

Evolving Trends of Chatbots on Students Skills and Knowledge Acquisition in Public Universities in Nigeria

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Abstract: *This paper is on evolving trends of chatbots on students skills and knowledge acquisition in public universities in Nigeria. University of Port Harcourt River State is among the public universities in Nigeria. Population of this study is 11,000 which comprised 5,000 males and 6,000 female students from University of Port Harcourt River State. Stratified random sampling technique was used to select 35 male respondents in mathematics, educational management and chemistry education departments in the Faculty of Education of University of Port Harcourt. On the other hand, 40 female students were selected from accountancy, Business Administration and Economics departments in the Faculty of management sciences of University of Port Harcourt. This gave a sample size of 225. Descriptive survey research design was used for this study. Two research questions guided this study. Instrument used for data collection was researcher developed questionnaire “titled, evolving trends of chatbots on students skills and knowledge acquisition in public universities in Nigeria” was used, with four rating scale of strongly agree, agree, disagree and strongly disagree. The instrument was validated by two specialists from Imo State University Owerri. Cronbach alpha statistics was used to determine the reliability coefficient of this study at 0.78 and 0.97, which shows that the instrument was reliable for use in this study. Mean scores were used to analyze the data. The finding from this study reveals that there are varied uses of chatbots by students in public universities in Nigeria. Those uses include: Graphic and digital graphic designs, students solutions to their assignments, tailored information that guide students on their research among others. In the same vein, challenges that constrain the uses of chatbots among students in public universities in Nigeria via ICT include: Frequent power outage, inability of students to afford ICT some resources and devices, inadequate internet broad band in some public universities in Nigeria. It was recommended in this study that government should provide adequate funding to public higher education institutions in Nigeria. This would enable public universities to install internet facilities, generators to override frequent power outages in public universities in Nigeria.*

Keywords: Modern Age Students, Uses of ICT in Hybrid learning, Modern World with Artificial Intelligence, Meaning of Chatbots, Impacts of Chatbots in Teaching and Learning.

Introduction

Education is an instrument for achieving economic, technological, physiological, social and political development. Education is receiving great attention in the whole world because of its economic, social, political and technological benefits people derive from it (Okoro, 2001). Education is imperative for both children and adults because it brings change to human behaviour. In this 21st century, education is the eye and the road to see the gains of the future (Anyaoagu, 2021). Education is pivotal for enhancing human creativity and innovation. It is a fulcrum for development of human intellect in skills and good thinking. Benefits derived from teaching and learning has made education a powerful tool that should be incorporated with technology for knowledge and skill development of people in different countries of the world (Ema, 2014).

Modern Age Students

Use of ICT has been the norm every adult of school ages have resolved to use ICT to practice learning. In this new age, uses of ICT tools and devices have surpassed traditional teaching method thus, ICT have refined teaching and learning in different classroom modes. ICT have unlocked the door or barriers of non- use of information and communication technology in teaching and learning (Wegerif & Major 2019). In this new age, ICT resources and facilities have enabled learners that make frequent use ICT facilities to be active learners, collaborative participants in classroom teaching and learning transactions.

Uses of ICT in Hybrid learning

Today, both face to face, virtual forms of classrooms are incorporated to ease effective delivery of instructions. On the other hand, AI has provide adaptive learning platforms to different levels of students. For example, students obtain information that helps them in their research work with use of AI tools. AI tools have helped lecturers to provide tailored teaching and learning to students. Students make use of AI to engage in interactive learning among themselves (Williams 2015). ICT facilities are configured to provide

students with tailored teaching and learning, transmission of academic messages and receipt of instant feedbacks on quiz and assignments (Morison, Lowther 2010, Lever –Duffy, & Mc Donald, 2011). In this 21st century, there is a paradigm shift from the old classroom to modern classroom. ICT resources and devices have unlocked the gates of knowledge (Srinivas, 2014). Students have accorded significant importance on ICT to a high esteem. Interpretation and clarification of concepts are made possible with ICT tools. Long hurdles of searching learning needs from textbooks are aided with ICT and internet services. Instant solutions to student's research work are carried out with use of ICT facilities and equipment.

