

International Journal of Learning, Teaching and Educational Research
Vol. 25, No. 1, pp. 779-803, January 2026
<https://doi.org/10.26803/ijlter.25.1.36>
Received Jul 30, 2025; Revised Oct 1, 2025; Accepted Jan 9, 2025

Enhancing Academic Outcomes of Year 3 English Education Lexicology Students in the University of Calabar, Cross River State, Nigeria using ChatGPT AI: A Quasi-Experimental Study

Gladys Denis Ukume 
University of Calabar
Cross River State, Nigeria

Kirian James Jacob 
University of Uyo
Akwa Ibom State, Nigeria

Vincent Ugah Uguma  , **Affiong Sunday Okoh** 
University of Calabar
Cross River State, Nigeria

Peace Oja Egbai 
University of Cross River State, Nigeria

Francis Fabian Akpa-Inyang* 
Durban University of Technology, Durban, South Africa

Abstract. This study was carried out to examine the effect of ChatGPT AI and academic outcomes of year 3 English Education students at the University of Calabar, Nigeria in Lexicology. Three research questions and three hypotheses were developed to accomplish this goal. The study used a quasi-experimental non-randomized pre-test and post-test control group design. The population consisted of 325 English Education students in the Department of Arts Education, Faculty of Education, for the 2024/2025 academic session. The Purposive sampling technique was used to select a sample of 295 respondents, 148 of whom were in the experimental group and 147 in the control group. The Lexicology Performance Test (LPT) was developed and utilized to gather data. The Split-Half Method produced a reliability coefficient of 0.76. The study employed Mean and Standard Deviation to address the research

*Corresponding author: Dr. Francis Fabian Akpa-Inyang; francisakpainyang@gmail.com

questions and Analysis of Covariance (ANCOVA) to test the hypotheses at 0.05 levels of significance with F-value of 3.84. The findings indicated that ChatGPT significantly improved students' academic performance, retention and cognitive capacity in Lexicology. The study's findings therefore showed the potential of the application of ChatGPT in boosting learning outcomes in Lexicology. The study conclusively demonstrated that integrating ChatGPT AI into Lexicology instruction significantly enhanced the academic performance, retention, and cognitive abilities of year 3 English Education students. It was recommended that universities should encourage academic staff training on the use of 21st century technology strategies such as ChatGPT to improve students learning outcomes.

Keywords: ChatGPT AI; Lexicology; Academic Performance; English Education Students; Cognitive abilities; retention rates; University of Calabar; Nigeria

1. Introduction

Lexicology learning is a critical aspect of language learning. In basic communication, Lexicology helps students to identify and learn the basic language skills in English Language necessary for self-development. Lexicology makes students acquire appropriate word usage, meaning, structure and functions which play important roles in remodeling students' writing skills as well as general language development. The study of Lexicology is particularly relevant to global world where English Language continually evolves due to social, cultural, institutional and technological influence (Shahina & Nuriddinova, 2025). As relevant as the study of Lexicology is, students often struggle with assimilating and exercising their proficiency in the use of lexical words such as semantic, idioms and idiomatic expressions with other contextual vocabulary usage.

This challenge even affects correct interpretation of lexical data and hinders their ability to flow in the use of English Language. The use of interactive learning assistance coupled with linguistic texts is likely to improve students' interest in studying Lexicology that could consequently enhance their academic outcomes. This can also reduce difficulty and withdrawal from studying Lexicology in tertiary institutions. Results-oriented learning requires adequate encouragement for students to stay on course.

Using appropriate innovative teaching strategies and resources could be derived from technologically aided learning tools such as ChatGPT which is an AI aided tool. ChatGPT has not only created a storm in the media and public interest by going online, but it has also sparked significant interest in academics in the teaching of Lexicology (Mathew, 2023). ChatGPT is a GPT technology extension that is used to generate dialogue with the user (Lund & Wang, 2023). ChatGPT can also support and leverage students learning of Lexicology through its Natural Language Processing (Nga & Dang, 2024).

The academic environment of a university is supported by five main pillars: “the faculty, students, physical facilities, curriculum and instructional materials”. To improve the educational process, all these components are required. However, curriculum design is particularly important for promoting inclusion, learning outcomes, employability, skills and students’ engagement. The delivery of the curriculum in Lexicology is greatly influenced and affected by the teaching and learning methods used by specific institutions. It is therefore crucial to develop an inclusive curriculum using ChatGPT in which important stakeholders can play active roles. The incorporation of technology such as ChatGPT to enhance learning makes it exciting and critical in today’s technological advancement in the global space.

The degree to which educational institutions and students meet their short- or long-term learning goals is largely determined by the academic achievement of the students (Uguma & Timothy, 2023). To gauge this performance, performance tests, continuous evaluation and the Cumulative Grade Point Average (CGPA) are commonly used. Performance evaluations and semester examinations are frequently used in higher education to gauge students' academic progress. In the Department of Language Arts, Faculty of Arts and Social Science Education and the English and Literary Studies Department where English Language is being taught within the university. Lexicology happens to be one of the major courses that focus on English language vocabularies and their definitions. As a result, proficiency in vocabulary and grammar is crucial to determining academic performance and other learning outcomes in English Language Lexicology (Abubakar, 2021).

Etymologies, proverbs, clichés, word structure, and idioms are just a few of the many components that make the English language so complicated. Lexicology is a type of linguistics that has interrelated parts (Tetiana, 2022). As Abubakar (2021) points out, lexical instruction is the foundation of successful language training in higher education. It is also thought that a language's structure is determined by the arrangement of words to form phrases, clauses and sentences. Learning vocabulary and Lexicology is essential for students to effectively comprehend other subjects and courses.

Some language educators have argued that the use of digital technologies and media resources is necessary for teaching and learning English as a second language at various educational levels. Ukume, Edu and Uguma (2025) proved in a study that the use of animation videos and interactive whiteboards improved pupils’ performance in vocabulary knowledge. Ukume and Uguma (2024) again established that using power point presentation (multi-media) technology improved students’ performance in summary writing. Effective Lexicology instructions may be provided in universities using ChatGPT and other AI-powered resources.

ChatGPT in the classroom has the potential to enhance Lexicology instruction and learning in higher education (Holmes et al., 2019). ChatGPT means a generative artificial intelligence capable of producing a text like human beings, produce class

lesson plans, makes instructional notes, translates languages as well as creates well-structured lessons in any subject, including English Language. Olumide (2024) posits that ChatGPT has a powerful linguistic fluency and versatility in English Language capable of carrying out numerous tasks including summarising documents like Lexicology lessons notes, providing replies across several disciplines to students. ChatGPT can even pen articles on diverse subjects (Ray, 2023). Furthermore, ChatGPT has been widely used in educational settings to enhance learning experiences and support personalised instruction (Olumide, 2024).

ChatGPT's ability to generate coherent and contextually relevant responses makes it a valuable tool for students seeking academic assistance. ChatGPT (AI) could provide standard technology-based features that could facilitate interactive instructional communication, leveraging on virtual assistants to simulate students' interaction during lexicology lesson (Inmaculada et al., 2023). Olumide (2024) asserts that ChatGPT could become a useful chatbot relevant for students studying Language Arts who could visit the libraries frequently and provide insightful instruction in lexicology lessons. ChatGPT could aid students with cognitive skills, problem solving skills and retention abilities. ChatGPT usually adopts computer language to boost the educational process, all these components are required.

