Àgídìgbo: ABUAD Journal of the Humanities Vol. 13 No. 1, 2025 E-ISSN: 3043-4475 pp.303-326

Language and Communication Implications of Artificial Intelligence on Selected Nigerian University Undergraduates

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Abstract

In recent times, the emergence of artificial intelligence has had a tremendous influence on human language and communication. It involves developing computer programmes to complete tasks which would otherwise require human intelligence. This study, therefore, investigates the impact of artificial intelligence on the English language use and communication skills of selected Nigerian university undergraduates. Questionnaires were designed using a five-point rating scale and shared with one hundred and fifty respondents from the University of Nigeria, Nsukka and the University of Nigeria, Enugu Campus. These students were randomly sampled because they were selected without having any particular choice in mind. All the responses gathered through an online SurveyMonkey survey were categorised and analysed qualitatively and quantitatively. Albert Bandura's (1977) Social Learning Theory was adopted as the theoretical framework for this study. The findings show that artificial intelligence impacts the language and communication of Nigerian undergraduates both positively and negatively, and this includes, among others, improvement of their vocabulary and grammar, and overdependence on AI technology for English language vocabulary development.

Keywords: Artificial Intelligence, Language and Communication, University students, Social Learning Theory.

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1. Introduction

Since the evolution of humans, man has had the natural ability and instinct for communication, as this sets him apart from other animals due to the shape of the larynx, which allows for the production of intelligible sounds. Language originated as communication; in other words, language is first and foremost a social tool (Fitch, 2010, p.393).

However, in recent times, the emergence of artificial intelligence has had a tremendous influence on human language and communication. Artificial intelligence is a branch of computer science. It involves developing computer programmes to complete tasks which would otherwise require human intelligence (Mohammed, 2019). The term artificial intelligence was coined by John McCarthy in 1955. He defined it as "the science and engineering of making intelligent machines" (p.1). It is the ability to hold two different ideas in mind at the same time and still retain the ability to function (Singh *et al.*, 2013). It refers to systems that display intelligent behaviour by analysing their environment and taking action with some degree of autonomy to achieve specific goals (Boucher, 2020). Artificial intelligence algorithms can tackle learning, perception, problem-solving, language understanding and logical reasoning (Mohammed, 2019). Artificial intelligence can be used in many ways within the modern world, from personal assistants to self-driving cars. This is why so many people are dazzled by its capabilities and ability to do human tasks, and also speak human languages. Artificial intelligence is now widely used to facilitate social interaction. It changes how people interact with and perceive one another in pro-social and anti-social ways. By using algorithmic responses, communication efficiency increases, encouraging the use of positive emotional language and positive evaluations by communication partners. One of the most visible AI applications is AI-generated reply suggestions in text-based communication, commonly known as a smart replies, which appear to help users compose messages with "just one tap" (Hohenstein *et al.*, 2023).

Since communication is the basic process through which people form perceptions of others, build and maintain social relationships and achieve cooperative outcomes, generative AI that draws from large language models (LLMS) is poised to fundamentally change how one communicates (Hohenstein *et al.*, 2023). AI applications such as chatbots, visual assistants, ChatGPT, and Ask-AI are increasingly used to produce any kind of language, from text messages and social media posts to computer programmes and speeches. It also answers our questions and speaks with us in a manner we understand (Hohenstein *et al.*, 2023). One of the most pervasive applications nowadays is personalised reply suggestions in text-based communication, commonly known as smart replies. Smart reply systems aim to make text production more efficient by drawing on general text corpora to predict what a person might type and generate one or more suggested responses that the person can choose from when responding to a message.

AI has focused on how to reproduce aspects of human intelligence, including the ability to communicate, within the machine (Frankish & Ramsey, 2014). Nowadays, the gap between artificial intelligence and communication research is narrowing, bridged by AI technologies

designed to function as communicators (Guzman & Lewis, 2020). Recent advances in artificial intelligence have led to more powerful and consequential AI technologies being integrated across daily life (Campolo *et al*., 2017). Individuals routinely chat with Amazon's Alexa, Apple's Siri, Google Assistant, and other digital assistants and people's interactions with smart devices are expected to grow along with the emerging internet of things (Rainie & Anderson, 2017). Therefore, AI is currently becoming increasingly available in healthcare and finance organisations, government offices, schools and numerous organisations that employ various AI-powered tools to enhance their processes.

Artificial intelligence has already been applied widely in different functions of higher education. It cuts across teaching and learning, research, administration and community engagement due to its ability to generate and access information. AI can play a range of roles in teaching and learning processes. AI can improve the process and experience of learning for students. To do so, it is used as a stand-alone tool or can be integrated into other systems and platforms. AI also performs many simple or technical tasks like basic research, calculations, proofing and so on. Artificial intelligence can be used by researchers at different stages of the research process, such as reviewing academic papers and so on. Artificial intelligence helps in improving administration due to its ability to complete huge and demanding tasks, respond to queries from students, help students sign up for courses, complete course requirements, check administrative information like exam timetables, location of classes and so on (Sabzalieva & Valentini, 2023).

Artificial intelligence and its impact on language and communication have from the outset engaged the attention of researchers. This is evident in the fact that scholars such as Hohenstein *et al.* (2023), Tuomi (2018), Dewi *et al.* (2021), and Ali (2020), among others, have carried out research aimed at finding out how artificial intelligence has affected the language and communication of human beings. This has resulted in many interesting findings. Although most of their works have been centred on the impact of artificial intelligence on English foreign language learners (Li *et al.*, 2020), English communication professionals (López & Ouariachi, 2020), and European English communication practitioners (Zerfass *et al.*, 2020), among others. It is against this backdrop that this study fills this missing research gap by examining the impact of artificial intelligence on the language and communication, vocabulary and grammar of selected Nigerian university undergraduates both in person and online.

