, (2020) report that Chatbots can effectively support the promotion of academic courses and facilitate learning processes; however, their current capabilities are still limited when comes to generating unrestricted conversational interactions. Massive Open Online Course (MOOCs) also provides sufficient data gathered from students inquiries can offer valuable insights for the development of future chatbots and for enhancing course design. However, to maximise their potential, these data sets should be integrated with advanced systems capable of handling and analyzing large-scaled data effectively. Topal et al. (2021) argued that while Chatbots may have a limited effect on enhancing students' academic skills directly, they do provide opportunities for students to engage in learning beyond the traditional classroom setting. Students obtained feedback from Chatbots and recognize them to be passionately thrilling and interactive learning materials. The Chatbots positively enhance the students' learning process and should be utilized where traditional education cannot work, as in the COVID-19 Pandemic.

Vazquez-Cano et al. (2020) noted that students tend to achieve improved outcomes in specific concepts when actively engaged, demonstrating higher levels of participation and finding the learning experience more enjoyable. It also promotes self-directed learning and enables the expansion of content delivery to accommodate larger audiences. They emphasized that well-structured instructional design is a key success, along with enhancing the capacity to engage with content that aligns with students' needs , ultimately fostering improved academic outcomes.

Rose (2023) lists various ways a Chatbot can be useful for teachers' work and students learning: Chatbots can be used to create outlines for essay. That is it will assist to deepen understanding of the topic and teach how to interact with Artificial intelligence (AI) models; it can customized instruction to specific learning method of individual students; Chatbots can assists to save time of teachers when preparing for a lesson. It can serve as an after-hours tutor; Chatbots can help with the emergence of ideas for activating students in the classroom (Rose, 2023).

Chatbots allows for sharing personal information and data, which is a serious concern. Educational Chatbots can gather very large amounts of data about students, potentially being used for informative and effective educational outcomes. (Mrsic, et al., 2020).

Alqaidi et al. (2021) reported that Chatbots can be used by students to ask a direct question. In lieu of allowing students to ask their questions directly, the student will be forced to find a Chatbots and type

out their questions instead. Also Chatbots is allowing students to communicate with one another from different locations and around their school campuses. (Mohd & Saiful, 2022).

Maeng et al. (2023) reported in their study that students regarded the use of Chatbots in learning English as highly advantageous, particularly those with prior experience using the technology, who demonstrated more favourable perceptions than their inexperienced counterparts. In the study of Lopez and Qamber (2022), participants expressed positive views about chatbots, highlighting their capacity to deliver immediate access to desired information at anytime and from any location. Dizon (2020) also noted that students' perceptions reflect the benefits associated with chatbots usage. Furthermore, integrating Chatbots into learning can boost students' motivation to engage in spoken communication and significantly enhance English language proficiency. In the study carried out by Lopez and Qamber (2022), it was reported that students found the use of Chatbots to be straightforward and user-friendly, emphasizing that accessing information through them was simple and hassle-free. And it was noted from their study that students' ability to utilise AI Chatbots to quickly access relevant information or responses and sourced from a wide array of databases without the need for manual searching, this is regarded as a major advantage. (Shin et al, 2023). Odin et al. (2024) in their research study on perceptions and use of AI Chatbots among students in higher education. It was found that students viewed AI Chatbots as extremely valuable and encouraging tools, particularly for serving as personal highly task assistants and for offering prompt feedback and support in areas such as writing, coding, and academic assignments.

Therefore, this study explores the integration of Chatbots within higher institutions in Ondo state, particularly at Adeyemi Federal University of Education, Ondo.

Statement of the Problem

The emergence of Chatbots has transformed the way people manipulate the technology and Nigerian higher education is no exception. Although, in spite of the growing adoration of Chatbots, their adoption in Nigerian higher education remains uncommon occurrence at Adeyemi federal University of Education, Ondo, (AFUED) Undergraduates and lecturers are faced with countless obstacles, including restricted access to information, insufficient support services and poor communication channels. The adoption of Chatbots could possibly address these issues. This study seeks to explore the perceptions and utilization of Chatbots for academic purposes at AFUED, Ondo. Moreover, the findings of the study are expected to add valuable insights to the existing body of knowledge. It will also assist to determine whether Chatbots can be an innovative catalyst in intensifying the academic experience in Nigerian Universities.

Aims and Objectives of the Study

The study aimed to explore and address the following research questions:

- 1) to investigate the perceptions of undergraduates using Chatbots for academic purposes.
- 2) to assess the utilization of Chatbots by undergraduates for academic purposes.
- 3) to examine the correlation between undergraduates' perceptions and their utilization of Chatbots for academic purposes.