However, curriculum format is especially important for promoting inclusion, getting to know outcomes, employability, abilities and college students' engagement. The shipping of the curriculum in Lexicology is significantly prompted and stricken by the teaching and mastering strategies utilized by institutions. It is miles therefore necessary to expand an inclusive curriculum the usage of ChatGPT wherein important stakeholders can play energetic roles. The incorporation of generation inclusive of ChatGPT to decorate gaining knowledge of makes it thrilling and vital in today's technological advancement inside the international space.

The diploma to which educational establishments and students meet their brief- or long-term mastering goals is largely determined with the aid of the academic fulfillment of the students (Uguma & Timothy, 2023). To gauge this overall performance, overall performance assessments, non-stop assessment and the Cumulative Grade point average (CGPA) are usually used. performance evaluations and semester examinations are frequently used in better education to gauge college students' academic progress. within the department of Language Arts, school of Arts and Social technology education and the English and Literary research branch wherein English Language is being taught inside the university. Lexicology takes place to be one of the essential courses that concentrate on English language vocabularies and their definitions. As a result, talent in vocabulary and grammar is fundamental to figuring out academic overall performance and other studying consequences in English Language Lexicology (Abubakar, 2021).

Etymologies, proverbs, clichés, phrase shape, and idioms are only some of the various additives that make the English language so complicated. Lexicology is a form of linguistics that has interrelated components (Tetiana, 2022). As Abubakar (2021) points out, lexical guidance is the foundation of a success language schooling in better training. It is also idea that a language's form is determined by the arrangement of words to structure terms, clauses and sentences. Getting to know vocabulary and Lexicology is quintessential for college kids to successfully recognise different subjects and courses.

Some language educators have argued that using virtual technologies and media sources is integral for teaching and gaining knowledge of English as a 2nd language at numerous instructional stages. Ukume, Edu and Uguma (2025) proved in a look at that using animation videos and interactive white board stepped forward scholars' overall performance in vocabulary information. Ukume and Uguma (2024) once more established that the usage of power point presentation (multi-media) generation improved college students' performance in summary writing. Effective Lexicology instructions may be provided in universities using ChatGPT and other AI-powered assets.

ChatGPT within the classroom has the capacity to decorate Lexicology guidance and gain knowledge in higher training (Holmes et al., 2019). ChatGPT skill a generative artificial talent able to produce a text like people, produce magnificence lesson plans, makes educational notes, translates languages as well as creates nicely based classes in any subject, which include English Language. Olumide (2024) posits that ChatGPT has a powerful linguistic fluency and versatility in English Language able to wear out numerous responsibilities together with summarising files like Lexicology classes notes, presenting replies across several disciplines to college students. ChatGPT can even pen articles on numerous subjects (Ray, 2023). Furthermore, ChatGPT has been broadly utilized in academic settings to beautify studying studies and guide personalized training (Olumide, 2024).

ChatGPT's capability to generate coherent and contextually relevant responses makes it a treasured device for college students seeking educational assistance. ChatGPT (AI) could offer general era-primarily based features that could facilitate interactive educational verbal exchange, leveraging virtual assistants to simulate students' interplay all through lexicology lessons (Inmaculada et al., 2023). Olumide (2024) asserts that ChatGPT may want to become a beneficial chatbot relevant for college students studying Language Arts who may want to go to the libraries frequently and offer insightful instruction in lexicology classes. ChatGPT should resource college students with cognitive competencies, problem solving capabilities and retention capabilities. These potentials of ChatGPT generation commonly adopt laptop language to boost students' reasoning skills. ChatGPT enables Language Arts students to learn in a conducive surroundings. ChatGPT helps Language Arts students to learn in a conducive environment.

Inmaculada et al (2023) posit that teaching Lexicology lessons with ChatGPT AI could help university undergraduates to improve academically in English language. This does not replace the real conventional presence of lecturers. The United Nations Educational Scientific and Cultural Organization (UNESCO, 2019), discusses that positive result of lexicology learning using artificial intelligence including ChatGPT as characterized by three important divisions: (1) learning with AI, which is application of AI in the classroom; (2) learning about AI, which entails understudying the strategies, technologies and techniques embedded in AI; and (3) preparing for AI, which is getting ready for the innovation, changes and prospects of using AI in modern and transforming world of pedagogy. ChatGPT could influence students' potency in debates, giving students access to wide range of knowledge on Lexicological objectives, and proffering precise remedies to difficulty in advanced information analysis, synthesis, knowledge and application (Ezurike & Akisulire, 2024).

Furthermore, AI skills could be used to design and develop lexicology contents for university students with the AI techniques. In recent time, ChatGPT and other AI tools have brought significant reformation in language learning by helping students gain access to instructional resources in English language skills. AI-driven accessories that could improve language learning with efficient outcomes include chatbots like ChatGPT, virtual tutors, language learning applications and speech detection software. Natural Language Processing (NLP) and powerful algorithms made reality of these AI technologies that allow for synchronous language experiment, interactive learning, and self-paced feedback mechanism. Speech recognition software is the most influential AI-driven language learning application available for university education (Alia Sa'ad, Abdelhadi, Omar & Basim, 2023).

Speech recognition software gives English Language students' immediate feedback on their pronunciation, intonation and fluency while precisely transcribing and analyzing their voice, allowing them to practice spoken language. Students can learn speaking skills independently and successfully through recommendations on objectives of instruction and language development using ChatGPT for university grammar contents. Alia Sa'ad et al. (2023) explain that chatbots including ChatGPT have become increasingly popular as interactive Lexicology learning aids. Moreover, AI- powered tools like ChatGPT have immensely contributed to education development through integrating concepts of Lexicology with instructional methods, techniques and strategies to affect the way students learn, interact with the lesson as well as improve their learning outcomes.

Artificial intelligence (AI) solutions like ChatGPT have brought vogue and cue inventions using advance library resources to revolutionalise education. With its ability to maximize resources, provide individual support and intervene early, ChatGPT AI helps improve students' retention in courses like Lexicology. Students' forgetfulness and associated failure to transfer knowledge is a major problem with traditional teaching methods. Abdellatif, Al Mushaiqri, Albalushi, Al-Zaabi, Roychoudhury, and Das (2022) explain that AI-enhanced techniques

such as ChatGPT can boost persuasion. By promptly responding to questions regarding course registration, assignment submission, class schedules, lesson materials, and deadline reminders. ChatGPT and other artificial intelligence (AI) technologies can significantly improve academic performance. Personalized learning, learning efficiency and attaining high levels of information retention have all been studied in AI technologies through spaced repetition (Lingfei, Xi, & Yan, 2025).

Students' lexicological retention may be significantly impacted by ChatGPT. Karahan (2024) asserts that the advent of artificial intelligence, such ChatGPT AI, in the classroom has revolutionised the way knowledge is transmitted and preserved by opening new avenues for Lexicology education and learning. Abigail, Kirian Victoria, and Edidiong (2024) claim that the advent of ChatGPT and other AI resources has made artificial intelligence easier to assess students' retention during the teaching process. Majority of Nigerian students who use AI and GAI have positive effects on academic performance and retention (Ngonso, Ukhurebor, and Nduehi, 2025). Additionally, they are synonymous with Snapchat AI and ChatGPT. Ezeaghasi and Obochi (2025) claim that ChatGPT can be used in Lexicology to make complex and theoretical ideas easier to understand, provide creative interpretations and enhance the visual appeal of lexicology resources and digital content.