2. Studies on the Impact of Artificial Intelligence on Language and Communication.

Alhalangy and AbdAlgane (2023) carried out a study on the possible use of artificial intelligence in English for speakers of other languages (ESOL) courses. The purpose of the research is to know whether or not it is possible to utilise AI-mediated tools like intelligent teaching systems, self-regulated learning, virtual reality, immersive virtual environments and natural language processing in teaching English as a foreign language in classrooms. The study adopted a descriptive-analytical methodology after distributing a questionnaire to 45 male and female

English as a foreign language (EFL) teachers working in a variety of universities in Saudi Arabia. The result shows that the ethical responsibility for making the most effective use of AI now falls on both educators and students themselves. It concludes that artificial intelligence has a positive impact on the field of English language teaching (ELT) and learning. Also, it suggests that AI needs to be better integrated into educational settings. This study is related to the present work because the duo studied the impact of AI on the English language, but differs in the type and size of the population and the environment the research was conducted.

Dewi *et al.* (2021) in a research on the use of artificial intelligence in English learning among university students in the Department of English at Universitas Airlangga aimed to analyse an artificial intelligence platform that can be used in providing education and accessing student grades. It adopted a qualitative research design, which is conducted with a library study approach and interviews among students of the university who used AI for English language learning to find their opinions on the roles AI plays in them. After all interviews and observations, the researchers discovered that AI technology can be used as a means of developing English learning for students and concluded that it is important for educational institutions to consider the advancement of AI-based learning to enhance performance and innovation.

Again, Rusmiyanto *et al.*'s (2023) research goal is to look at the existing research and literature on the use of AI-based technologies in English language learning environments. The study tends to achieve this by employing a literature review approach to gather and analyse relevant studies on the topic. The approach involves the analysis and synthesis of existing research and scholarly literature. The study concludes that AI has the potential to significantly enhance English language learners' communication skills by providing personalised and interactive learning experiences. The above studies are all related to the current study in terms of studying AI on the communication of language users, but differ in the environment of research and the type of population involved.

Similarly, Hohenstein *et al.* (2023) investigate the social consequences of one of the AI's applications called "smart replies," which is used to send billions of messages each day. They conducted two random experiments among a total number of 1020 Mechanical Turk crowd workers between the ages of 18 and 68 through a Qualtrics online survey to find how smart replies affect the way people interact and perceive each other. This study has implications for theory in communication and psychology. After all the experiments in the two studies carried out, they found that generative AI, including a commercially deployed AI system, can have a significant impact on how people communicate, with both positive and negative consequences. It then concludes that it is important for researchers and practitioners to consider the broader social consequences when designing algorithms that support communication.

The above work is slightly similar to the current study in that it examines AI in language use and communication settings, but they both differ in that the above work is focused on the social impact of a smart reply system as an AI communication tool on human communication

while the current study examines the impact AI has on Nigerian students' English language use and communication skills.

Furthermore, Ali's (2020) paper was concerned with reviewing the uses of AI in language teaching and learning. In particular, it reviews the research on the uses of AI and its application in the learning and teaching of language. The study incorporates a qualitative research approach, specifically content analysis, which is employed as the technique to review the articles that are obtained from relevant databases. Findings from the study revealed that four (4) themes emerged in the use of AI in relation to teaching and learning a language. The uses of AI for pedagogy, therefore, prove that its uses ease language teaching and learning. This study is somewhat related to the present study in that both studies are AI and language and make use of content analysis but they both differ as the above work focuses on AI application in language teaching and learning while the current study is focused on the implication of AI on the English language communication of Nigerian undergraduates.

Similar to Ali's (2020) study, Lehlou and Brigui (2021) investigate the effectiveness of AI in teaching and learning languages using the PPTL strategy (Programming-Playing-Teaching/Learning). The study was quantitative in nature and was done by distributing questionnaires to 151 trainee teachers (male and female) because they have more experience and are expected to become future teachers according to the study. Unlike Ali's research which adopted a qualitative approach, Lehlou and Brigui above used the answers from the questionnaire shared during the research to address the research question on whether the implementation of the PPTL as a form of AI in teaching and learning languages can lead to a positive result particularly affecting the linguistic competence and performance when compared to the traditional method of teaching and learning. This study adopted the connectivism theory as its framework. The results gathered from the questionnaire show that the PPTL strategy is more effective in the teaching and learning process and that AI as a whole can be of good use in teaching and learning languages.

The reviewed work is related to the present one, such that the two are studying AI and language. However, the reviewed work studies the effect of PPTL as an AI application on teaching and language learning and distributes its questionnaire to trainee teachers, while the current research studies the effect of AI on English language and communication amongst Nigerian undergraduates and distributes its questionnaire to Nigerian university students.

Seo *et al.*'s (2021) study aims to explore areas where AI systems positively contribute to learner-instructor interaction and where more attention is required. This study uses an exploratory research method comprising speed dating with storyboards to analyse the authentic voices of 12 students and 11 instructors on diverse use cases of possible AI systems in online learning and also conducted semi-structured interviews with them via Zoom. They used a Reflexive Thematic Analysis approach to analyse the data for the study. Findings show that participants envision adopting AI systems in online learning can enable personalised learner–instructor interaction at scale, but at the risk of violating social boundaries. This study is

slightly related to the present work in that both study the impact of AI on student interaction but they both differ in the sense that the current study focuses on the impact of AI on the language and communication of Nigerian university students whereas the reviewed work focuses on the impact of AI system on student-instructors' interactions in online learning.

In addition, Lopéz and Ouariachi (2020) studied the current and growing impact of artificial intelligence and automation on the role of communication professionals. The study involves methodological triangulation, analysing and comparing data gathered from interacting with experts (communication professionals) using the Delphi method, and focus group discussions with communication students. This was done to be able to understand the professionals' experiences, perspectives and concerns regarding the impact of AI and automation on their work and the ethical implications that arise. The findings of the study revealed the likely impacts and the enhancement of efficiency and productivity among professionals. This study is related to the present work because both studies acknowledge the influence of AI on the field of communication, but while the present work focuses on the impact of AI on language and communication among Nigerian university students, the reviewed study examined the impact of Artificial Intelligence and automation on communication professionals.