Modern World with Artificial Intelligence

The world is a global village. Gone are the days when students depend on their teachers and lecturers as the only repositories of knowledge. In this era, the vogue is on frequent use of artificial intelligence for effective learning (Barrett et al, 2019). Many students have identified the efficacy of AI tools in achieving rewarding learning experiences. Chatbots have been so efficacious in analysis of concepts to students at home and student's comfortable self-study zones. Chatbots have immeasurably stood as aid to student's research work, personalized and collaborative learning needs. (Kowalski, 2013, Abbas, 2014, Fryer, 2017 & Roos, 2018). Lecturers send quiz to students. After solving the assignments, students return the assignment to lecturers via student's email and other social media platforms. Benefits derived from use of AI in teaching and learning cannot be over emphasized because AI tools have frequently provided rewarding learning experiences to students.

Meaning of Chatbots

There are various forms of AI tools. In this ICT world, chatbots have been very unique for student use in their learning. Chatbots are used for language translation or interpretations. Chatbots are among the AI tools, used for writing, recording and storing materials collected from other media. Lecturers derive unquantifiable benefits from using chatbots to extract materials or concepts required for student learning. Lecturers ensure that those materials extracted are synthesized or refined for effective teaching and learning outcome. Chatbots provide rewarding learning experiences in personalized and collaborative learning modes. Digital media such as laptops, desktops, and handsets, can be configured to enable students have access to AI learning tools (Abdel, Waki, Musharak 2019 & Holmes et al 2019).

Impacts of Chatbots in Teaching and Learning

Chatbots have been impactful in helping students develop deep and creative thinking thus, immense benefits are derived from learning with chatbots (Change et al, 2022). Students of this modern age are born in computer age. ICT is revolutionizing the world. ICT gave birth to use of AI tools. Students make use of ICT tools to write, read, draw, store, and retrieve data. Students of this new age speak the language of ICT. Students, also, practice writing skills with ICT tools, without hitches (Patel, 2023). Change is inevitable, both students and people in all works of life have embraced the change with use of technology in health, commerce, industry and education. Majority of students in different levels of education are consistently making use of ICT thus, mediating student learning difficulties with use of artificial intelligence (Change, 2022). In this new age, students have developed abilities on use of different media such as audio, visual, audiovisual materials in their learning. Students of this new generation are explorers, experientialists, evaluators, analysts, designers and improvisers. They can confidently subscribe for the best AI tools to ease their learning. Chatbots as AI tools, assist learners in both face to face, mobile, flipped and hybrid classroom (Issa, 2020). Students adapt to any teaching and learning environment, be it at home, schools or student comfort zones where there are internet broadband and steady use of electricity (Monova- Zheleva, 2005 & Essel et al 2022). Students can innovate, share, transmit, store, and trade data with many information dissemination software's, and engage in digital education dialogue with use of emoticons (Rouse, 2015 Ventura et al 2018 & Holmes et al 2019). ICT comprised all media incorporated to transmit audio, video, data and multimedia information for students and other interested users (Perron, Taylor, Glass & Margerum- leye 2010).

Unprecedented demands for ICT have uplifted the use of AI tools. ICT and its AI mediated tools have progressively aided learning thus, subordinating the use of moribund and antiquated machines that have not endeared 80% academic needs in the past decades. The world is now a global village and AI is taking the lead. In industries, AI has been very beneficial in writing and correcting business letters, aiding accurate records of business transactions, generating accurate business data, detection of crimes and aiding forensic audit analysis (Okeke, 2005). In health organizations, they are machines for detecting fractured bones, nerves and intestines. In pharmaceutical industries, AI machines are used for drug synthesis and refining. In social and events centers, images, relics, portraits, motion pictures are designed with AI tools. AI tools, adorn our environment thus, providing bubbles of happiness to creative works. Enough cannot be said of AI. In Architecture, AI tools are pencils for designing buildings. In academic writings, AI tools provide eruditions to academic scholars on well written articles and lecture materials.