Students' cognitive abilities could be improved when Lexicology lessons are taught using AI tools like ChatGPT. According to Jalon, Chua, and Torres (2024), ChatGPT can create and modify information, text, figures and tasks quickly and can adapt instructional materials to learners' cognitive ability. Silva et al. (2024) posits that giving students precise instructions on how to use ChatGPT can help them develop their critical-thinking and problem-solving abilities while they are studying programming. Conversely, ChatGPT and other AI-powered chatbots have long been used extensively in educational domains like Language Education to teach Computer Science and Lexicology (Zhang et al., 2023). They are employed in research support, automated instructional management, knowledge acquisition, cognitive skills and classroom engagement.

According to Ade-jibola and Okonkwo (2023) this advantage means that students can now complete lexicology-related learning tasks without the actual presence of lecturers, thanks to AI functionality. Krzyszt and Lena (2022) state that academic achievement; task simplification, personalization, and freeing up lecturers to concentrate on cultivating distinctive human qualities are some of the possible effects of AI like ChatGPT on cognitive capacities. Learning Lexicology is improved by utilizing the many benefits of AI in terms of requests, trends and delivery instruction. Therefore, this study used the capabilities of the modern ChatGPT AI language model to improve the academic performance of third-year English Education students in the field of Lexicology across cognitive skills and retention.

1.1 Statement of the Problem

Lexicology as part of English language teaching and learning plays critical role in semantic, idioms and idiomatic expression which are central in basic language communication skills and contextual vocabulary usage. Some students learn English as second Language (ELS), particularly in the University of Calabar often finds it difficult to express correct interpretation lexical items both oral and written text. Many English Education students from the study area often complain of the difficulty and the abstract nature of learning Lexicology. This has often had negative effects on their academic performance and cognitive ability even in other causes of study. The researchers observe that these challenges could be blamed pedagogical issues. Some lecturers socially depend on textbooks knowledge and expository methods in teaching Lexicology. This traditional method often does not help students to boost their interest in Lexicology. This lecturer-centered rather makes it difficult for students to comprehend and interact with the lexicological content.

Considering the fact that in some tertiary institutions students are already exposed to the use of digital tools in their studies like Google Classroom, Zoom, WhatsApp, Telegram and even Artificial Intelligence (AI) to do their assignments, there is need to expose students to AI powered tools like EduGPT, AI Teacha, Snapchat, Meta AI, Chat on AI and of more recent the ChatGPT. Using ChatGPT in teaching Lexicology could help arouse students' attention and interest. This is based on the functions of ChatGPT which can be used to design and develop lexicology content.

ChatGPT can be used to allow students synchronise language experiments, interactive learning and self-paced feedback mechanism. Another challenge faced in lexicology learning is their inability to retain and utilize information which in turn has negative effects on their general academic performance. It is on these notes that the researchers carried out the study to examine academic outcomes of Year 3 English Education Lexicology students in the University of Calabar, Cross River State, Nigeria using ChatGPT AI.

1.2 Purpose of the Study

The main purpose of this study was to find out how modern ChatGPT technology affects the Lexicology academic performance of year 3 English Education students. In particular, the research sought to:

1. examine the differences in the academic performance scores of students taught using ChatGPT and those taught using the conventional expository technique Lexicology.
2. ascertain the difference in retention rates of taught Lexicology taught using ChatGPT.
3. examine the difference in the academic performance of students in Lexicology taught using ChatGPT, based on their cognitive ability levels.

1.3 Research Questions

The following research questions guided the study:

1. What is the difference in the academic performance scores of students taught using ChatGPT and those taught using the conventional expository technique in Lexicology?
2. What is the effect of ChatGPT on students' retention rates in Lexicology?
3. What is the effect of ChatGPT on students' cognitive ability levels in Lexicology?

1.4 Research Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance:

1. There is no statistically significant difference in the academic performance scores of students taught using ChatGPT and those taught using the conventional expository technique in Lexicology.
2. There is no statistically significant effect of ChatGPT on students' retention rates in Lexicology.
3. There is no statistically significant effect of ChatGPT on students' cognitive ability levels in Lexicology.

1.5 Significance of the Study

The results of this study using modern ChatGPT could help the following education stakeholders, lecturers, students and curriculum designers. The study has implications for:

1. English Education lecturers and other English-teaching departments could offer recommendations on design principles through adding ChatGPT in students' lessons.
2. ChatGPT could lighten students with functions in contemporary education and guide their word choice and meaning in lexicology.
3. This study could help English curriculum designers whose goal is to harness the potentials of ChatGPT to enhance student learning outcomes and also promote innovation teaching strategies in Language arts and where use of English will be taken as an eclectic subject.

2. Literature Review

2.1 The Concept of ChatGPT AI and Utilization

Stanford Education (2024) explains that ChatGPT AI refers to a text-generated expository language model that could create human-like responses through conversational assistance, suggestions and remedial questions to students. Unlike traditional learning, this innovative tool enables users to perform more focused and engaging resource searches and provides a personalized and tailored experience based on each user's needs (Hwang et al. 2020). Students and lecturers can enhance their proficiency and experience in speaking and writing in English by using ChatGPT (Okan & Hidir, 2024). ChatGPT can provide instant feedback, smart and individualized learning experiences, to support pedagogy regardless of time or contextual tasks (Okan & Hidir, 2024).

Chatbots such as ChatGPT, Woebot, Kuki and Replika, play significant roles in the domains of education such science, computer science research and language instruction (Belda-medina & Calvo-Ferrer, 2022; Zhang et al., 2023). Hwang and Chang (2023) carried out a study to investigate the current trends in the use of ChatGPT and other AI chatbots in education and science. The study unveiled the substantial deficit in research on K-12 education, with most studies focusing on language instruction. However, Hwang and Chang (2023) pointed out that the studies did not highlight specific learning tactics to be adopted by schools; they frequently used a “teacher supported learning” strategy that learn with chatbots while being watched over by a teacher.

Standford Education (2024) asserts that ChatGPT AI helps lecturers create and develop content by using a variety of abilities, such as: 1. The skill sandbox: this exposes students to practice, facilitating class debates, facilitating lectures with students, and determining their levels of lexicological proficiency. 2. Communication Key: it links the students to important terms, which can give them instant access to course information. 3. Flashcard and Memorization Activities: this uses interesting exercises to enhance students' learning and 4. Questioning and Feedback: these function by challenging students to ask questions, react with explanations and receive anonymous feedback.

However, as ChatGPT is gaining effectiveness in Language Arts and beyond, its effects on error in writing in ESL contexts have not still been investigated. Chatbot such as ChatGPT has demonstrated hope in improving writing skills in English-speaking and proficiency as Second Language order (ESL) by offering targeted corrections and personalized feedback, thereby enhancing advantage in spoken and writing composition effectively. Jamshed, Ahmed, Sarfaraj and Warda (2024) in their study adopted an experimental research design to evaluate how effective ChatGPT's could affect mobile technology effectiveness on conventional teacher proficiency in secondary schools in India. The teachers supported the students in the control group during the two months of the study, meanwhile the experimental group received instruction on their writing error using ChatGPT technology.

Furthermore, a questionnaire was provided to 132 students after the experiment to test the students' opinion on the effectiveness of ChatGPT for language learning. Students' data were obtained using pre-and post-tests that required creation tales based on images in line with the content of the instruction. During the experiment, it was observed that the writing skills of the experimental group outclassed the control group and simple mistakes were minimal. Additionally, most students favoured supported AI adoption and connected it to observable gains in their grammatical and writing abilities. The result of the findings owes credence on adoption of AI technology including ChatGPT into language learning programs as useful remedy to conventional teaching method, which provided instantaneous and clear-cut corrections that enhanced students' performance.

