

# Journal of English Language and Pedagogy (JELPA)

Vol. 2, No. 2, November 2024, Page 92-100 P-ISSN: 2988-2826 | E-ISSN: 2987-8225



# **ChatGPT and English Language Pedagogy in Nigerian Universities: Sensemaking and Assessments**

# **Bolajoko Margaret Tunde-Awe**

Adekunle Ajasin University, Nigeria

Corresponding Author: <a href="mailto:bolajokotundeawe@gmail.com">bolajokotundeawe@gmail.com</a>

#### **Article History:**

Submitted: 26/10/2024 Revised: 04/11/2024 Accepted: 11/11/2024

## **Keywords:**

Assessment; ChatGPT; Language Educators; Nigerian Students; Sense-Making **Abstract.** Technology such as ChatGPT is central to effective instruction in English as a Second Language (ESL) pedagogy. However, language educators and students must have a shared understanding of its prospects to be used successfully in an academic setting. While extant studies have established its proliferation among students, this study investigated the sense-making of language educators as regards ChatGPT and its implications on assessment practices. A descriptive research design of the survey type was adopted for this study. The population of the study were forty-three university language educators and five hundred and five pre-service teachers who were purposively selected from two higher institutions in Ondo State, Nigeria. Self-structured questionnaire titled: Sense-making of ChatGPT among Language Educators Questionnaire (SCLEQ: r = 0.87) and Students' Utilization of ChatGPT Questionnaire (SUCQ: r = 0.81). Three research questions were answered in this study. Findings revealed that students, to a very great extent, use ChatGPT to ace their essays (~x=3.7) but then again, there is a gap-in-knowledge regarding its uses among university language educators (x=1.8). On the basis of these findings, the study recommended that language educators should get acquainted with AI tool and its applications in ESL pedagogy and also be creative on the best assessment mode given the reality on the ground.

**Citation:** Tunde-Awe, B. M. (2024). ChatGPT and English Language Pedagogy in Nigerian Universities: Sensemaking and Assessments. *Journal of English Language and Pedagogy (JELPA)*, 2(2), 92-100. https://doi.org/10.51826/jelpa.v2i2.1307.

## **INTRODUCTION**

The crucial role of language learning cannot be overstated. Language learning furnishes learners with cross-cultural communication skills and opens a new portal to knowledge in other languages other than the learners' L1. In Nigeria, for instance, English is the official language and formal education language. English was historically bequeathed to Nigeria and other West African countries colonized by Britain. Therefore, a typical Nigerian has two major tools (language) of thoughts – the L1 (Hausa, Igbo or Yoruba) and English. For mutual intelligibility, concerted efforts have been made to produce learners who would be proficient not only in the learner's L1 but also in English due to its global status. However, the traditional English language pedagogy as practiced in Nigeria has not aided the realization of this objective. The onus of transforming the state of English language pedagogy in Nigeria. Therefore, places a demand on Language educators to keep abreast with advanced technological innovations such as ChatGPT which is believed to have the potential of enhancing English language teaching/learning in Nigeria. ChatGPT (Chat Generative Pre-trained Transformer), a form of AI developed by OpenAI, is an advanced language



model that allows people to interact with a chatbot that is capable of generating coherent and compelling human-like answers in response to a question or statement (UNESCO, 2023). Tlili, et al, (2023a) describe it as a conversational agent based on Natural Language Processing (NLP) that engages users in a human-like conversation. OpenAI (2023) further reveals that ChatGPT can provide answers to follow-up questions, admits mistakes, challenges incorrect premises, and rejects inappropriate requests. Similarly, García-Peñalvo (2023) added that ChatGPT is flexible and could be manipulated to interpret languages, summarize texts, and respond to specific inquiries, however, Alejandro, Giovanna, Javier, Haydeé, Marco, Guillermo, Hugo, Rosa, Herbert and José (2023) suggested that ChatGPT generated data should be verified before being used. Some researchers have revealed that ChatGPT has great potential in language learning, especially in higher education (Santandreu et al. cited in Adarkwah, 2023) while some hold a contrary opinion and perceive it as a destructive tool (Adarkwah, 2021, and Santandreu, et al, 2023). While it is needful to continuously integrate new technology in English as a Second Language (ESL) pedagogy, we must take cognizance of the drawbacks of any technology, especially those that may negatively impact assessment practices in higher education. Therefore, the first variable of concern is the English language educators' sense-making of the AI tool.