Zerfass *et al.*'s (2020) study aims to present insights into how professionals in the field of AI access the technology. They carried out this study with the notion that academic discourse lacks an investigation of the perspective of practitioners. The study adopted a quantitative research design in carrying out a cross-national online survey among 2,689 European communication practitioners, with a majority having more than ten years' experience in communication. The data was analysed using the Statistical Package for the Social Sciences (SPSS). The study discovers a limited understanding of AI and expects the technology to impact the profession as a whole more than the way their organisations or themselves work. It then concludes by highlighting the need for communication managers to educate themselves and their teams about the technology and to identify the implementation of AI as a leadership issue. With the analysis being deployed in the study, the research focuses more on the adoption, knowledge, impact, challenges and risks of artificial intelligence in a communication context, but the current study focuses more on the implications of artificial intelligence on English language communication and interaction among Nigerian university undergraduates.

Also, Li *et al.* (2020) focus on the impact of an artificial intelligence (AI)-based speech recognition system on the pronunciation skills of English Foreign Language (EFL) learners. The study employed a quasi-experimental design, with a control group and an experimental group, in order to compare the effectiveness of the AI-based system. The participants of the study were 160 EFL learners from a university in China. The experimental group utilised the AI-based speech recognition system, which provided immediate feedback on their pronunciation, while the control group received traditional instruction without the aid of the system. The pronunciation skills of both groups were assessed using pre-and post-tests, which involved reading aloud and recording specific sentences. The findings of the study

indicated that the EFL learners who utilised the AI-based speech recognition system showed significant improvement in their pronunciation skills compared to the control group. The study then concludes that integrating AI-based speech recognition systems into EFL instruction can be an effective approach to improving learners' pronunciation skills.

It is apparent from the reviewed works above that there have been numerous studies on how AI influences language and interactions. However, the majority of works on artificial intelligence have not taken into consideration its impact on students in Nigerian universities, nor has anyone, to the best of the researcher's knowledge, considered examining the implications of AI on English language communication and social interactions of Nigerian university undergraduates. This is, therefore, the void this study intends to fill.

3. Theoretical Framework

This study benefits from Albert Bandura's (1977) **Social Learning Theory**. The social learning theory was first described by the psychologist Albert Bandura in 1977 in his work "*Social Learning Theory*" and was reverberated by him as well in 1986 in his work "*Social Foundations of Thought and Action: A Social Cognitive Theory*" and further, in 2001 in *his work, "Social Cognitive Theory: An Agentic Perspective*". According to him, the theory projects that individuals acquire behaviours, attitudes and skills not only through direct experiences but also by observing and imitating the actions of others within their social environments, emphasising the role of cognitive processes, motivation and reinforcement. Contrary to other behavioural learning theories that rely on experience as a source of learning, Bandura's Social Learning Theory proposed that learning can occur simply by observing others' actions (Fryling *et al.*, 2017). The basis of Bandura's idea of learning is observation. The development of learning occurs in three stages: observation, intrinsic reinforcement and the modelling process. The social learning theory is divided into different aspects through which the occurrence of learning in human beings can be traced. These aspects include attention, retention, reproduction and motivation.

Attention is the initial process of actively focusing on and observing a model's behaviour. It involves direct cognitive resources to absorb the details of the behaviour being demonstrated. For instance, when a student watches a YouTube video where a language expert demonstrates effective communication strategies using AI, the student pays close attention to the expert's use of vocabulary, tone and articulation. The capacity to remember and store observed behaviours or information for future use is examined under retention.

Retention is crucial for later reproduction. When individuals retain what they have observed, they create a mental representation of the behaviour, enabling them to recall it when needed.

Reproduction is another aspect of the Social Learning Theory. Bandura explains this to mean that when an individual learns by imitating and replicating observed behaviours. It usually occurs when one observes behaviour demonstrated by a model, whether in person or through media, they have the capacity to reproduce that behaviour by translating the observed actions

into their own actions. Nabavi and Bijandi (2012) explained this as an observer being able to duplicate the action of a model, which may be difficult for a student who is not developmentally equipped to do so. For example, after watching the tutorial video explained above in the "attention" process, the student mentally rehearses the new communication techniques demonstrated by the language expert. They can **recall** and **reproduce** these techniques when engaging in real conversations.

Finally, **motivation** is that which encompasses the internal or external factors that drive individuals to engage in certain behaviours. This motivation occurs via reinforcement, of which Bandura proposes three different types: direct reinforcement, vicarious reinforcement and self-reinforcement. For example, the student's motivation to incorporate the learned communication strategies into daily interactions increases when they receive compliments from peers for their improved language skills. The positive feedback motivates them to consistently apply the demonstrated techniques (Bandura, 2001).

The basis of Bandura's idea of learning is observation. The development of learning occurs in three stages: observation, intrinsic reinforcement and the modelling process. Observation occurs from actions displayed by different models like live model, virtual model, symbolic model and others. Human beings learn by observation and imitation of others or things around them. All this leads to learning.

In summary, the theory of social learning accounts for the learning of human beings through observation and imitation of others. Observation occurs from actions displayed by different models like live model, virtual model, symbolic model and others. Human beings learn by observation and imitation of others or things around them. For this study, **reproduction,** which is one of the categories for observational learning of humans in this theory, was incorporated in the analysis.

4. Methodology

The participants for this study were 150 undergraduate students of the University of Nigeria, Nsukka (UNN) and the University of Nigeria, Enugu Campus (UNEC). These students were randomly selected without any consideration for their departments, since it is believed that they are all exposed to the use of AI. The choice of the selection of the two universities (UNN and UNEC) is because they are good examples of Nigerian universities with diverse student populations, and they can show how different students from different backgrounds learn and use AI for English language and communication.