Ho (2024) observes that ChatGPT's can serve as a temporary substitute to teachers in Lexicology class provided the teacher has carefully developed and designed

the lesson. Vazquez Cano et al (2021) carried out a study to investigate the behaviour of students', perception, and feeling about using ChatGPT in English Language instruction. The sample consisted of 120 English-speaking IT students enrolled in non-specialized courses at the University of Da Nang in Vietnam and the Korea University of Information and Communication Technology.

In-depth interviews and a multiple-choice questionnaire with a 4-point Likert scale were used to gather data. Although the study acknowledged the usefulness of ChatGPT for ESP vocabulary acquisition, translation, grammar checking, and paraphrasing, the results highlighted the need for instruction in real classroom situations. Students primarily used ChatGPT to get quick fixes for their English language learning issues. The study highlights the importance of teaching students how to use ChatGPT correctly and the need for further research into plagiarism detection software to prevent potential misuse of the platform. The result of the finding showed that the experimental group outperformed those in the control group academically after learning punctuation from a chatbot.

2.2 ChatGPT AI and Students' Retention

Students' retention involves the ability of the students to store and retrieve lexical concepts after every class. It is the tendency to sustain lexical information in the memory and reproduce when needed at the right time. Teachers' careful design of lexicology instruction can make students remember or utilise the experience over a long period. Retention brings realistic learning beyond forgetting (Uguma & Ukume, 2019). When what was learnt in lexicology could be reproduced in tests, assignments and examinations with optimum performance, then, the lesson in lexicology has yielded positive result. For the lesson in lexicology to show high retention after being taught, a student should be able to recall the experience, knowledge, skills or things earlier discussed by lexicology instructor. According to Lasha et al. (2023), ChatGPT can have a major effect on students' performance and learning, as well as their ability to reason explicitly and retain information in Lexicology.

ChatGPT is a strong tool to students' retention of lexicology lesson depending on the teachers' ability to inculcate skills and knowledge to the lesson plan. Teachers must exhibit the trait of professionalism and consciousness in manipulating the lesson to enhance learning outcome. Teachers must also possess basics, modern innovative and knowledge of lexicology content before using ChatGPT to avoid negative indoctrination. Teachers should be discipline when evaluating students' tasks to control ethical use of ChatGPT. This is because ChatGPT has limited advantage in academic setting. Ade-Jibola and Okonkwo (2023) note that while ChatGPT influence various learning-related aspects; it does not significantly affect students' learning outcomes. This shows that effective pedagogy needs students' concentration to realize learning outcomes. In a similar manner, the adoption of ChatGPT AI into English Language such as Lexicology has produced numerous advantages, including:

Instant lecturers' assistants

- a) Prompt information accessibility
- b) Desired academic performance

- c) Improved retention and
- d) Promote efficient learning experiences (Lasha et al., 2023)

ChatGPT has gained a global recognition due to its deep inclusion into English grammar teaching, students' adequate response and feedback mechanism. However, the way and manner students understand how to use this AI writing tools in their academic task is equally important to their academic development. Shittu, Busari and Olonade (2025) conducted a study on the knowledge, attitude and perception of students regarding the use of ChatGPT at the University of Ibadan, Nigeria. The study adopted a mixed method research design. The study was anchored on social constructivism theory.

The result of the findings showed that students are highly aware of ChatGPT through recommendations by peer and school mates. The IBM-SPSS Version 23 was used to analyse the data on Independence Sample T-test and descriptive statistics. Thematic and content analysis were performed on the qualitative data. Despite students' high awareness of ChatGPT, the study found that several academics claimed not to be familiar with it. The study suggested that seminars should be conducted for teachers and students on the use of technology; particularly AI powered learning, to be incorporated into the curriculum to create awareness.

Whilst ChatGPT serves as a valuable tool, lecturers are still essential to guide students in their course of study. Kasneci et al., (2023) noted a significant gap in students' effective utilization of ChatGPT in the learning process including Lexicology. Although, students find ChatGPT helpful in completing studies and assignments, they acknowledged that its answers are not completely accurate. This calls for caution in over reliance of ChatGPT in academic activities. According to Wollny et al (2021), the use of chatbots such as ChatGPT boosts students' motivation when teaching lexicology. AI utilization necessitates careful design principles, models and strategies as well as systematic utilization; lecturers must intentionally create lesson packages that consider the characteristics of their students and align with the lesson's objectives. Systematically, ChatGPT can improve students' engagement and performance, especially students from underprivileged backgrounds and maladjustment (Sullivan et al, 2023).

Samer et al (2022) carried out a study to examine Artificial Intelligence (AI) as a predictor of university students' retention. The study evaluated 20 supervised machine learning algorithms in-depth using a dataset from the Kaggle Repository. The study also used 10 variables from 1,100 records of former university students' registrations with trained algorithms. The best-performing algorithm was found to be the NuSVC Classifier after the hyper-parameters were adjusted. With the available dataset, supervised Machine Learning (ML) and Deep Learning (DL) models were created to predict students' retention; the ML models' F1-scores were 90.32%, while the suggested DL model was 93.05%. The findings reveal that ChatGPT and other AI technologies are useful instruments for forecasting students' retention in academic environments.

2.3 ChatGPT AI and Cognitive Ability of Students

The cognitive abilities of students are important ingredients of learning in classroom setting with AI tools such as ChatGPT. At a student level, cognitive ability shows the capacity for reasoning, planning, abstract problem solving, abstract thought, and understanding complicated concepts, maintaining and manipulating complex materials (Giofrè, Coppola, Lucangeli, Cassibba, and Semeraro, 2020). It is the process in which students acquire knowledge through thought, experience and sense during lexicology class. Students with poorer cognitive ability may nonetheless swiftly collect and use instructional messages in task-oriented scenarios when AI language models, like ChatGPT, are incorporated into learning activities. To accomplish things more successfully and efficiently with clear comprehension, the brain may facilitate the process. As a result, during instruction, new concepts, information and abilities may be formed.

Harry et al. (2024) examined the effect of ChatGPT on the cognitive capacities of Ghanaian undergraduate students using AI-based conversational capabilities of the big language model Llama. The study adopted a mixed methods research design. The research design adopted for the study was quasi-experimental research of pretest-posttest control group. The researchers assigned 60 students in the experimental group and 65 in the control group. A sample of 125 students was randomly selected for the study. The results of the finding revealed the need to incorporate ChatGPT in lesson to enhance students' cognitive capacities.

Kabila (2021) advocates that language teachers should consider the use of ChatGPT since it is user-friendly resource that facilitates lexicology instruction. Joen (2022) investigated 26 Korean primary school pupils to see how well ChatGPT improved cognitive abilities in learning English as a foreign language. The study found that students found ChatGPT to be easy to use and interesting, which improved their learning experience. Teachers may find it challenging to successfully integrate ChatGPT into their lesson planning and learning objectives, even though it can enhance students' educational experiences.

2.4 ChatGPT and Academic Performance

A chatbot like ChatGPT uses algorithms that mimic those of a human to analyse instructional content and make difficult concepts easier for students to understand in a variety of subject areas. It facilitates the taking of notes by lecturers by providing students with clear explanations. AI chatbots can assist teachers in communicating concepts more clearly by offering imaginative and detailed explanations. Students who match the lecture scope with the assigned course outlines find this to be especially useful. Additionally, ChatGPT's digital tools can improve academic success and provide adjustment to the demands of individual learner thereby supporting personalized learning in Lexicology (Hashimi et al., 2022).