Sense-making examines perception-expectation gaps among individuals (Namvar, Cybulski, Phang, Seng Ee, Liang Tan, 2018). In today's digital world, there is a swell utilization of ChatGPT among Nigerian students but its uses among English language educators is still shrouded in mystery – what it is; how it works and the skills needed to engage with it for teaching and learning. And therefore, when there is a perception gap in knowledge on the part of English language educators, several issue may arise ranging from students' outpacing of teachers, through students' over-reliance on AI-generated essays to increased unethical use of AI. Therefore, in this study, examining English language educators' understanding of ChatGPT, its basic functions and ability to detect ChatGPT's nuances in students' essays constitute sense-making. Since its proliferation among Nigerian tertiary students, ChatGPT seems to have become a top cheating aid, as it is not uncommon to find traces of its use in their assignments and essays (Bonsu & Baftour-Koduah, 2023). Students now rely on ChatGPT for their academic work, so creativity is ebbing away due to over-reliance on the tool. If the gap in knowledge regarding the use of ChatGPT among English language educators and students is not balanced, language assessments in Nigerian universities would continuously remain otiose exercises.

According to Tontus (2020), assessment is basically concerned with the "gathering of information from various sources and activities in order to have a deep understanding of what students know, understand and can do with their knowledge as a result of their educational experience". An assessment is a crucial part of teaching/learning processes. It provides feedback to both the teacher and the learners on learning progress. Different assessment formats measure learners' language proficiency, and promotion to next grade is done or certificates issued after completion of a prescribed language course. Assessments also are used to identify individual student weaknesses and strengths so that educators can provide specialized academic support educational programming, or social services. In this case, we may be driving at "assessment for learning" as against "assessment of learning". Nonetheless, when language assessment modes become compromised, such as students' turning-in ChatGPT generated essays as theirs, they cannot be relied on for decision making.

A few studies have investigated the use of ChatGPT among tertiary students; Thadphoothon (2023) with the use of Google form examined 41 students in Thai university to determine their perception and use of ChatGPT. Findings show that out of 17 students who participated in the survey, only 4 (24%) said they had used ChatGPT tool. Only 2 out of the 17 respondents expressed

positive view of ChatGPT as a tool for learning English language while others were uncertain about the potentials of the use. All the students said they use ChatGPT for academic purpose. Most of the students surveyed—13 out of 17 said they were unaware of the tool. Thus, the author maintains that as at the time of his survey, which was early February 2023, ChatGPT is still new. The reviewed study, however, is different from the present study as the latter only sought students' perceptions regarding ChatGPT, neglecting the educators' perspective. The present study, therefore, sought to close the gap.

Similarly, Bonsu and Baftour-Koduah (2023) examined students' perceptions and intentions regarding using ChatGPT in higher education. Using a mixed-method approach and guided by two hypotheses, the study found no significant relationship between perception and intention to use ChatGPT. In the light of the result, the study indicated positive perceptions among students towards ChatGPT and their intentions to use it, advocating for its adoption in education. This study is, however, different from the present study in that the present study sought to close the gap in knowledge regarding the use of ChatGPT in academic communities.

Furthermore, the result of a pilot study by Zhai (2022) on the efficacy of ChatGPT in writing a research paper reveals that without much expert knowledge on a given subject, the novel chatbot was able to assist researchers to write scholarly research within a short time frame. This again raises concerns about academic integrity in our community as students could use the potentials offered by ChatGPT to plagiarise—use the tool to ace their essays and other academic writing especially those who can afford unbridled access to the digital tool. This concern is also shared in the study of Saliba and Boittsios cited in Adarkwah,et al. (2023) that ChatGPT could be the "death knell" in academic publishing because of its capability to create "cheating and academic fraud" on a large scale. They express concern that this development is worrisome as it could negatively impact scholarship, innovative writing, and intellectual property rights. This study only examined how students could use ChatGPT to generate AI-essays and issues concerning its use. However, the present study sought teachers' sense-making of ChatGPT and its implications on students' assessment.

From the few literature, it is seen that ChatGPT have great potential and it could be a useful tool in ESL pedagogy either at high school or tertiary levels of education. However, a knowledge gap on the part of ESL instructors regarding the use of ChatGPT will make mockery of whatever assessments the teacher may administer to his/her students, as AI-generated essays may not truly reflect the students' ability.