The responses for this study were gathered from five-point scale questionnaires containing thirty (30) questions shared among one hundred (100) undergraduates of the University of Nigeria, Nsukka (UNN) and fifty (50) undergraduates of the University of Nigeria, Enugu Campus (UNEC). The data from UNN was specifically from twenty (20) respondents each from first and second-year classes, making it a total of 40 respondents, and thirty (30) respondents each from third and final-year classes, making it a total of 60. This equates to a

total of one hundred (100) respondents from UNN. All were randomly selected from any department.

The data from UNEC was made up of ten (10) respondents each from first and second-year classes, making it a total of 20 respondents and 15 respondents each from third and final-year classes of any department, making a total of 30 respondents. This equates to a total of fifty (50) respondents. In all, 150 respondents were involved in this research.

It is important to point out that the levels of respondents and numbers assigned to each level were done to have a balanced analysis of the impact of AI on the language and communication of the Nigerian undergraduates under study. While the respondents answered the questions in shared questionnaires, responses were gathered through an online platform called SurveyMonkey, which is user-friendly and allows for easy analyses of data. The data was analysed from the point of view of Albert Bandura's (1977) Social Learning Theory through observation. The study adopted content analysis and examined the patterns, themes and insights of the participants' responses, which helped to draw conclusions on the impact of AI on language and communication among the undergraduates.

5. Data Presentation and Analysis

The findings and results of the data collected are presented in the tables below as they reflect answers to the research questions and hypotheses.

Rating scale: SA - Strongly Agree =5
A- Agree =4
N- Neutral =3
D- Disagree =2
SD- Strongly Disagree =1

A mean value of 3.00 ascertained from the average of the five raters (i.e 5+4+3+2+1/5) was used as a benchmark for acceptance or rejection of any mean response. This means that any mean value of 3.00 and above was accepted and those of 2.99 and below were rejected. Also, a t-test was used to check the level of similarity of responses obtained from UNN and UNEC students at a 0.05 level of significance. This is to say that if the probability value of the two-tailed test is greater than 0.05, it means that the responses from both institutions are similar. However, if it is less than 0.05, it means that the students from the different institutions have varying responses.

Spreadsheet of Responses from Nigerian Students of UNN and UNEC

Table 1: Spreadsheet of responses from first-year students of UNN

	Communication Impact										Vocabulary and Grammar Impact									
UNN	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**	**Q8**	**Q9**	**Q10**	**Q11**	**Q12**	**Q13**	**Q14**	**Q15**	**Q16**	**Q17**	**Q18**	**Q19**	**Q20**
1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
2	5	5	4	5	4	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4
3	5	4	4	5	5	4	5	5	2	5	4	4	4	4	4	5	4	5	5	5
4	5	3	2	5	4	3	5	5	5	4	4	4	5	4	4	5	2	3	5	4
5	4	5	2	5	2	1	3	4	4	3	4	3	2	3	4	4	1	4	2	5
6	5	2	2	3	4	4	4	5	5	4	5	5	5	5	5	4	2	2	5	5
7	3	2	2	4	2	2	4	4	4	4	2	2	2	2	2	2	2	2	2	2
8	4	3	2	4	4	4	4	4	4	3	4	4	4	2	4	3	4	3	4	4
9	5	3	2	3	4	4	4	4	4	4	3	4	4	4	4	4	2	4	4	3
10	4	3	3	3	4	2	2	2	4	4	3	3	2	2	2	2	4	2	3	3
11	5	2	2	5	2	4	4	4	4	5	5	4	5	5	4	4	2	2	4	4
12	3	2	2	4	4	4	4	4	4	5	3	4	4	4	4	3	3	4	4	5
13	5	5	2	2	5	4	4	4	4	4	4	5	5	5	5	5	5	5	2	5
14	5	3	2	5	4	3	5	5	5	5	2	4	4	4	4	3	3	2	2	3
15	4	2	2	2	4	2	4	4	2	4	4	5	5	5	5	4	2	2	5	5
16	5	4	1	4	4	4	1	1	5	5	5	3	3	3	3	2	1	5	5	1
17	4	4	2	4	2	3	2	2	4	3	2	4	4	4	4	5	3	2	2	2
18	5	3	4	4	3	5	5	5	5	4	4	2	4	4	4	5	4	3	5	4
19	5	5	2	5	5	5	4	4	4	2	4	3	3	5	5	5	4	5	3	5
20	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Table 2: Spreadsheet of responses from second-year students of UNN

21	5	2	1	1	5	5	5	5	5	5	5	5	5	5	5	3	5	2	5	5
22	4	3	3	3	4	2	3	3	2	2	4	2	2	1	1	1	2	2	2	3
23	5	5	1	1	5	4	4	5	5	5	5	5	3	2	4	1	4	3	5	4
24	5	5	2	5	1	3	2	5	4	2	4	4	3	4	3	5	2	2	4	5
25	5	2	1	1	5	5	5	5	5	5	5	5	5	5	5	3	5	2	5	5
26	4	5	2	5	3	3	4	4	2	3	3	4	3	4	3	4	4	3	3	4
27	5	4	3	2	1	1	1	2	3	3	4	1	3	3	3	3	2	2	2	2
28	4	4	3	3	3	3	3	2	5	4	4	4	4	5	5	5	4	3	3	4
29	5	5	2	5	5	3	4	4	4	4	4	3	3	4	3	4	4	3	3	2
30	5	5	2	5	2	4	4	4	5	5	5	5	5	5	5	5	4	3	3	3
31	5	5	1	5	5	5	5	5	5	5	5	5	5	5	5	5	4	3	3	2
32	3	4	3	4	4	4	3	4	4	3	4	3	4	2	4	3	4	4	2	4