Togzhan et al. (2023) examined how ChatGPT and other AI tools affected academic performance and found that they might enhance interaction, feedback, assessment and tailored learning. However, the study also noted drawbacks, such as a lack of interpersonal contact, ethical issues and possible prejudices. The

study's conclusion emphasized the need for additional empirical research to completely comprehend how ChatGPT and AI tools affect academic performance. Adewale, Azeta, Abayomi-Alli, and Sambo-Magaji (2024) investigated the effects of ChatGPT and other artificial intelligence on several topic areas, including the use of lexicology and students' academic achievement in open and remote learning.

This study used a sample of 64 studies from a total of 700 papers published between 2017 and 2023 and source registered in Web of Science, Google Scholar, and Scopus to critically evaluate the influence of AI on academic achievement ODL. The meta-analysis found that there were differences in the methodological landscape. The ability of machine learning approaches, which were employed in 29.69% of the research, to predict academic performance is noteworthy. This ability is also present in classic statistical techniques. The study revealed that non-empirical methods, which focus on theoretical analysis and literature reviews, account for a significant 40.63 percent of publications, while hybrid methods, which are less common at 3.13 percent, are a fast-emerging field of research.

This study highlights both the tangible benefits of AI for students' achievement and the significant factors impacting its application in education. The study also identifies a critical gap in the literature: the lack of a process-based framework that can accurately predict the educational impacts of AI, particularly across gender and regional lines. The results paved the way for more inclusive and effective instructional technology in ODL contexts by encouraging more research to create, enhance and test such a framework.

Meniado (2023) carried out a study to explore the effect of ChatGPT on English language teaching, learning, and assessment. Specifically, it aimed to answer the following questions: 1) how can ChatGPT enhance English language learning, teaching and assessment? 2) What are the issues associated with ChatGPT in terms of language teaching, learning, and assessment? Utilizing Rapid Literature Review as a methodology guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, this study found that ChatGPT can support and enhance English language learning by providing meaning-focused inputs, offering scaffoldings during the production of meaning-focused outputs, giving feedback on the accuracy of learners' language outputs, and facilitating fluency development through extensive language practice.

Moreover, this study also found that ChatGPT can enhance English language teaching by assisting teachers in designing bespoke lesson plans, facilitating language learning inside and outside language classrooms, developing customized instructional materials, assessing L2 learning and giving immediate, individualized feedback. However, despite the benefits it can provide to English language teachers and learners, its use in the classroom is faced with many issues such as inaccurate responses, academic dishonesty and plagiarism, skills deterioration, generic responses, inherent biases, privacy breaches, non-emotionality, technical limitations, educational inequity, and teacher job security

threat. Detailed results and implications for policymaking and language teacher development are discussed.

Crisha et al. (2023) investigated the relationship between AI tools and BPED (Bachelor of Physical Education) and students' academic performance. The study which was a correlational research design used a population from first to fourth year students at the Main Campus of Cebu Normal University. A questionnaire which included demographic questions and Likert Scale items was employed for data collection. The finding revealed that academic progress and ChatGPT use are a positively correlated. Secondly, the relationship the use of ChatGPT and other AI tools and students' academic performance was demonstrated by their academic achievements.

3. Research Methods

This research employed a quasi-experimental design of pre-test and post-test non-randomized control groups. The choice of the design was that the students had no equal chance of being assigned to either the experimental or control group, thereby receiving or not receiving the treatment. The students were taken in their intact classes. The researchers aimed to compare students in two groups namely: experimental and control groups. The population consisted of 325 English Education students in the Department of Arts Education, Faculty of Education, University of Calabar, Cross River State, Nigeria for the 2024/2025 academic session. Using Purposive sampling, 295 students were selected for the study based on the criteria that they were in the 300 level and had obtained clearance from the Head of Department to participate in the study.

A Lexicology Performance Test (LPT) was developed by the researchers to collect data consisting of 50 test items with clear five options labelled A to E per item. Every right option was rewarded with 2 points, while the wrong answers were scored 0, giving a total of 100 scores. The LPT was given to the two groups used for the study. To ensure validity, the Lexicology Performance Test (LPT) was reviewed by three high rank lecturers in Language Arts and Educational Foundation Department, Faculty of Education. Reliability was tested using Split Half Method on a pilot group of 30-year 3 Language Arts students, yielding a reliability coefficient of 0.76 after applying the Spearman Brown Prophecy formula.

The researchers used the ASSURE model to develop the instructional package, analysed students' needs and selected appropriate materials. ASSURE is instructional design model that can assist lecturers to develop quality Lexicology package for instruction. This model begins with A- representing analyse learners: here the researchers analyse what the learners should know (identify semantic knowledge, interpret lexical contents and find out the existing knowledge of the learners in Lexicological contents, consider the learning styles and cognitive abilities of learners which were categorized into low, middle and high abilities); S- representing state objectives, the researchers explicitly stated the objectives of the lessons which included analyse word meanings and identifying idiomatic expression; the second S-represents selecting, method and media to be use. Here,

the researchers selected the methods that align with the objectives of the lessons. These methods included lectures, interactive activities and discussion.

ChatGPT text-based medium was considered appropriate for the lesson. The researchers applied the fifth components of the model which is 'Require Learners Participation'. The researchers designed series of activities that requires students to participate in the Lexicology lessons. The students were encouraged to analyse and interpret lexical data. The last component of ASSURE model is E- Evaluate and Revise of content. The lessons' revision was done after the instructional class in Lexicology to measure how well learners' behaviour have been change in terms of their retention and cognitive ability levels of the lessons. Lexicology Performance Test (LPT) was adopted for the evaluation of the lesson package.

Two hundred and ninety-five (295) students (148 in the experimental group and 147 in the control group) were sampled. ChatGPT AI was used to deliver the lesson package to the experimental group, while the control group received traditional instruction. The initial test was administered to the two groups before the treatment. The experiment lasted for one month. Following the instruction, the (LPT) was assigned as a final test to the groups after a one-week interval. This aimed to assess students' retention rates. The completed Lexicology Performance Test scripts (LPTs) were then submitted to the researchers for data collation and data interpretations. The research questions were addressed using Mean and Standard Deviation, while Analysis of Covariance (ANCOVA) was used to test the hypotheses at a 0.05 level of significance.

4. Results

4.1 Research Question 1

What is the difference in the academic performance scores of students taught using ChatGPT and those taught using the conventional expository technique in Lexicology?

Table 1: Comparative Academic Performance of year 3 English Education students in Lexicology

Instructional Difference Strategies	N	Pretest		Posttest		Mean
		Mean	SD	Mean	SD	
ChatGPT	148	86.71	13.85	96.28	14.13	9.57
Expository Method	147	77.62	12.61	85.60	13.28	7.98

Sources: Field Data (2025)

The answers presented in the first Table 1 demonstrate the difference in the mean of 9.57 in academic performance of year 3 students in Lexicology taught using ChatGPT AI, compared to 7.98 for students taught using the traditional expository method. This indicates that students who had lessons in ChatGPT performed better than their conventional counterparts, suggesting a significant effect of ChatGPT AI on academic performance in Lexicology.

4.2 Research Question 2

What is the effect of ChatGPT on students' retention rates in Lexicology?

Table 2: Mean and Standard Deviation of the difference in the academic performance of year 3 English Education students in Lexicology taught using ChatGPT based on retention rates

Instructional Strategies	N	Pretest		Posttest		Mean Difference
		Mean	SD	Mean	SD	
High Retention	85	51.34	8.36	40.97	6.79	10.37
Low Retention	63	43.18	7.28	34.89	5.28	8.29

Sources: Field Data (2025)

The result from Table 2 indicates the difference in mean of academic performance of year 3 students in Lexicology taught using ChatGPT based on high retention of 10.37 while that of low retention was 8.29. This means that Lexicology taught with ChatGPT has higher retention among students.

