

IMPERATIVE OF USING ARTIFICIAL INTELLIGENCE TO FACILITATE LANGUAGE EDUCATION IN HIGHER EDUCATION INSTITUTIONS IN NIGERIA

Chaka J. G.

*Department of Computer Science, Federal University of Education, Pankshin
chakajohn@gmail.com*

ARTICLE INFO

Article No.: 028

Accepted Date: 15/07/2025

Published Date: 29/07/2025

Type: Research

ABSTRACT

Reliance on the traditional teaching and learning practices by most Higher Education Institutions in Nigeria, especially in the areas of language, arts and humanities, constitute an obstacle to the attainment of the objectives of the institutions. This practice is not only time consuming, slow in yielding desired results, but also very expensive as much money is required in buying learning resources. The emergence of artificial intelligence might have brought succor to both teachers and learners in this regard. Relying on the versatility and capability of AI therefore, this paper explores the use of AI in facilitating Language Education in Higher Education Institutions in Nigeria. The methodology that the paper adopts is the exploration of the literature. The unified theory of acceptance and use of technology (UTAUT) is used to underpin the study. The paper finds that AI can facilitate Language Education in the areas of speaking and reading, writing and grammatical constructions, and pedagogy. The paper also found some associated challenges to include AI biases, black box problem, legal concerns, negative perceptions, and tool for disinformation among others. The paper concludes that the adoption of AI in language education is one good decision that can reshape the future of the discipline and recommends among others, the need for guardrails to ensure the appropriate use and implementation of AI across the society, specifically in language education.

Key Words: Artificial Intelligence, Education, Language Education

Introduction

All over the world, Higher Education Institutions (HEIs) are in constant search for new/better ways of addressing challenges that seem to hinder the attainment of their mandates. The purpose is to facilitate pedagogical practices. Traditionally, teaching and learning only occurs within the four walls of the classroom where students meet with their teachers on a face to face basis. As the years pass by, most of the HEIs began to involve the use of technology to address/overcome prevailing challenges (Arvind & Atul, 2024). Some of the technological interventions in teaching and learning are described as Computer Aided Learning or Computer Assisted Learning (CAL), Technology Enhanced Learning (TEL), and Mobile Learning (ML) (Chaka & Govender, 2020). Today, the trending technology is Artificial intelligence (AI). From the two words that make up AI, the word ‘artificial’ means something that is non-natural or synthetic, while ‘intelligence’ refers to the deep capability to comprehend the surroundings (Kanade, 2022). Thus, Artificial Intelligence is simply a technology that creates machines, which mimic human intelligence (Jackson, Ekong, & George, 2024; Martinez, 2018).

Education, which is essential in human development, is the process of acquiring knowledge, skills, values, attitudes, and habits through teaching, learning, training, or research (Adesemowo & Sotonade, 2022). It helps individuals develop intellectually, socially, emotionally, and morally. One area of education that might be in dire need of the intervention of AI is Language Education. Language education is the process of teaching and learning a language, typically one that is not the learner's native language. The language can be a foreign or second language (Akase, n.d.). Language education involves the acquisition of skills including listening, speaking, reading, and writing skills. A language is not innate or inborn (Oludare & Olatunji, 2024). In other words, no one claims to be born of any language. Rather, every person has the tendency of acquiring a language. This suggests that language education is highly dependent on the sociolinguistic situation, which include the environment and the resources that are around it. The implication is that language education can be facilitated by availability of appropriate resources. However, the non-availability of an appropriate learning environment is one major challenge of language education (Oludare & Olatunji, 2024). An important characteristic of a learning environment is the learning resources (Chaka & Govender, 2020). For this reason, this paper seeks to address the challenge of inadequate learning environment and resources through the exploration of an AI facilitated environment for language education.

Statement of the Problem

Over reliance by HEIs in Nigeria on the traditional approaches in handling Language Education result in challenges that culminate into a poor learning environment and by extension inadequate learning resources. This challenge inhibits the institutions from attaining their mandates.

Objectives of the Study

This paper aims at achieving the following objectives:

1. Uncover the viability of AI in facilitating Language Education in HEIs in Nigeria
2. Provide awareness to Language Educators and students on the prospects of AI in Language Education.

Methodological Approach

The paper adopts an exploratory methodological approach. The approach harnesses the efficacy or usefulness and the viability of AI in language education from the literature. By implication, no primary data is involved or collected. Findings from the literature, which showcase the various ways in which AI can be used to facilitate Language Education are then brought bare. These findings not only signal the efficacy of AI in Language Education, but serve as a guide on the ways of application of AI in Language Education.

Theoretical Framework

A theory is an established framework that can be used to explain the various variables that surrounds a situation or phenomenon and the interrelationship between them. Creswell (2014) highlights that a theory may be used in a study either in the form of an argument, a discussion, or rationale to explain a phenomena that is occurring. One theory that is considered to be relevant to this paper is the Unified Theory of Acceptance and Use of Technology (UTAU). The theory, which was developed by Venkatesh et al., (2003) is used to explain the behaviour of people towards the acceptance and use of an Information System/technology. This theory posits that the intention to use a new system/technology is directly influenced by three key variables (Performance Expectancy, Effort Expectancy, and Social Influence) while the fourth variable – facilitating conditions directly influence the use of the technology itself. The theory further indicates that four other factors - gender, age, experience, and voluntariness of use moderate the impact of the four independent variables. The UTAUT framework is presented in Figure 1.