33	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1
34	5	3	2	5	3	3	4	5	4	2	3	3	5	4	2	4	3	4	4	3
35	3	5	2	4	4	2	4	4	5	2	3	3	4	4	4	3	2	2	4	4
36	4	2	3	4	4	4	5	5	5	2	5	5	2	2	3	4	2	3	4	5
37	4	5	4	4	4	4	5	3	5	2	3	3	3	3	4	3	3	5	5	2
38	3	2	2	4	4	2	4	4	4	2	4	4	4	4	4	4	4	4	4	4
39	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
40	4	4	2	4	2	2	2	2	4	5	3	4	4	4	4	4	2	3	4	4

Table 3: Spreadsheet of Responses from third-year students of UNN

41	5	2	2	1	4	3	3	5	1	1	5	3	3	4	4	4	2	1	1	1
42	1	1	3	3	4	4	4	4	4	4	4	3	3	4	4	4	4	4	5	5
43	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	2	5	5	5	5
44	2	4	4	5	2	4	5	5	4	2	5	4	4	5	5	2	4	4	4	4
45	5	1	1	1	3	5	4	5	5	5	5	5	5	5	5	3	5	5	5	5
46	5	3	2	4	2	2	2	3	4	2	2	2	4	3	4	2	2	3	4	4
47	5	5	5	5	5	3	4	2	4	4	3	3	3	2	2	2	2	2	3	2
48	5	4	2	3	3	4	4	3	3	2	4	2	4	3	2	3	4	2	2	2
49	5	3	2	5	3	1	3	4	3	2	5	5	3	5	5	5	2	2	2	4
50	4	4	3	3	4	1	3	3	4	4	3	2	2	3	2	1	2	2	4	3
51	5	4	3	3	3	3	4	4	2	5	4	3	5	5	5	2	5	5	5	5
52	4	4	3	4	5	4	4	4	5	4	5	5	5	4	4	3	3	3	3	2
53	5	5	2	5	4	3	3	4	3	3	3	2	2	3	3	4	2	2	3	4
54	5	5	4	3	2	3	3	3	2	5	5	4	4	3	3	2	3	4	4	4
55	5	5	2	2	4	3	5	5	3	5	5	4	4	4	2	5	2	3	4	3
56	5	5	1	3	4	3	4	4	4	3	3	4	2	4	1	2	2	3	3	3
57	4	2	2	5	4	3	3	3	3	3	5	5	4	4	3	3	2	4	4	4
58	4	4	3	3	3	1	3	1	5	4	5	5	5	5	5	1	5	4	4	4
59	4	2	1	3	2	3	1	3	2	2	3	3	2	3	2	5	2	3	3	3
60	4	3	2	1	3	4	2	4	4	1	4	3	2	3	2	2	3	2	2	2
61	3	3	1	5	4	3	2	3	3	2	4	2	3	2	3	3	2	3	2	3
62	2	2	2	2	2	2	3	3	2	2	3	2	2	1	3	2	2	2	4	2
63	3	3	3	3	2	2	2	3	3	2	3	2	3	3	2	3	3	2	2	2
64	5	5	5	5	5	5	5	5	5	5	5	5	1	5	5	5	5	5	5	1
65	5	4	4	3	3	2	1	4	2	2	3	2	3	3	2	2	2	2	2	2
66	3	2	4	4	3	3	3	5	5	5	4	4	4	4	4	4	4	4	4	4
67	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	5	4	4	3
68	3	1	3	1	4	3	4	4	4	3	4	3	3	3	3	3	2	4	2	3
69	5	5	5	5	5	2	2	3	4	2	4	2	2	3	1	2	3	2	3	2
70	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

Table 4: Spreadsheet of responses from final-year students of UNN

71	5	4	2	2	3	4	4	4	5	4	5	5	5	5	5	2	4	2	4	4
72	3	4	3	4	3	3	3	2	4	4	4	3	3	3	3	3	4	2	2	4
73	5	1	2	2	4	4	4	5	5	5	5	5	5	5	5	1	5	5	5	5
74	4	4	4	3	1	1	4	2	4	4	2	4	3	2	3	4	1	4	4	4
75	4	3	2	2	4	4	4	4	4	4	3	3	3	3	4	3	2	2	3	4
76	5	3	2	4	4	4	4	1	3	3	5	4	4	4	4	3	4	4	5	5
77	5	5	3	3	2	3	5	4	5	5	5	5	5	5	5	5	5	5	5	5
78	4	2	2	2	2	4	4	4	5	3	4	4	4	4	4	4	2	2	2	4
79	5	4	3	5	1	1	5	5	5	2	4	4	5	5	4	3	2	2	5	5
80	5	5	2	2	4	3	1	4	5	3	5	5	5	5	4	1	2	2	4	4
81	5	5	4	5	5	3	2	5	5	2	3	4	4	4	3	5	5	4	2	4
82	5	4	2	2	3	4	1	4	5	2	5	5	5	4	4	1	2	2	4	4
83	4	2	3	3	2	3	4	4	4	4	3	3	3	4	4	4	2	4	4	4
84	4	4	3	5	4	3	3	3	4	4	3	3	5	3	4	4	2	2	5	4
85	2	2	2	1	4	4	4	4	4	2	4	1	4	4	4	2	4	4	2	4
86	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	5	3
87	4	4	2	5	5	3	3	5	2	2	5	5	3	3	2	5	4	4	1	4
88	4	4	2	5	2	3	2	4	4	2	4	4	4	4	4	2	2	4	3	4
89	4	2	2	2	3	4	2	4	4	4	4	4	4	4	4	2	2	3	5	4
90	5	2	2	5	3	2	3	3	5	5	4	4	4	4	1	4	2	2	2	1
91	5	3	2	5	3	2	4	4	4	4	4	4	4	4	4	2	2	4	4	4
92	4	2	2	5	2	4	4	5	5	4	4	4	4	4	2	5	2	4	4	4
93	4	3	2	4	4	3	4	4	3	3	4	4	4	3	4	3	2	3	4	4
94	5	3	2	1	3	5	2	5	5	3	5	5	5	5	5	2	2	2	5	5
95	3	1	1	5	1	1	5	4	3	1	2	2	3	2	2	4	1	1	2	2
96	5	3	2	4	4	4	4	5	5	4	4	4	4	4	4	4	5	4	4	4
97	5	3	3	4	4	1	5	5	4	1	3	3	3	2	2	5	1	1	4	5
98	5	4	5	5	3	5	5	5	5	4	5	5	2	3	5	5	1	5	5	4
99	4	4	2	5	4	4	4	4	4	3	4	5	4	5	4	2	3	3	5	4
100	3	5	2	5	2	5	5	5	5	2	5	4	4	5	4	4	5	5	3	4