4.3 Research Question 3

What is the effect of ChatGPT on students' cognitive ability levels in Lexicology?

Table 3: Mean and Standard Deviation of the difference in the academic performance of third-year English Education students in lexicology taught using ChatGPT based on cognitive ability levels

Instructional Difference Strategies	N	Pretest		Posttest		Mean
		Mean	SD	Mean	SD	
Low	38	22.86	4.41	13.62	3.31	9.24
Moderate	88	36.47	5.26	28.19	4.65	8.28
High	22	42.08	6.40	34.90	5.82	7.18

Sources: Field Data (2025)

The result from Table 3 indicates that the difference in mean of academic performance of low, moderate and high cognitive ability of year 3 students taught using ChatGPT. The result showed that the mean difference of low ability students of 9.24 was greater than that obtained by moderate ability students of 8.28 which were also greater than the mean of 7.18 obtained by high ability students. This implies that there is a small difference in the academic performance of students taught using ChatGPT based on cognitive ability level.

4.4 Hypothesis One

There is no statistically significant difference in the academic performance scores of students taught using ChatGPT and those taught using the conventional expository technique in Lexicology.

Table 4: Result of ANCOVA analysis of the difference in the academic performance of year 3 English Education students in Lexicology taught using ChatGPT and those taught using the expository method

Sources Sig.	Type III Sum of Squares	df	Mean Square	Fcrit.	Fcal.
Corrected model .00	5629.35 ^a	2	2814.68	3.84	4.28
Intercept .00	2608.17	1	2608.17		52.38
Pretest Instructional	.34	1	.34	1.78	.62
Strategies	4082.61	1	4082.61	55.70	.00
Error	8438.71	291	29.00		
Total	243821.26	295			
Corrected Total	15281.27	294			

Source: Field Data (2025)

The result from Table 4 reveals that the calculated F-value of 55.70 is greater than the critical F-value of 3.84 at 1 and 293 degrees of freedom and a 0.05 level of significance. With this result, the null hypothesis was rejected. This implies that there is a significant difference in the academic performance of students in Lexicology when taught using ChatGPT and those taught using the expository method. The result from Table 5 reveals that the calculated F-value of 62.41 is greater than the critical F-value of 3.84 at 1 and 146 degrees of freedom and a 0.05 level of significance. With this result, the null hypothesis was rejected. This implies that there is a significant difference in the academic performance of year 3 English Education students in Lexicology taught using ChatGPT AI based on retention rates.

4.4 Hypothesis Two

There is no statistically significant effect of ChatGPT on students' retention rates in Lexicology.

Table 5: Result of ANCOVA analysis of the difference in the academic performance of year 3 English Education students in Lexicology taught using ChatGPT based on their retention rates

Sources	Type III Sum of Squares	df	Mean Square	Fcrit.	Fcal.	Sig.
Corrected model	2018.68 ^a	2	672.89	3.84	4.01	.00
Intercept	6152.01	1	6152.01		121.34	.00
Pretest Retention	46.27	1	46.27		1.98	.21
Rates	96.31	2	48.16		62.41	.00
Error	5036.92	144	34.98			
Total	618261.27	148				
Corrected Total	8901.71	147				

Source: Field Data (2025)

4.5 Hypothesis Three

There is no statistically significant effect of ChatGPT on students' cognitive ability levels in Lexicology.

Table 6: Result of ANCOVA analysis of difference in the academic performance of year 3 English Education students in Lexicology taught using ChatGPT based on their cognitive ability levels

Sources	Type III Sum of Squares	df	Mean Square	Fcrit.	Fcal.	Sig.
Corrected model	2163.44 ^a	3	721.15	3.84	3.95	.24
Intercept	6100.36	1	6100.36		120.51	.00
Pretest	54.37	1	54.37		1.96	.21
Cognitive Abilities	76.81	2	38.41		3.02	.31
Error	4926.08	144	34.21			
Total	618261.27	148				
Corrected Total	8901.71	147				

Source: Field Data (2025)

The result presented in Table 6 indicates that the calculated F-value of 3.02 is less than the critical F-value of 3.84 at 1 and 146 degrees of freedom and a 0.05 level of significance. With this result, the null hypothesis was rejected. This implies that there is no significant difference in the academic performance of students in Lexicology taught using ChatGPT AI based on cognitive ability levels.

5. Discussions

5.1 Academic Performance of Year 3 English Education Students in Lexicology using ChatGPT AI and those taught with Expository Method

The academic performance of year 3 English Education students studying Lexicology who were taught using ChatGPT and those who were taught using the expository approach differed significantly according to the result summary in table 4. This suggests that students studying English education who used ChatGPT performed better. The fact that ChatGPT AI offers insight into the most recent lexicological information may be the cause of the excellent performance. It is a sign that the AI chatbot offers students sufficient resources to assist instructors in creating educational materials that are superior to the expository class that relied on textbooks and lecture notes.

Hwang et al. (2020), who proposed that ChatGPT AI improved lecturers' teaching methods as well as students' performance and experience, corroborates with this finding. According to Crisha et al. (2023), there is a positive association between using ChatGPT and academic success. This result was further supported by Hashimi et al. (2023) who asserted that ChatGPT's digital tools can improve academic success and provide adjustment to the demands of individual learner thereby supporting personalized learning in Lexicology. Togzhan et al. (2023) also examined how ChatGPT and other AI tools affected academic performance and found that they might enhance interaction, feedback, assessment and tailored

learning. It also showed that the impact of AI tools like ChatGPT on students' academic performance was evident in their academic accomplishment.

5.2 Academic Performance of Year 3 English Education Students in Lexicology using ChatGPT AI based on Retention Rates

Based on retention rates, the results summarized in Table 4 showed a substantial difference in the academic performance of students learning Lexicology with ChatGPT AI. This suggests that following a week of instruction, students' retention rates in the ChatGPT AI course increased. This is a result of ChatGPT AI's integration of a variety of resources and instructional techniques, including prompt explanation, demonstration and conversation. Students' memory of lexicology was improved by these crucial instructional techniques.

The study's findings support the findings of Lasha et al. (2023), who established that ChatGPT AI significantly improved students' learning performance, through explicit reasoning and lexicological knowledge retention. This study was supported by Abigail, Kirian Victoria, and Edidiong (2024) who claimed that the advent of ChatGPT and other AI resources has made artificial intelligence easier to assess students' retention during the teaching process. Ngonso, Ukhurebor, and Nduehi (2025) supported that Majority of Nigerian students who use AI and GAI have positive effects on academic performance and retention. The result of this study also supports that of Samer et al. (2022) who asserted that ChatGPT and other AI technologies are useful instruments for forecasting students' retention in academic environments.

5.3 Academic Performance of Year 3 English Education students in Lexicology using ChatGPT AI based on Cognitive Ability Levels

Based on the cognitive ability levels of the students, there is no significant difference in the academic performance of students in Lexicology taught with ChatGPT AI, according to the results summary in table 6. This suggests that students with poor cognitive capacity were more affected by ChatGPT AI than students with moderate and high cognitive ability. This might be explained by the low-cognitive students' cueing effects on the educational package that the lecturers created for the interactive ChatGPT AI session. Additional benefits were generated by the package design for ChatGPT AI's instant explanation messages.