Assessment is a crucial part of teaching/learning processes as it provides a feedback to both the teacher and the learners on what has been taught or learnt. Through different assessment formats, learners' ability is measured and promotion to next grade is done or certificates issued after completion of a prescribed course of study. Assessment is far more than a mere tool for evaluation; it serves as a multifaceted prism through which the dimensions of learning are illuminated, dissected, and understood (Akintade, 2022).

It has been observed that assessment modes in Nigeria education system is rather too examination-oriented and undue emphasis is placed on certification. Most teachers teach to test and usually students' grades do not often reveal their real abilities. As noted by Oche (2015), most teachers use the traditional mode of assessment which is essentially examination-oriented in which learners obtain high grades but may be unable to apply or defend what they have as learnt. In the same vein, Ajayi and Ekundayo (2011) note that the cognitive aspects of learning are continually assessed while the affective side of the learning process receives much less attention in schools in Nigeria. To get a comprehensive feedback on students' achievements, the various assessment techniques should be applied throughout any given educational programme. The

lopsided mode of assessment has some effects. The fear of failure and the desire to pass examination make some Nigerian students engage in different forms of cheating behaviours and examination–malpractices. Examination malpractice is commonly defined as a deliberate wrong doing contrary to official examination rules designed to place a candidate at an unfair advantage or disadvantage (Onyibe, 2015).

The major methods for cheating today include plagiarism. collusion, sharing text spinning (using software to rewrite text), security breaching, and contract cheating (enlisting a third party to do an assessment) (Lancaster, 2022). Digital technology has also been used to cheat (Malley, 2018). Undoubtedly, this calls for concern among education stakeholders. University undergraduates' engagement in cheating behaviour will invalidate any form of information that examiners may want to use to form judgment on their learning outcomes. For instance, English language pedagogy in Nigeria emphasizes communicative competence rather grammatical competence in English language. Therefore, if cheating through the use of ChatGPT is allowed to thrive, it may be difficult to gauge the extent to which university students have learnt what they have been taught in any of the English and the whole teaching-learning process may seem like a mirage. From the foregoing, the present study sought to find out English language educators' sense-making of ChatGPT and its implications the current assessment modes in Nigerian universities.

#### **METHOD**

The descriptive survey research of the survey type was adopted for this study. A total of forty-three (43) university English language educators and five hundred and five (505) pre-service teachers were purposively selected from two higher institutions in Ondo State, Nigeria. Self-structured questionnaire titled: Sense-making of ChatGPT among Language Educators Questionnaire (SCLEQ: r=0.87) and Pre-service Teachers' Sense-making of ChatGPT Questionnaire (PTSCQ: r=0.89) were used for data collection. Both pre-service teachers and language educators responded to the questionnaire. For PTSCQ, the instrument was on a 4 point Likert scale (ranging from 1 – Never used, 2 – Seldom used, 3.0 – Frequently to 4.0 – Always used) while SCLEQ has 4 point Likert scale (ranging from 1- Strongly agreed, 2- agreed, 3: Disagreed and 4–Strongly Disagreed). The data collected were analyzed descriptively.

# **RESULT AND DISCUSSION**

The findings are as summarised in the following table.

**Table 1.** Showing the use of ChatGPT by tertiary institutions students in Ondo State for academic purposes

Descriptive Statistics									
S/N	I use ChatGPT for the following	N	Mean	Std. Deviation	Decision				
1	Academic purposes	506	3.7273	.7889	To a great extent				
2	Assignments & Essays	506	3.6356	2.45891	To a great extent				
3	Research	506	2.8900	3.00000	To a great extent				
4	Learning platform	506	1.0002	1.760000	To a small extent				
	Valid N (listwise)	506							

Table 1 shows the extent to which tertiary institutions in Ondo State use ChatGPT for academic purposes. For the purpose of this study, a mean value of 2.5 is set as a benchmark for decision-making. The study revealed that many students frequently use ChatGPT for academic purposes [M=2.73] and mostly used it for their research and assignments M=3.04). The study further revealed that ChatGPT is effective in helping them complete their assignments and they are currently recommending the use of ChatGPT to their peers and course mates [M=3.07].