Table 5: Spreadsheet of responses from first-year UNEC students

UNEC																				
1	5	5	5	5	5	5	4	2	5	4	5	4	3	4	4	3	2	3	4	4
2	5	5	5	4	3	3	2	2	3	3	3	2	3	4	3	2	2	2	3	2
3	5	5	5	5	5	4	5	5	5	1	5	4	4	4	4	3	2	3	5	3
4	3	3	3	2	3	3	3	4	4	2	4	3	3	3	4	3	2	4	4	4
5	5	5	5	3	5	4	4	4	4	4	5	4	4	4	4	3	3	3	3	3
6	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
7	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

8	5	5	2	4	5	5	4	4	4	2	4	3	2	3	2	1	2	2	3	4
9	3	3	3	4	5	3	3	4	5	5	5	5	4	4	4	3	4	2	3	3
10	4	4	4	3	3	2	3	3	3	3	5	3	2	2	2	2	1	1	2	2

Table 6: Spreadsheet of responses from second-year UNEC Students

11	4	1	2	3	3	3	2	3	3	3	3	1	1	1	1	2	3	1	2	2
12	5	5	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
13	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5
14	2	2	2	2	2	5	2	4	1	1	1	1	1	1	1	1	1	1	1	1
15	5	3	2	3	3	3	3	3	3	3	3	3	3	5	3	5	3	3	3	4
16	4	3	1	2	3	4	4	4	2	2	5	3	2	1	3	4	3	2	2	2
17	3	3	3	2	2	2	2	2	2	1	5	5	3	3	2	3	3	1	2	3
18	3	3	1	4	4	2	2	2	2	3	3	2	2	5	2	2	2	2	2	2
19	3	4	4	3	2	2	2	2	2	3	3	2	2	3	3	2	3	3	2	3
20	5	4	3	3	4	2	3	2	3	3	2	5	4	4	3	2	3	4	4	2

Table 7: Spreadsheet of responses from third-year UNEC students

21	5	3	2	5	3	3	4	5	4	1	5	5	5	3	4	3	3	3	3	4
22	4	3	2	4	3	3	2	3	4	3	4	4	4	3	4	2	3	2	4	4
23	5	5	5	5	5	5	5	4	5	5	5	5	5	5	4	3	4	4	4	5
24	5	4	4	4	3	2	4	3	4	3	2	1	2	1	2	3	1	1	2	1
25	4	4	4	4	3	3	3	3	3	2	3	4	3	3	3	4	3	3	3	3
26	2	2	1	4	5	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1
27	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
28	4	5	4	4	5	4	4	5	5	2	5	5	5	4	5	5	4	4	5	5
29	5	3	2	5	3	4	3	3	3	3	4	4	4	3	3	3	2	2	4	4
30	4	2	2	4	2	3	4	4	2	4	3	3	3	3	3	2	2	3	3	3
31	2	4	2	5	3	1	3	2	3	1	4	4	3	4	2	5	3	2	2	3
32	3	5	2	4	4	4	5	4	4	1	4	5	2	3	3	5	1	2	3	5
33	3	4	3	4	4	4	3	3	3	4	3	3	4	4	4	4	3	3	3	3
34	4	2	4	4	4	4	4	4	4	2	3	4	3	3	5	3	4	4	4	4
35	5	4	2	5	2	4	4	4	4	1	2	2	4	2	2	4	3	2	2	2

Table 8: Spreadsheet of responses from final-year UNEC students

36	5	5	2	2	4	4	4	4	4	5	5	5	5	5	5	1	5	5	5	5
37	2	2	1	1	1	1	2	2	3	4	3	3	2	3	2	4	3	1	5	1
38	4	2	3	4	4	2	5	2	3	3	5	2	3	2	3	3	3	3	3	2
39	3	3	2	3	4	2	5	5	5	5	4	3	3	3	3	3	3	3	3	4
40	5	5	1	1	4	2	3	4	4	3	5	2	3	3	3	3	3	2	2	2
41	2	3	2	5	2	4	4	3	3	3	5	4	3	4	3	3	3	2	5	5
42	3	5	4	2	3	3	3	2	3	3	4	4	3	4	5	5	5	4	4	4

43	5	5	1	3	1	5	5	4	4	5	5	5	5	5	5	5	5	4	3
44	4	4	2	5	4	4	2	4	3	4	5	4	4	4	4	2	3	4	4	4
45	4	3	3	5	4	3	4	4	4	2	3	3	4	3	4	3	2	3	4	3
46	5	2	2	4	4	4	4	5	4	3	5	5	4	4	3	2	2	4	4	4
47	5	4	3	4	1	1	1	1	2	5	5	4	1	2	5	2	2	1	3	2
48	3	2	2	2	1	3	3	3	3	2	1	3	1	3	1	1	4	2	2	3
49	4	3	2	1	2	1	2	1	2	1	2	1	1	1	2	3	1	1	2	2
50	5	5	1	3	5	4	4	3	3	4	5	5	5	5	5	5	5	4	4	4

Research Question 1: How does artificial intelligence impact the online and face-to-face communication of Nigerian university students?