This present study supports the findings Semeraro et al. (2020), who proved that when they discussed in task scenarios during the ChatGPT AI course, students with low cognitive capacities could quickly recall collect, use information and retained instructional messages. This study was supported by the empirical work of Harry et al. (2024) who examined the effect of ChatGPT on the cognitive capacities of Ghanaian undergraduate students using AI-based conversational capabilities of the big language model Llama. The study adopted a mixed methods research design. The research design adopted for the study was quasi-experimental research of pretest-posttest control group. The researchers assigned 60 students in the experimental group and 65 in the control group. A sample of 125 students was randomly selected for the study. The results of the finding revealed the need to incorporate ChatGPT in lesson to enhance students' cognitive capacities.

6. Conclusion

The study conclusively demonstrates that integrating ChatGPT AI into Lexicology instruction significantly enhanced the academic performance, retention and cognitive abilities of year 3 English Education students. The findings indicated that students taught with ChatGPT outperformed their counterparts in traditional expository methods, with notable improvements in post-test scores and retention rates. This suggests that AI-powered tools like ChatGPT can provide personalized, resource-rich learning environments that facilitate better understanding and longer-lasting knowledge retention.

Furthermore, the absence of notable variations according to cognitive ability levels suggests that ChatGPT works well for a variety of learner profiles, with students with lower cognitive abilities benefiting most from its instant explanations and interactive involvement. These results highlight how AI-driven teaching methods could change language instruction by increasing learning effectiveness, accessibility, and engagement. Notably, variations in performance and retention support the claim that ChatGPT can be surplus to conventional teaching techniques, helping both instructors and students reach better learning outcomes.

The study emphasizes the significance of extending research into AI applications in other fields, like computing and engineering, where comparable advantages may be realized. To ensure ethical use and optimize educational advantages, the study also highlights the necessity for educators and policymakers to create formal frameworks that successfully incorporate AI tools like ChatGPT into English Language curriculum. AI's influence inclusive, dynamic, and customized learning environment which is becoming increasingly important as the technology develops.

Future research should concentrate on developing best practices for responsible deployment, evaluating long-term effects on students' accomplishment and improving AI pedagogical models. All things considered, this study confirms that ChatGPT has the revolutionary capacity to improve learning outcomes and academic achievement in higher education environments.

7. Implications and Recommendations

Based on the findings of the study, the following implications and recommendations were made.

1. Universities should encourage academic staff training on the use of 21st century technology strategies such as ChatGPT to improve students learning outcomes.
2. English Language Lecturers should blend their course materials with chatbots including ChatGPT to create a balance and standard on what students should learn at their academic level to promote their language skills.
3. Students with low cognitive abilities should be encouraged to blend their lecturers' materials with modern technologies such as ChatGPT to improve their learning skills and abilities during study.

4. The study also recommended that seminars should be conducted for lecturers and students on the use of AI powered learning tools particularly ChatGPT and be incorporated into the English Language curriculum especially in Lexicology and writing to create awareness.

8. Conflict of Interest

The researchers declare that there is no conflict of interest regarding the publication of this study. All data were collected and analysed objectively without any bias or undue influence from any external organization or individual.

9. Acknowledgements

The researchers express sincere gratitude to all individuals and institutions who contributed to the successful completion of this study.

10. References

- Abdellatif, H., Al Mushaiqri, M., Albalushi, H., Al-Zaabi, A. A., Roychoudhury, S., & Das, S. (2022). Teaching, learning and assessing anatomy with artificial intelligence: The road to a better future. *International Journal of Environmental Research and Public Health*, 19(21), 14209. <https://doi.org/10.3390/ijerph192114209>
- Abubakar, Y. (2021). The challenges of teaching English Language Lexicon and structure. *African Journals of Humanities and Social Science*, 21,(6), 205-226.
- Ade-Ibijola, A., & Okonkwo, C. (2023). Artificial intelligence in Africa: Emerging challenges. In *Creative Commons Attribution 4.0 International*, 101-117. https://doi.org/10.1007/978-3-031-08215-3_5
- Adewale, M. D., Azeta, A., Abayomi-Alli, A., & Sambo-Magaji, A. (2024). Impact of artificial intelligence adoption on students' academic performance in open and distance learning: A systematic literature review. *Heliyon*, 10,(22), e40025. <https://doi.org/10.1016/j.heliyon.2024.e40025>
- Alia Sa'ad, E. A., Abdelhadi, A., Omar, A., & Basim, A. (2023). AI-driven technology and chatbots as tools for enhancing English language learning in the context of second language acquisition: A review study. *International Journal of Membrane Science and Technology*, 10,(1), 1209-1223. <https://doi.org/10.15379/ijmst.v10i1.2829>
- Belda-Medina, J., & Calvo-Ferrer, J. R. (2022). Using chatbots as AI conversational partners in language learning. *Applied Sciences*, 12, (17), 8427. <https://doi.org/10.3390/app12178427>
- Chuah, K. M., & Kabilan, M. K. (2021). Teachers' views on the use of chatbots to support English language teaching in a mobile environment. *International Journal of Emerging Technologies in Learning*, 16,(20), 223-237.
- Crisha Mae, B. P., Jaya, M. A., Nikkie-Rose, A. B., Alresh, T. C., Ma Eloisa, R. E., Jazzyca, B. O. E., Lenell Joy, R. M., & Jorjie, N. (2023). Artificial intelligence as a tool in increasing academic performance. *International Journal of Advanced Multidisciplinary Research and Studies*, 3,(6), 1151-1155. *Educational Technology in Higher Education*, 18,(33), 237-257. <https://doi.org/10.1186/s41239-021.00269-8>
- Ezeaghasi, N. E., & Obochi, U. M. (2025). Impact of generative artificial intelligence strategy on retention and performance in biology among Federal University of Education Zaria students, Kaduna State, Nigeria. *Official Journal of Faculty of Education, Federal University Gusau, Zamfara State, Nigeria*, 5,(3), 90-96. <https://doi.org/10.64348/zije.202536>
- Harry, B. E., Dimitrios, V., Albert, B. E., & John, O. A. (2024). ChatGPT effects on cognitive skills of undergraduates students: Receiving instant responses from AI-based conversational large language models. *Computer and Education: Artificial Intelligence*, 6, 100198. <https://doi.org/10.1016/j.caeai.2023.100198>