Students engage into explorative and experiential learning with AI tools (Cisco 2008). AI tools highlight areas of learning students have done very well and areas they did not do well thus, helping students to be aware of different areas of their learning that required

more improvements. Students can confidently write their quiz with chatbots. Chatbot enables students to engage in practical learning. Chatbots are academic software s that enables students to get feedbacks from their academic work. Student solves their quiz and examinations at the comfort of their homes with chtabots. Chatbots provides good teaching and learning assistance to lecturers and students. In this 21st century, the hurdles of traveling far distances to learning institutions have reduced, today; students can receive instant messages for their academics and send backs or solved messages to their lecturers for validations. However, different needs of students on their courses are aided with Chatbots. The importance of Chabots cannot be over emphasized. Chatbots have aided students to plan and actualize their personal and group academics goals. Students acquire information on all activities of their educational institutions and stay on tracks without deviating from their studies. Bad hand writing or bad writing skills are no more the matter. Students write and solve questions with the help of AI tools preferably with the use of chatbots. Solutions to issues under debate are solved with AI tools. Students of this new age, obtain rewarding learning experiences with use of chabots. Word or language translations in foreign languages are made simple with Chatbots. Different animations, letters, pictures, shapes and the likes, are made possible with chatbots. The word is now a global village. Avalanche of students learning, designs, productions are made simple and possible with Chatbots. Chatbots eases effective communication, thus, fostering collaborative learning that are ideals for students learning or engagement.

Statement of the Problem

Chatbots have offered learning assistance to students in varied forms. Many students cannot do without Chatbots because; they have opened very significant roads maps for students learning. in the same vein, ICT have exhumed the efficacy of Chatbots on effective students learning. On the other hand, there are challenges constraining the use of ICT facilities in public universities in Nigeria. Those Challenges include: Inadequate technologists to effect repairs on faulty ICT facilities, inadequate funding for installation of ICT facilities by federal and state government in Nigeria, frequent power outages, inadequate robust policy on use of ICT in public universities, lack of internet broad band in some public universities, inability of some students and lecturers to embrace change with use of ICT facilities and equipment. Vast array of change on use of ICT facilities also, constrain the use of chatbots in public universities.

Methods

This paper is on evolving trends of chatbots on students skills and knowledge acquisition in public universities in Nigeria. University of Port Harcourt River State is among the public universities in Nigeria. Population of this study is 11,000 which comprised 5,000 males and 6,000 female students from University of Port Harcourt River State. Stratified random sampling technique was used to select 35 male respondents in mathematics, educational management and chemistry education departments in the Faculty of Education of University of Port Harcourt. On the other hand, 40 female students were selected from accountancy, Business Administration and Economics departments in the Faculty of management sciences of University of Port Harcourt. This gave a sample size of 225. Descriptive survey research design was used for this study. Two research questions guided this study. Instrument used for data collection was researcher developed questionnaire “titled, evolving trends of chatbots on students skills and knowledge acquisition in public universities in Nigeria” was used, with four rating scale of strongly agree, agree, dis agree and strongly disagree. The instrument was validated by two specialists from Imo State University Owerri. Cronbach alpha statistics was used to determine the reliability coefficient of this study at 0.78 and 0.97, which shows that the instrument was reliable for use in this study. Mean scores were used to analyze the data.

Results

Research Question One:

What are the skills students derived from Chatbots in public universities in Nigeria?

Table 1: Shows the skills students derive from use of Chatbots in public universities in Nigeria.

S/NO		Mean	Remarks
1.	Chatbots provide students with step by step solutions on their learning concepts.	3.10	Agree
2.	Students use chatbots to ask	3.00	Agree

	questions and receive immediate feedbacks that addressed their research p		
3.	Chatbots helps students to adapt to personalized learning styles, making learning contents available to students.	3.10	Agree
4.	Chatbots serves as virtual tutors to students, offering enough guidance to students learning on various courses.	2.90	Agree
5.	Students use chatbots to solve Their assignment.	3.30	Agree
6.	Students receive feedbacks on grades given by their lecturers on their assignment.	3.20	Agree
7.	Instructions on how students can improve in their learning are provided with chatbots.	4.00	Agree
8.	Chatbots provide tailored Learning concepts to students.	3.30	Agree
9.	Students can study with the use of chat boards at the comfort of their homes.	2.70	Agree
10.	Chatbots offer immediate assistance to students on	3.40	Agree

students various learning styles.