Table 9: Mean rating of the impact of artificial intelligence on the face-to-face and online communication of UNN students in **Tables 1, 2, 3 and 4.**

S/N	Item Statements	N	Mean	Decision
1.	AI has enhanced communication effectively.	100	4.25	Accepted
2.	I engage in face-to-face interactions with peers more frequently than communicating online.	100	3.47	Accepted
3.	AI has made my listening skills very poor.	100	2.54	Rejected
4.	It is easier to express emotions and feelings through face-to-face interactions compared to online.	100	3.62	Accepted
5.	I have experienced misunderstanding or misinterpretation in online communication.	100	3.41	Accepted
6.	AI has impacted the quality of my relationship with peers.	100	3.25	Accepted
7.	Using AI in communication might make people pay less attention to meaningful face-to-face interactions.	100	3.57	Accepted
8.	AI has made it easier to connect with students from diverse backgrounds.	100	3.96	Accepted
9.	AI has improved the accessibility of communication for students with disabilities.	100	4.10	Accepted
10.	I would prefer to use AI communication platforms over traditional face-to-face interactions in the future.	100	3.28	Accepted

Table 10: Mean rating and standard deviation of the impact of artificial intelligence on the face-to-face and online communication of UNEC students in Tables 5, 6, 7 and 8.

S/N	Item Statements	N	Mean	Decision
1.	AI has enhanced communication effectively.	50	4.02	Accepted
2.	I engage in face-to-face interactions with peers more frequently than communicating online.	50	3.76	Accepted
3.	AI has made my listening skills very poor.	50	2.82	Rejected
4.	It is easier to express emotions and feelings through face-to-face interactions compared to online.	50	3.60	Accepted
5.	I have experienced misunderstandings or misinterpretations in online communication.	50	3.44	Accepted
6.	AI has impacted the quality of my relationship with peers.	50	3.28	Accepted
7.	Using AI in communication might make people pay less attention to meaningful face-to-face interactions.	50	3.40	Accepted
8.	AI has made it easier to connect with students from diverse backgrounds.	50	3.34	Accepted
9.	AI has improved the accessibility of communication for students with disabilities	50	3.44	Accepted
10.	I would prefer to use AI communication platforms over traditional face-to-face interactions in the future.	50	3.00	Accepted

Tables 9 and **10** show the impact of artificial intelligence on the online and face-to-face communication of Nigerian undergraduates. The mean scores, apart from one, meet the 3.00 benchmark for acceptance of any item, which implies they are accepted, but the one below the 3.00 benchmark implies it is rejected. This result implies that item 3 is perceived by the respondents as the negative impact of artificial intelligence on online and face-to-face communication, while the remaining nine items (1,2,4,5,6,7,8,9 and 10) are perceived as the positive impact of AI on online and face-to-face communication. These positive impacts include effective enhancement of communication, quality relationships with peers, easy connection with students from diverse backgrounds and the improvement of accessible communication for students with disabilities, while the negative impact is poor listening skills. Even though AI can provide information and resources to students more efficiently and effectively than human teachers, it could be argued that it could improve listening skills. On the other hand, if students rely too heavily on AI for their learning, it could lead to them being less engaged and paying less attention when listening to teachers or other speakers.

However, the result also shows that students still value face-to-face interaction more than online communication, in that it helps them to express feelings and emotions easily. Meanwhile,

aside from the fact that they value face-to-face communication more than online, they still prefer to use AI communication platforms over face-to-face interactions in the future.

Table 11: Summary of t-test analysis on the impact of artificial intelligence on online and face-to-face communication, P<0.05

Institution	N	Mean	T	DF	Sig. (2-tailed)
UNEC	50	3.41	0.67	148	0.51
UNN	100	3.55			

The analysis in **Table 11** shows that the t-cal 0.67 is significant at 0.51, which is greater than the 0.05 level of significance. Therefore, the null hypothesis is not rejected. Thus, there was no significant difference in the mean ratings of UNEC. Also, UNN students had a similar level of response on the impact of artificial intelligence on face-to-face online communication.

Research Question 2: How does artificial intelligence impact the vocabulary and grammar used by Nigerian university students?

Table 12: Mean rating and standard deviation of the impact of artificial intelligence on vocabulary and grammar of UNN students in **Tables 1-4.**

S/N	Item statements	N	Mean	Decision
11.	The use of AI has improved my vocabulary.	100	4.05	Accepted
12.	AI has influenced my use of English grammar.	100	3.70	Accepted
13.	AI has impacted my knowledge of synonyms and antonyms.	100	3.67	Accepted
14.	The use of AI has helped me understand the distinction of language tone and context.	100	4.47	Accepted
15.	AI has significantly improved my reading skills.	100	3.58	Accepted
16.	Relying too much on AI might hinder vocabulary development.	100	3.22	Accepted
17.	AI has made me more likely to use slang and abbreviations.	100	3.05	Accepted
18.	AI has made me less likely to use emoji instead of words.	100	3.18	Accepted
19.	The use of AI in writing has made me more dependent on technology for English language vocabulary development.	100	3.58	Accepted
20.	AI has helped me improve my writing accuracy.	100	3.64	Accepted

Table 13: Mean rating and standard deviation of the impact of artificial intelligence on vocabulary and grammar of UNEC students in **Tables 5, 6, 7 and 8.**

S/N	Item statements	N	Mean	Decision
11.	The use of AI has improved my vocabulary.	50	4.00	Accepted
12.	AI has influenced my use of English grammar.	50	3.50	Accepted
13.	AI has impacted my knowledge of synonyms and antonyms.	50	3.22	Accepted
14.	The use of AI has helped me understand the distinction of language tone and context.	50	3.34	Accepted
15.	AI has significantly improved my reading skills.	50	3.30	Accepted
16.	Relying too much on AI might hinder vocabulary development.	50	3.10	Accepted
17.	AI has made me more likely to use slang and words.	50	3.14	Accepted
18.	AI has made me less likely to use emoji instead of words.	50	2.78	Rejected
19.	The use of AI in writing has made me more dependent on technology for English language development.	50	3.28	Accepted
20.	AI has helped me improve my writing accuracy.	50	3.22	Accepted