Table 2. Showing English language educators sense-making of ChatGPT

Descriptive Statistics								
S/N	Educators sense-making of ChatGPT	N	Mean	Std. Deviation	Decision			
1	I am aware that ChatGPT could be integrated into ESL instructions	43	1.0000	.00000	Disagree			
2	I am familiar with the features and capabilities of ChatGPT	43	1.5000	.58029	Disagree			
3	I actively encourage my students to use ChatGPT as a learning tool	43	1.9200	.94415	Disagree			
4	I have received training on how to integrate ChatGPT into my teachings	43	2.0800	.122624	Disagree			
5	I actively seek to improve my own understanding of ChatGPT and its educational application	43	1.9000	.12949	Disagree			
	Valid N (listwise)	43						

Table 2 displays English language educators sense-making of ChatGPT. The result revealed that English language educators in tertiary institutions in do not to integrate ChatGPT into their instructions [M=1.00] which may not be unconnected to the fact that they [language educators| may not be familiar with the features and capabilities of ChatGPT [M=1.50]. The result also revealed that English language educators do not encourage their students to use ChatGPT as a learning tool probably because they have not received training on how to integrate ChatGPT into their teachings and neither are they doing anything to improve their understanding of it and its educational application.

Findings from RQ 1 revealed that Nigerian tertiary institutions have great knowledge of ChatGPT and therefore, they are actively using it to ace their essays and assignments. However, RQ 2 indicated that English language educators neither engage ChatGPT nor integrate it into their teaching pedagogy. These findings showed that English language educators simply do not know the extent to which their students are using ChatGPT to deliver their assignments and essays, which suggests there is no equilibrium regarding the use of ChatGPT between the students and the educators. For that reason, the current assessment mode in Nigerian tertiary institutions may be hastily becoming obsolete given that the major tools of assessments in Nigerian institutions, assignments and essays, can be easily generated with ChatGPT. And if students continue to submit ChatGPT-generated assignments and essays as theirs, assessments may not reveal true students' ability and learning progress. And when assessment fails to reveal what it purports to measure, such assessments are challenged and need re-evaluation and reconsideration. Therefore, with the

proliferation of ChatGPT among Nigerian students, essays and assignments may not suffice, as students would do anything to pass, including submitting AI-generated essays.

# **DISCUSSION OF FINDINGS**

Results on students' use of ChatGPT revealed that a significant number of Nigerian students use ChatGPT to a very great extent. This may not be unconnected with the ease at which ChatGPT generate responses to students' academic queries. The result of this study correlates the findings of Adigun, Ajani and Aboyade (2023) who found out in their studies that students primarily leverage ChatGPT for academic purposes. Similarly, the result of this study confirms the study of Adefuye, Omoyajowo, Oputa, Omojola and Olusanjo (2023) who found out that there was a positive attitude towards the use of ChatGPT among postgraduate student in University of Ibadan. This results proved once again that Nigerian students – from undergraduate level to postgraduate level are using ChatGPT for academic purposes. In the study of Nnaemeka and Ogunbadejo (2024), their study indicated a high level of awareness and knowledge with clear understanding of Chat-GPT's functionalities and they confirmed its proliferation and utilization of for academic purposes and research tasks. While Nigerian students' exposure to AI tool such as ChatGPT, what is of serious concern is ethical use of the tool. While chatGPT could assist students, clear stipulated ways to use it should be made known to the students. As observed, ChatGPT is the new tool for academic dishonesty and this is a threat to the current mode of assessments in Nigeria.

Research Question Two revealed that English language educators in tertiary institutions in Nigeria do not engage ChatGPT and this may not be unconnected with lack of sense-making regarding its features and capabilities. This result corroborates the findings of Ukeh and Anih whose studies indicated a relatively low adoption of AI tools among Federal University Otuoke lecturers for teaching and research. In the same vein, the findings of this study confirms that of Kangiwa and Abubakar (2024) whose studies indicated that that ChatGPT is not extensively utilized by academic staff at the Federal College of Education(Technical) Bichi. However, the findings of Madu and Musa (2023); Gaber, Shahat, Alkhateeb, Al Hasan, Alqatam, Almughyirah, and Kamel (2023) indicated moderate level of awareness of lecturers on AI. The results, however, did not specified if AI tools such as ChatGPT were integrated into their classroom pedagogy.