Research Questions

The study sought and provided answers to the following research questions;

- 1) What are the perceptions of undergraduates using Chatbots for academic purposes?
- 2) How can Chatbots be utilized by undergraduates for academic purposes?

Research Hypothesis

The following research hypothesis was formulated and tested at a 0.05 level of significance.

- Ho₁. There is no significant relationship between the perceptions and utilization of Chatbots by undergraduates for academic purposes.

Methodology

The study adopted a quantitative research approach utilising the survey method through the administration of a structured questionnaire. This method was chosen due to its effectiveness in gathering data from a large population, allowing for efficient collection and analysis of relevant information. A simple random sampling technique was used for this research study and the population consisted all undergraduates at Adeyemi Federal University of Education (AFUED), Ondo, Ondo State, Nigeria. Five (5) faculties were used for this research study regardless of their area of specialization and gender. To ensure that every respondent had an equal opportunity of being included in the study, a fair and unbiased selection process was employed. A random sampling technique was adopted to select eighty (80) respondents from Faculty of Arts, Faculty of Education one hundred and one (101) respondents, Faculty of Social Sciences and Management Sixty (60) respondents, Faculty of Sciences Sixty six (66) respondents, and Faculty of Vocation and Technical Education Fifty three (53) respondents were selected respectively. In all three hundred and sixty (360) were selected for this research study. The primary tool for data collection in this study was a researcher - constructed questionnaire entitled "Adoption of Chatbots in Nigeria higher Education: Perceptions and Academic Utilization, ACUHEPAU". The questionnaire consists of two sections: Section "A" contain demographic data of the respondents and Section "B" contains items on undergraduates perceptions and usage of Chatbots for academic purposes in the universities in Ondo State. The instrument was on a 4-point scale of Strongly Disagree (SD), Disagree (D), Agree (A) and Strongly Agree (SA). The questionnaire was exposed to both face and content validity to check the appropriateness and adequacy of the content of the instrument. One lecturer from Department of Computer Science and two from Department of Educational Technology from Federal University of Technology, Akure, Ondo State validated the instrument. Their feedback and recommendations were incorporated to refine the questionnaire, resulting in the final version.

The questionnaire underwent testing for reliability in fifty (50) randomly selected undergraduates from Adekunle Ajasin University, Akoko, Ondo State, who were not part of this study. The data collected from the pilot test was analysed to assess internal consistency in reliability and Cronbach Alpha was used and the values obtained were 0.85 for perceptions and 0.88 for the usage of Chatbots by undergraduates. This demonstrated that the research possessed a high level of reliability.

The researcher with the help of research assistants in the five Faculties at AFUED, Ondo administered copies of e-questionnaire through the various social media platforms of the selected respondents.

At the conclusion of the process, three hundred and sixty (360) valid electronic responses were collected from the undergraduates, and the data were analysed using mean, standard deviation and Pearson Product Moment Correlation (PPMC) to address the research questions raised and test the formulated hypothesis for the study.

Results

Research Question 1: What are the perceptions of undergraduates using Chatbots for academic purposes?

Table 1: Undergraduates' perceptions towards using Chatbots for academic purposes.

Item	SA	A	D	SD	Mean	Std. D	Remarks
Chatbots can help to improve students' engagement in the lecture rooms/halls.	246	68	23	23	3.49	.87	Accepted
Chatbots can provide helpful feedback to students	247	68	22	23	3.50	.87	Accepted
I think Chatbots improves my learning outcomes	246	68	0	46	3.43	1.01	Accepted
Chatbots provides personalized learning experiences.	268	46	46	0	3.62	.70	Not Accepted
Chatbots can assist to bridge the gap between students and lecturers	269	45	46	0	3.63	.70	Accepted

Key; SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree

Decision Value for an Item: 0.00-2.49 = **Not Accepted**, 2.50 – 4.00 =Accepted

Table 1 lists the students' perceptions and the use of Chatbots for academic purposes. The students agreed to the following items: Chatbots can help to improve students' engagement in the lecture rooms/halls ($x = 3.49$), Chatbots can provide helpful feedback to students ($x = 3.50$), I think Chatbots improves my learning outcomes ($x=3.43$), Chatbots provides personalized learning experiences ($x =3.62$), and Chatbots can assist to bridge the gap between students and lecturers ($x=3.63$). Based on the results and mean accepted value, undergraduates' perceptions towards usage of Chatbots for academic purposes are: improves students' engagement provides helpful feedback, improves learning outcomes, and bridge the gaps between the students and lecturers.

Research Question 2: How Chatbots can be used by undergraduates for academic purposes?

Table 2: Usage of Chatbots by undergraduates for academic purposes.