Tables 12 and **13** show the impact artificial intelligence has on the vocabulary and grammar of UNN and UNEC students. The mean scores, apart from one are above the 3.00 benchmark for acceptance of any item. Both UNN and UNEC students had a high perception of the AI's impact on their use of grammar and vocabulary. Meanwhile, some UNEC students still had a low perception of item 18 statements, showing that AI does not make them use words instead of emojis. The positive results imply that AI improves one's vocabulary, enhances one's grammar, impacts one's knowledge of synonyms and antonyms, helps one understand the distinction of language tone and context, and improves one's reading skills, among others. However, inasmuch as they value the usage of AI, they still perceive that relying too much on it might hinder vocabulary development and also, using it to write makes one more dependent on technology for English language vocabulary development. This shows that they do not want to rely only on AI but also use the traditional method of learning.

Table 14: Summary of t-test analysis on the impact of artificial intelligence on vocabulary and grammar. P<0.05

Institution	N	Mean	T	DF	Sig. (2. tailed)
UNEC	50	3.29	1.59	148	0.11
UNN	100	3.61			

The analysis in **Table 14** shows that the t-cal 1.59 is significant at 0.11, which is greater than the 0.05 level of significance. Therefore, the null hypothesis is not rejected. Thus, there was no significant difference in the mean ratings of UNEC and UNN students on the impact of artificial intelligence on vocabulary and grammar. This suggests that UNEC and UNN students had similar levels of responses on the impact of artificial intelligence on vocabulary and grammar.

5. Conclusion

This study set out to investigate the multifaceted impact of artificial intelligence (AI) on English language use and communication among Nigerian university undergraduates, with particular attention to students from the University of Nigeria, Nsukka (UNN) and the University of Nigeria, Enugu Campus (UNEC). Grounded in Albert Bandura's Social Learning Theory, the research methodologically employed both qualitative and quantitative analyses of data collected via structured questionnaires on a five-point scale.

From the data presentation and interpretation, it is evident that AI has a significant dual effect which are both beneficial and potentially detrimental on students' language use and communication patterns. In terms of communication, AI was shown to enhance interaction by facilitating more effective and inclusive online communication, fostering peer relationships, and enabling access to communication tools that benefit students with disabilities. However, overreliance on these technologies also poses risks, including a noticeable decline in listening skills and a preference for digital interactions over valuable face-to-face engagement, which plays a critical role in emotional expression and human connection.

On the linguistic front, AI demonstrated a strong positive influence on vocabulary acquisition, grammar proficiency, synonym and antonym recognition, tone identification, and reading comprehension. Nevertheless, the research also uncovered a concerning trend: students' growing dependence on AI tools for vocabulary development and written expression could impede organic language learning and reduce the incentive for traditional study and critical thinking.

The statistical analyses further reinforced these findings. The similarity in responses between UNN and UNEC students as shown by the non-significant t-test values indicates a consistent perception of AI's influence across diverse academic backgrounds and university settings. This suggests a broader trend in the Nigerian undergraduate population, where students appreciate the efficiency and accessibility of AI but are also mindful of the possible drawbacks tied to excessive reliance.

In conclusion, this study contributes valuable insights to the ongoing discourse on AI's role in education, particularly in the context of language and communication development. While AI can indeed revolutionise learning environments by providing personalised, efficient, and accessible tools, educational stakeholders must also encourage balanced usage. Emphasis should be placed on fostering digital literacy, critical thinking, and interpersonal communication

to ensure that students harness AI's potential without compromising essential human-centric learning experiences. As such, the integration of AI in language education should be both strategic and cautious, guided by pedagogical frameworks that prioritise holistic development.

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APPENDIX

Online survey Questionnaire: Language and Communication Implications of Artificial Intelligence on Selected Nigerian University Students.

Biodata

Age

- 18-25 years old
- 26-32 years old
- 32 years old and above

Gender

- Male
- Female

Marital Status

- Single
- Married

- Prefer not to say

Level of Study

- 100 Level
- 200 Level
- 300 Level
- 400 Level

. **University/Campus**

- UNN
- UNEC

Section 1: The Impact of AI on Nigerian University Students' Communication Both In-Person and Online.

1. AI has enhanced communication effectively.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree
2. I engage in face-to-face interactions with peers more frequently than communicating online.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree
3. AI has made my listening skills very poor.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree
4. It is easier to express emotions and feelings through face-to-face interactions compared to online.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree
5. I have experienced misunderstandings or misinterpretations in online communication using AI.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

6. AI has impacted the quality of my relationships with peers.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree
7. Using AI in communication might make people pay less attention to meaningful face-to-face interactions.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree
8. AI has made it easier to connect with students from diverse backgrounds.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree
9. AI has improved the accessibility of communication for students with disabilities.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree
10. I would prefer to use AI communication platforms over traditional face-to-face interactions in the future.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree

Section 2: AI's Impact on the Vocabulary and Grammar Used by Nigerian University Students.

11. The use of AI has improved my vocabulary.
    - Strongly Agree

- Agree
- Neutral
- Disagree
- Strongly Disagree

12. AI has influenced my use of English grammar.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
13. AI has impacted my knowledge of synonyms and antonyms.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
14. The use of AI has helped me understand the distinction of language tone and context.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
15. AI has significantly improved my reading skills.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree

16. Relying too much on AI might hinder vocabulary development.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
17. AI has made me more likely to use slang and abbreviations.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree

18. AI has made me less likely to use emoji instead of words.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
19. The use of AI in writing has made me more dependent on technology for English language vocabulary improvement.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
20. AI has helped me improve my writing accuracy.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree

Thank you for taking the time to complete this questionnaire. Your responses will provide crucial insights for this research project. Please contact me if you have any other questions or comments.