Decision

The means in table 1: above were very higher to the decision rule of 2.5. This proved that the benefits students derive from use of chatbots is significant.

Research Question two:

What are challenges of chatbots in public universities in Nigeria?

S/NO	Respondents	Mean	Remarks
1.	Power Outages	3.20	Agree
2.	Cost of ICT resources Resources	3.10	Agree
3.	Internet fluctuations	3.30	Agree
4.	Inadequate provision of ICT tools in public universities.	2.60	Agree
5.	Inadequate funding in public universities.	2.70	Agree
6.	Insufficient digital skills among educators.	3.10	Agree
7.	Lack of clear policy On use of ICT in public Universities.	3.00	Agree
8.	Digital skill gap among lecturers and students	3.30	Agree

9.	Resistance to use of ICT facilities among students.	3.20	Agree
10.	Lack of qualified personnel to effect repairs on ICT facilities.	3.50	Agree

Decision

The means in table 1: above were very higher to the decision rule of 2.5. These revealed enormous skills students have acquired from use of Chatbots. On the other hand, the mean scores on challenges of uses of ICT facilities were above the decision rule of 2.5. These revealed significant challenges of use of ICT facilities in public universities in Nigeria.

Recommendations

1. Nigerian government should provide adequate ICT facilities in public universities in Nigeria. This would encourage students to have access to more AI tools in their learning.
2. Nigerian government should provide uninterrupted electricity in public higher education institutions in Nigeria. This would reduce resistance some student develop with the use of ICT facilities to enrich themselves with AI tools.

Discussion of Findings

Chatbots have enriched students learning in both personalized and collaborative learning forms. The finding from this study revealed that Chatbots assists learners in both face to face, mobile, flipped and hybrid classrooms. Media such as lap tops hand sets and desk tops assist learners to have enriched benefits with use of Chatbots as AI tools. On that note, (Abdel, Waki, Musharak 2019 & Holmes e tal 2019), identified that digital media such as lap tops, desktops, and handsets, can be configured to provide AI tools. Chatbots are useful to any level of students be it students in primary, secondary and tertiary education (Change, 2022) averred that majority of students in different levels of education are consistently making use of ICT which provide enabling grounds on use of artificial intelligent AI, to ease their learning. Chatbots have outstanding remarks in providing assistance to students learning especially during preparations for semester examinations, post fields research work. (Kowalski, 2013, Abbas, 2014, fryer, 2017 & Roos, 2018) maintained that chatbots have been so efficacious in analysis of concepts taught in the classroom. They further explained that student's Chatbots provide significant aid to students research work, personalized and collaborative learning needs. Students acquires varied learning aid from the use of Chatbots in their different spheres of learning (Rouse, 2015, Ventura, 2018 & Holmes e tal, 2019). Opined that students can share, transmit, store, trade data with many information dissemination software's, and engage in digital education dialogue with their classmates with Chatbots.

Conclusion

Chatbots have provided enormous rewarding learning experiences to students. Students immediate access to their learning needs with Chatbots have enable students to remain indefatigable in their learning. Varied solutions chabots have provided to students learning have compelled both fast and slow learners to develop deep and creative thinking to their studies. Chatbots have been so efficacious in analysis of concepts thought in the classroom, student's research work, personalized and collaborative learning needs. (Kowalski, 2013, Abbas, 2014, fryer, 2017 & Roos, 2018).

References

- Abbasi, S & Kazi, H. (2014). Measuring the Effectiveness of Learning Chatbot Systes on Student's Learning Outcomes and memory Retention. *Asian Journal of Applied Science and Enginneering*, 3, 57- 66. Chatbots helps students to adapt to any teaching and learning environment, be it at home, schools or any other comfort zone of students where there are internet broad band and steady use of electricity (Monova- Zheleva, 2005 & essel e tal 2022).
- Al-Wazzen, M.S. (2019)Can Digital Mind Mapping with Collaborative Enhanced Learning in Saudi Primary Schools?[Doctoral Dissertation, Durham University]. Durham e-thesis. <http://etheses.dur.ac.uk/12975/>.
- Anyaougu, R.O. (2021). Educational Management and Supervision in a digital World: Emerging Perspectives. Bon Publications .Owerri.