## **CONCLUSION**

This study investigated the sense-making of ChatGPT among English language educators in Ondo State, Nigeria. The result indicated a prevalence of use of ChatGPT among Nigerian university students. However, there is a glaring lack of sense-making of ChatGPT among English language educators in Nigeria as they do not engage in it nor do they integrate it into their teaching. This study therefore foregrounded the fact that Nigerian students are outpacing their educators already as they are actively using ChatGPT to generate essays and assignments. If this behavior is allowed to thrive, the academic integrity of the nation becomes questionable and the assessment mode threatened. To make the best out of AI, English language educators and their students have to be the same page as regarding the use and functionalities of ChatGPT. On the basis of the findings of this study, some recommendations were made:

- 1. Nigerian universities should organize exclusive training on the use of AI tools such as ChatGPT to the academic staff and the students alike. By so doing, Teachers and students would be on the same page regarding the ethical use of AI tools.
- 2. Given the prevalent use of ChatGPT among students, it is expedient that assessment modes in Nigeria be redesigned and re-evaluated.

- 3. English educators in Nigeria should be taught how to detect AI generated essays through the syntactic and grammatical jugglery
- 4. As observed, some undergraduate students do not know that copying from AI verbatim is an academic dishonesty, therefore, they ignorantly do this. Training and workshop on how to use AI generated contents should be conducted.

English educators in Nigerian universities should be enlightened on how to integrate AI tools such as ChatGPT into their teaching pedagogy.

# **REFERENCES**

- Adarkwah, M. A., Wyk, A., Tlili, R., Shehata, B., Metwally, H., & Wang, A. (2023). Awareness and acceptance of ChatGPT as a generative conversational AI for transforming education by Ghanaian academics: A two-phase study. Journal of Applied Learning & Teaching, 6(2). http://journals.sfu.ca/jalt/index.php/jalt/index
- Adefuye, Omoyajowo, Oputa, Omojola, & Olusanjo. (2023). Postgraduates' attitude and perception towards the use of ChatGPT for research: A case study of postgraduate students of the University of Ibadan. Journal of Human, Social & Political Science Research, 29(6). https://www.cambridgenigeriapub.com/wp-content/uploads/2023/10/SJHSPR\_VOL.28.\_NO.6-12.pdf
- Adigun, G. O., Ajani, Y. A., & Aboyade, M. A. (2023). Undergraduate students' perspectives in optimising chatbot for reference services in Nigerian higher institutions: A comparative analysis of ChatGPT and conventional reference assistance. Journal of Library, Science Education and Learning Technology (JOLSELT), 4(1), 27–39. https://alhikmahuniversity.edu.ng/centralJournal/my\_portal/user/event/bookUrl732.pd f
- Ajayi, A., & Ekundayo, H. (2011). Factors determining the effectiveness of secondary schools in Nigeria. Anthropologist, 13(1), 33–38. Retrieved from http://krepublishers.com/02-Journals/T-Anth/Anth-13-0-000-11-Web/Anth-13-1-000-11-Abst-Pdf/Anth-13-1-033-11-630-Ekundayo%20H-T/Anth-13-1-033-11-630-Ekundayo%20H-T-Tt.pdf
- Alejandro, G., Giovanna, J., Javier, P., Haydeé, Q., Marco, A., Guillermo, Y., Hugo, R., Rosa, M., Herbert, V., & José, L. (2023). Effect of ChatGPT on the digitized learning process of university students. Journal of Namibian Studies, 33(S1), 1–15. https://doi.org/10.371705129
- Bonsul, E., & Baffour-Koduah, D. (2023). From the consumers' side: Determining students' perception and intention to use ChatGPT in Ghanaian higher education. Journal of Education, Society and Multiculturalism. Retrieved from https://www.researchgate.net/publication/369243024\_From\_the\_Consumers'\_Side\_Determining\_Students'\_Perception\_and\_Intention\_to\_Use\_ChatGPT\_in\_Ghanaian\_Higher\_Education
- Gaber, S. A., Shahat, H. A., Alkhateeb, I. A., Al Hasan, S. A., Alqatam, M. A., Almughyirah, S. M., & Kamel, M. K. (2023). Faculty members' awareness of artificial intelligence and its relationship to technology acceptance and digital competencies at King Faisal University. International Journal of Learning, Teaching and Educational Research, 22(7), 473–496. https://doi.org/10.26803/ijlter.22.7.22
- García-Peñalvo, F. J. (2023). The perception of artificial intelligence in educational contexts after the launch of ChatGPT: Disruption or panic? GRIAL Repository. https://doi.repositorio.grial.eu/handle/grial/2838