- Hashim, S., Omar, M. K., Ab Jalil, H., & Amp, M. S. (2022). Trends on technologies and artificial intelligence in education for personalized learning: *A systematic review. International Journal of Academic Research in Progressive Education and Development, 12*,(1), 884-903.
- Ho, P. P. X. (2024). Using ChatGPT in English language learning: A study on I.T. students' attitudes, habits, and perceptions. *International Journal of TESOL & Education, 4*,(1), 55-68. <https://doi.org/10.54855/ijte.24414>
- Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education: Promises and implications for teaching and learning*. Boston: Center for Curriculum Redesign.
- Inmaculada G. M., Jose-Maria F. B., Jose-Fernandez, C., & Samuel, P. L. (2023). Analyzing the impact of artificial intelligence and computational science performance: A systematic review and meta-analysis. *Journal of New Approach in Educational Research, 12*,(1), 171-197.
- Jalon, J. B., Chua, G. A., & Torres, M. L. (2024). ChatGPT as a learning assistant: Its impact on students' learning and experiences. *International Journal of Education in Mathematics, Science, and Technology (IJEMST), 12*,(6), 1603-1619. <https://doi.org/10.46328/ijemst.4471>
- Jamshed, M., Ahmed, A. S. M. M., Sarfaraj, M., & Warda, W. U. (2024). The impact of ChatGPT on English language learners' writing skills: An assessment of AI feedback on mobile. *International Journal of Interactive Mobile Technologies (ijIM), 18*,(19), 18-36. <https://doi.org/10.3991/ijim.v18i19.50361>
- Jang, J. (2022). Exploring AI chatbot affordances in the EPL classroom: Young learners' experiences and perspectives. *Computer Assisted Language Learning*. <https://doi.org/10.1080/09588221.2011.2021241>
- Japneet, D., & Manju, S. (2023). Impact of AI on design students' cognitive learning. *International Journal of Creative Research Thoughts, 11*,(9), 1-5.
- Kasneeci, E., SeBler, K., Kechemann, S., Bannert, M., Dementieva, D., Fischer, E., Gasser, U., Groh, G., Gunnermann, S., & Hullemeier, E. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Journal of Learning and Individual Differences, 103*, 102274. <https://doi.org/10.1016/j.lindif.2023.102274>
- Krzysztof, Z. G., & Lena, M. (2022, March 22-25). Do people engage cognitively with AI? Impact of AI assistance on incidental learning. In *Proceedings of the 27th International Conference on Intelligent User Interfaces (IUI'22)*,(pp. 1-13). ACM. <https://doi.org/10.1145/3490099.3511138>
- Lasha, L., Maya, G., & Lela, M. (2023). Role of AI chatbot in education: A systematic literature review. *International Journal of Educational Technology in Higher Education, 20*,(1), 56. <https://doi.org/10.1186/s41239-023-00426>
- Lingfei, L., Xi, L., & Yan, D. (2025). Bridging the gap: ChatGPT's role in enhancing STEM education. *Open Praxis, 17*,(1), 108-128. <https://doi.org/10.55982/openpraxis.17.1.685>
- Lund, B. D., & Wang, T. (2023). Chatting about ChatGPT: how may AI and GPT impact academia and libraries? *Library Hi Tech News, 40*(3), 26-29
- Mathew, A. (2023). Is Artificial Intelligence a World Changer? A Case Study of OpenAI's Chat GPT. *Recent Progress in Science and Technology Vol. 5*, 35-42.
- Meniado, C., J. (2023). The Impact of ChatGPT on English Language Teaching, Learning, and Assessment: A Rapid Review of Literature (December 15, 2023). *Arab World English Journals (AWEJ), 14*. (4). <https://ssrn.com/abstract=4676585>
- Nduneche, E., & Akinsulire, A. (2024). Investigating the awareness and adoption of ChatGPT as a learning tool among undergraduates in Lagos State, Nigeria. *International Journal of Education, Learning and Development, 12*,(9), 134-154. <https://doi.org/10.37745/ije1d.2013/Vol12n9134154>
- Nga, L. T. T., & Dang, H. H. (2024). Leveraging ChatGPT for English language teaching: A pedagogical perspective. <https://doi.org/10.37896/YMER23.02/57>

- Ngonso, B. F., Ukhurebor, K. E., & Nduehi, I. (2025). Influence of artificial intelligence in educational performance of Nigeria students in tertiary institutions. *Journal of Infrastructural Policy and Development*, 9,(1), 9949
- Okan, Y., & Hidir, K. (2024). The effect of AI-powered chatbots in social studies education. *Education and Information Technology*,29,17035-17069(2024). <https://doi.org/10.1007/s10639-024-12485-6>
- Olumide, O. (2024). Exploring factors influencing Nigerian higher education students to adopt ChatGPT in learning using information and communication technology. *International Journal of Education and Development (IJEDICT)*, 20,(3), 39-59.
- Ray, P. P. (2023). ChatGPT: A comprehensive review on background, applications, key challenges, bias, ethics, limitations, and future scope. *Internet of Things and CyberPhysical Systems*, 3, 121–154. Doi: 10.1016/j.iotcps.2023.04.003.
- Samer, M. A., Eman, A. Z., Anees, H. R., & Basem, S. A. (2022). Predicting university students' retention using artificial intelligence. *International Journal of Advanced Computer Science and Application*, 13(9), 1-15. <https://doi.org/10.14569/IJACSA.2022.0130937>
- Semeraro, C., Giofrè, D., Coppola, G., Lucangeli, D., & Cassibba, R. (2020). The role of cognitive and non-cognitive factors in mathematics achievement: The importance of the quality of the student-teacher relationship in middle school. *PLoS ONE*, 15,(4), e0231381. <https://doi.org/10.1371/journal.pone.0231381>
- Shittu, O. I., Busari, D. A., & Olonade, O. Y. (2025). Knowledge, attitude, and perception of learners towards the use of ChatGPT in the University of Ibadan, Nigeria. *International Journal of Sociology of Education*, 14,(2), 146–168. <http://dx.doi.org/10.17583/rise.15313>
- Silva, C. A. G. D., Ramos, F. N., de Moraes, R. V., & Santos, E. L. D. (2024). ChatGPT: Challenges and benefits in software programming for higher education. *Sustainability*, 16, (3), 1245.
- Smith, J. (2020). The components of the academic environment in higher education institutions. *Journal of Higher Education Studies*, 15,(2), 123-145.
- Stanford Graduate School of Education. (2024). Chatbot as a teaching tool. <https://www.teachingresources.stadford.edu>
- Sullivan, M., Kelly, A., & McLaughlan, P. (2023). ChatGPT in higher education: Consideration for academic integrity and student learning. *Journal of Applied Learning & Teaching*, 6,(1). <https://journals.sfu.ca/jalt/index.php/jalt/index>
- Tetiana, H. (2022). Key problem of lexicology in higher education. *International Journal of Social Science and Humanity Research*, 5, (8), 3622-3629. <https://doi.org/10.47191/ijsshr/v5-i8-37>
- Uguma, V. U. & Timothy, A. E. (2023). Flipped classroom instructional strategy: An innovative pedagogy for enhancing English Language. *EKSUJOE Journal of Education*, 10, (1)" 140-144
- Uguma, V. U. & Ukume, G. D. (2019). Industrial action by teachers: Impact on secondary school students performances in English Language. *International Journal of Multidisciplinary Research and Development*, 6(1),12-16
- Ukume, G. D.& Uguma, V. U. (2024). Effect of power point presentation and SEs constructivist instructional approach in enhancing summary, writing. *Prestige Journal of Counseling Psychology*,7, (2),15-29
- Ukume, G. D., Edu, G. O. & Uguma, V. U. (2025). Digital technology in language teaching; Using animation and interactive whiteboard to enhance pupils' performance in English Vocabulary. *Nigeria Journal of Literacy and English Education*, 2(3), 86-97
- UNESCO. (2019). The sustainable development goals report. <https://bit.ly/34nb960>
- Vazquez Cano, E., Mengual Andres, S., & Lopez Meneses, E. (2021). Chatbot to improve learning punctuation in Spanish and to enhance open and flexible learning environments. *International Journal of Educational Technology in Higher Education*, 18,(33), 237-257. <https://doi.org/10.1186/s41239-021.00269-8>

- Wollny, S., Schneider, J., Di Mitri, D., Weidlich, J., Rittberger, M., & Drachsler, H. (2021). Are we there yet? –A systematic literature review on chatbots in education. *Frontiers in Artificial Intelligence, 4*, 654924.
- Zhang, R., Zou, D., & Cheng, G. (2023). A review of chatbots-assisted learning: Pedagogical approaches, implementation, factors leading to effectiveness, theories, and future directions. *Interactive Learning Environments, 32*, 9, 1-29. <https://doi.org/10.1080/10494820.2023.2202704>