- Barret, M. Branson, L Carter, S. Deleon, F. Ellis, J. Gundiache, C. & Lee, D. (2019). Using artificial Intelligence to enhance Educational Opportunities and Students Services in Higher Education. *Inquiry: The Journal of the Virginia Community Colleges*, 22(1), article 11. [http:// commons.vccs.edu/inquiry/Vol22/iss/11](http://commons.vccs.edu/inquiry/Vol22/iss/11).
- Change, C.Y. ,Kuo, S.Y., & Hwang, G.H.(2022). Chatbot- facilitated Nursing Education: Incorporating a Knowledge- based Chabot System into a Nursing training Program. *Educational Technology and Society*, 25(1), 15-27. <http://www.jstor.org/stable/48647027>.
- Cisco Systems, Inc. (2008). Transforming to 21st Century Pedagogy. Retrieved 23th December, 2014 from <http://www.cisco.com/web/about/citizenship/cisco-economic/docs/pedagogy-EAP-RI.pdf>.
- Emah, I.M. (2014). Strategies for Curriculum Content Development in U.M.O. Ivowi (Ed). Curriculum teaching in nigeria. Lagos Foremost Education Services Ltd.
- Fryer, L.K.Ainley, M. Thompson, A. Gibson, A.A. & Sherlock, Z. (2017). Stimulating and Sustaining Interest in a Language Course: An Experiment Comparison of Chatbot and Human TaskPartners. *Computers in human Behavior*, 75,461-468. <http://doi.org/10.1016/ichb2017.05.045>.
- Holmes, W Bialik, M & Fadel, C. (2019). Artificial Intelligence in education: Promises and Implication for teaching and Learning. *The Center for Curriculum Redesign*. <https://bit.ly/48PVLdD>.
- Monova- Zheleva, M. (2005). Adaptive Learning in Web-Based Education environments. *Cybernetics and Information Technologies*,5(1), 44-55. https://cit.iict.bas.bg/CIT_05/v5-1/44-55.pdf.
- Roos, S. (2018). Chatbots in Education. Appraising Trend or a Valuable Pedagogical Tool?[Master’s Thesis, Upsala University].
- Wegerif, R. & Major, L.(2019). Buber, Educational Technology and the Expansion of Dialogic Space. *AI and Society*, 34, 109-119. <https://doi.org/10.007/s00146-018-0828-6>.
- Lever-Duffy, J.& Staker, H.(2011).Teaching and learning with technology(4th ed). Boston Pearson.
- Morrison, G.R.& Lowther, D.L. (2010). Integrating Computer Technology into the Classroom: Skills for the 21st Century(4th ed). Boston: Pearson.
- Srinivas, H. (2014). Collaborative Learning:44 benefit of Collaborative Learning. Retrieved 27th December, 2014 from <http://www.gdrc.org/kmgmt/c-learn/44.html>.
- Rouse, M. (2015). Information and Communication technology (ICT). Retrieved from December 7, 2025, [http: //wwwthejournal.com/magazine/vault/artificleprintversion.cfm?aid4344](http://wwwthejournal.com/magazine/vault/artificleprintversion.cfm?aid4344).
- Perron, B.E. Taylor, H.E., Glass, J.E & Margerum- Leye, J.(2010). Information and communication Technologies in Social Work. *Advances in Social Work. International Journal of Science Research and Reality*. 11(1)67-81.
- Okoro, C.O.(2001). The relevance of Curriculum Development to National Building in Nigeria. *Journal of Curriculum and Instruction. National Association of Curriculum Theorists(UNACT)*.
- Okoroeke, L.C. (2000). Principles and Practice of Auditing and Investigations. A manual for Professionals and Non –Professionals. Lima Publishers, Lagos State.
- Williams, C. & Adesope,Y.R.(2015). Explorative of ICT software in Modern Classroom *International Journal of Academic Research and Reflection*, 4(1), 15-22. www.idpublication.org.