- Kangiwa, S., & Abubakar F., (2024). Awareness and utilization of ChatGPT among academic staff of Federal College of Education, Bida. International Journal of Educational Research and Library Science, 4(8). https://doi.org/10.3026/8478
- Lankaster, T., & Clarke, R. (2016). Contract cheating: The outsourcing of assessed student work. Handbook of Academic Integrity, 639–654. https://doi.org/10.1007/978-981-287-098-8\_17
- Liu, B. L., Morales, D., Roser Chinchilla, J. F., Sabzalieva, E., Valentini, A., Vieira do Nascimento, D., & Yerovi, C. (2023). Harnessing the era of artificial intelligence in higher education: A primer for higher education stakeholders. Caracas: IESALC. https://unesdoc.unesco.org/in/rest/annotationSVC/DownloadWatermarkedAttachment/attach\_import\_27bc9723-2025-4581-b0cc-ea53b09a271e?\_=386670eng.pdf&to=93&from=1
- Madu, C., & Musa, A. (2023). Lecturers' level of awareness of artificial intelligence as correlate of their digital competence at Federal University Wukari, Nigeria. Journal of Educational Research in Developing Areas (JEREDA), 5(1), 59–61. https://doi.org/10.379081280
- Malley, B. (2018). The digital revolution in cheating has already begun. The Global Window on Higher Education, Global News Education, (513). https://www.chea.org/sites/default/files/2018-07/The-Digital-Revolution-in-Cheating-Has-Already-Begun.pdf
- Namvar, M., Cybulski, J., Phang, C., Seng Ee, Y., & Liang Tan, K. (2018). Simplifying sensemaking: Concept, process, strengths, shortcomings and ways forward for information systems in contemporary business environments. Australasian Journal of Information Systems, 22. Retrieved from https://www.researchgate.net/publication/322659905\_Simplifying\_Sensemaking\_Conce pt\_Process\_Strengths\_Shortcomings\_and\_Ways\_Forward\_for\_Information\_Systems\_in\_Con temporary\_Business\_Environments
- Nnaemeke, F., & Ogunbadejo, I. (2024). Awareness, knowledge, and perception of Chat-GPT among undergraduates of Nnamdi Azikiwe University, Awka, Anambra State, Nigeria. International Journal of Research and Scientific Innovation, 11(3). https://doi.org/10.51244/IJRSI.2024.1103013
- Oche, E. S. (2014). Issues in the assessment of effective classroom learning in Nigeria. Journal of Humanities and Social Science, 19(10). Retrieved from https://www.iosrjournals.org/iosr-jhss/papers/Vol19-issue10/Version-3/E0191032529.pdf
- Onyibe, U. (2015). Exam malpractice and national development. International Journal of Education, 16(6). Retrieved from https://www.academia.edu/123456789
- OpenAI. (2023). Introducing ChatGPT. OpenAI. Retrieved from https://openai.com/blog/chatgpt
- Thadphoonton, J. (2023). ChatGPT: A viable tool for English language learning and teaching? ResearchGate. Retrieved from https://www.researchgate.net/publication/371874152\_ChatGPT\_A\_Viable\_Tool\_for\_English\_Language\_Learning\_and\_Teaching
- Tlili, A., Shehata, B., Adarkwah, M. A., Bozkurt, A., Hickey, D. T., Huang, R., & Agyemang, B. (2023). What if the devil is my guardian angel: ChatGPT as a case study of using chatbots in education? Smart Learning Environments, 10(1), 15. https://doi.org/10.1186/s40561-023-00226-1

- Tontus, O. (2020). Concept of assessment and evaluation. In Glossary of assessment in higher education. ResearchGate. Retrieved from https://www.researchgate.net/publication/344750546\_Concept\_of\_Assessment\_and\_Evaluation/link/5f8d9d56299bf1b53e32757c/download
- Ukeh, B., & Anih, A. (2024). Utilization of artificial intelligence-based tools for teaching and research among lecturers in Federal University Otuoke, Bayelsa State, Nigeria. Sapientia Foundation Journal of Education, Sciences and Gender Studies (SFJESGS), 6(1). https://www.sfjesgs.com/index.php/SFJESGS/article/download/508/508
- Zhai, X. (2023). ChatGPT and AI: The game changer for education. AI4STEM Education Center, University of Georgia. Retrieved from https://www.alejandrobarros.com/wp-content/uploads/2023/06/SSRN-id4389098.pdf