Item	SA	A	D	SD	Mean	Std. D	Remarks
I use Chatbots in completing my class assignments	269	45	23	23	3.56	.87	Accepted
Chatbots have saved me time in completing academic tasks	292	23	22	23	3.62	.86	Accepted
I use Chatbots to ask direct questions	270	45	22	23	3.56	.87	Accepted
Chatbots make communication with one another from different places around the school campuses easier	271	89	0	0	3.75	.43	Accepted
I prefer using Chatbots over traditional learning resources.	271	66	23	0	3.69	.59	Accepted

Key; SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree

Decision Value for an Item: 0.00-2.49 = **Not Accepted**, 2.50 – 4.00 =Accepted

Table 2 shows the usage of Chatbots by undergraduates for academic purposes. The following were agreed upon by the undergraduates, according to the table. I used Chatbots in completing my class assignment ($\bar{x}=3.56$), Chatbots have saved me time in completing academic tasks ($\bar{x}=3.62$), I use Chatbots to ask a direct questions ($\bar{x}=3.56$), Chatbots make communication with one another from different places around the school campuses easier ($\bar{x}=3.75$), and I prefer using Chatbots over traditional learning resources ($\bar{x}=3.69$). Based on the results and mean accepted value, the usage of Chatbots by undergraduates for academic purposes are: assist in completing class assignments, saves time in completing academic tasks, enables to ask direct questions, makes communication easier and prefer using Chatbots over traditional learning.

Hypotheses Testing

Ho: There is no significant relationship between the perceptions and utilization of Chatbots by undergraduates for academic purposes.

Table 3: Summary of Pearson Product-Moment Correlation Showing Relationship between Undergraduates' Perceptions and Utilization of Chatbots for Academic Purposes

Variable	Mean	Std. D	N	r	Sig(p)	Remark
Perception	17.65	2.09		.117		
Utilization	18.18	2.11	360		0.27	Significant

Table 3 shows the relationship between undergraduates' perceptions and usage of Chatbots for academic purposes. The table indicates a strong and positive correlation between undergraduates' perceptions and usage of Chatbots for academic purposes which was statistically significant ($N=360$; $r=.117$; $P<0.05$). Hence, hypothesis 1 is rejected.

Discussion of Finding

This study explored the adoption of Chatbots in Nigerian universities and exploring the perceptions and usage for academic purposes by undergraduates. It was revealed the perceptions of undergraduates utilizing Chatbots can improve students' engagement, provides helpful feedback, improves learning outcomes and bridge the gaps between the students and the lecturers. This finding is consistent with the outcomes of earlier research conducted by Maena et al. (2023), Lopes and Qamber (2022), Odin et al, (2024), Dizon (2020), & Shin et al. (2023) who revealed that students used Chatbots mostly for academic purposes.

The second research question of this study highlighted the extent to which Chatbots were utilised by undergraduates for academic purposes. It was revealed that the use of Chatbots by undergraduates: assist in completing class assignments, save time in completing academic tasks, enables to ask direct questions, makes communication easier, and prefer using Chatbots over traditional learning. This agrees with the findings of Tamayo et al. (2020), Touimi et al. (2020), Tapal et al. (2021), Vazayez – Cano et al. (2020) & Rose (2023) who found that Chatbots have impacts on academic skill, it promotes autonomous learning and enables the flexible expansion of instructional content, can be used to create outlines for essay and allows sharing of personal information and data.

There is a strong relationship between undergraduates' perceptions and usage of Chatbots for academic purposes. Studies of Kim (2023) and Menon and Shilpa (2023) agrees with the finding of this

study that students' perceptions of Chatbots usefulness, ease of use, and value significantly influence their attitudes towards using the technology, which in turn predicts their acceptance and usage behaviour.

Conclusion

The incorporation of Chatbots into Nigerian Universities has significantly reshaped the educational landscapes, offering undergraduates a personalized, interactive, and supportive academic experience. As technology progresses, it is important for lecturers and developers to exploit the relevance of Chatbots, promoting a learning landscape that is engaging, effective and modify the students' needs. Accepting Chatbots, can open the door for new opportunities for academic success, empowering undergraduates to reach their potential and continue to increase in a progressively complex and ever-changing world.

Recommendations

Based on the study's findings, the following recommendations were proposed:

- 1) University administrations should establish Chatbots that will cater for undergraduates' needs, focusing on personalized learning experiences, ease of use, and valuable features that enhance their academic performance.
- 2) Lecturers and developers should promote the benefits and usefulness of Chatbots through organizing workshops, seminars and conferences and addressing misconceptions to foster positive perceptions and attitudes among undergraduates.
- 3) Lecturers should continuously evaluate and improve Chatbots effectiveness and ensure Chatbots remain relevant, and aligned with undergraduates' evolving needs.

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