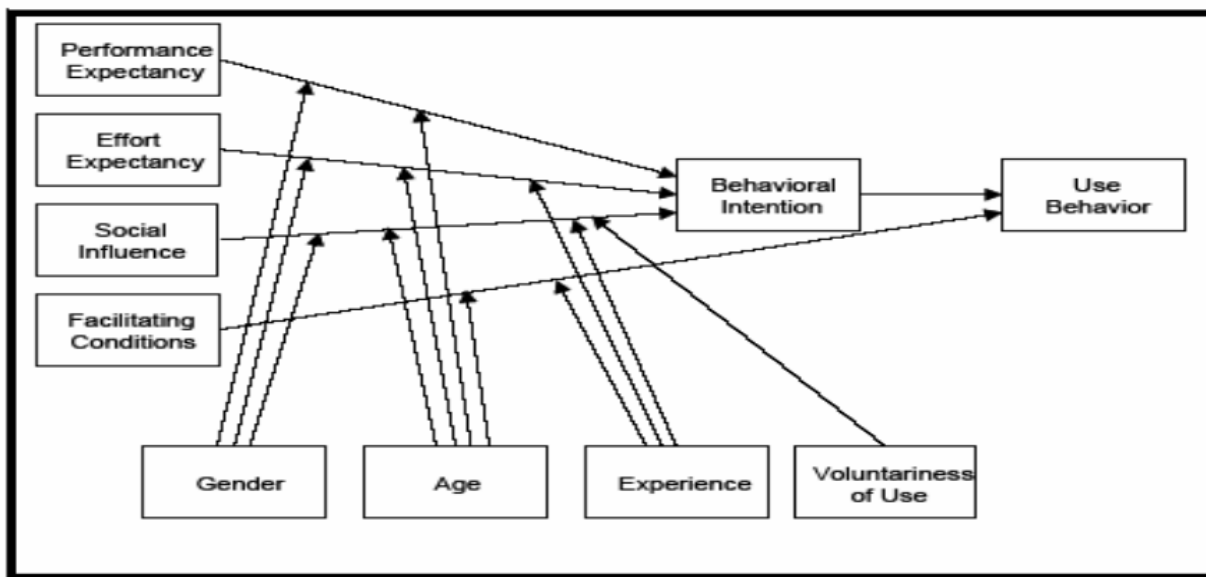


Fig.1: Unified theory of acceptance and use of technology (Venkatesh, Morris, B, & Davis, 2003, p. 447)

The theory further explain the various independent constructs as follows:

Performance expectancy measures the degree to which, users belief that the technology will be helpful in their job. In other words, users will be willing to use the technology if they feel that the technology will help them perform their job better.

Effort expectancy measures the degree to which, users belief that the technology will be easy to use. Users will have positive intention to use the technology if they belief that they can operate it easily.

Social influence measures the degree to which other important people influence the intention of users to use the technology. The important others can be superiors, peer groups etc.

Facilitating conditions refers to the degree to which, users belief that the working environment has facilities to support the use of the technology.

Since this paper encourages the use of AI to facilitate language education, this theory is considered useful as the intention of teachers and students to adopt it may depend on the four variables – performance expectancy, effort expectancy, social influence and facilitating conditions.

Artificial Intelligence – Components and How it Works

AI is the capability of an artificial object to handle complex problems using its induced intelligence (Amita, 2024). Simply put, AI is the ability to make computing devices reason like humans (Kanade, 2022). While humans have the capacity to reason on their own and then take decisions based on their reasoning, AI devices simply take decisions by learning from data. For this reason, algorithms are considered as the brain of AI, data is the fuel that drives AI, while computing power is regarded as the machine behind AI as can be seen in figure 2 (World Travel & Tourism Council, 2024).

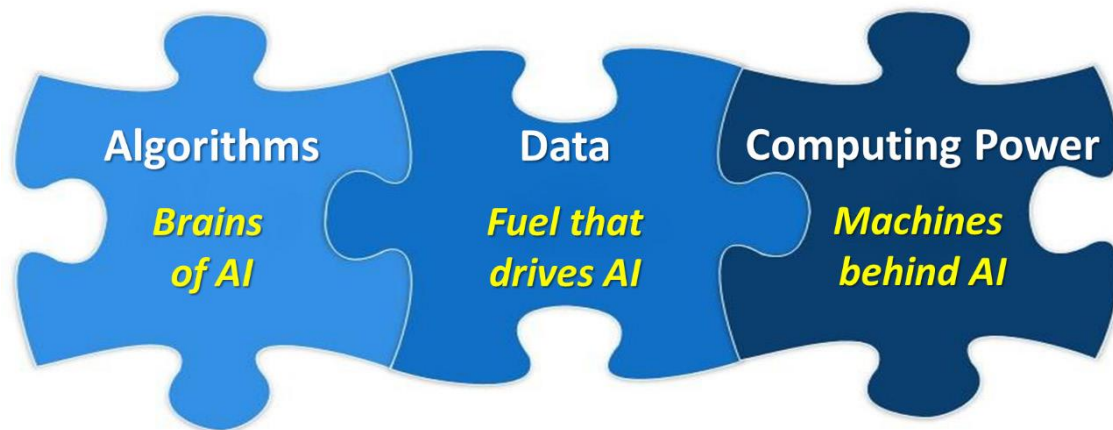


Fig. 2: Description of AI - Algorithms tell computers what to do. Data tells computers what to learn. Computing power gives machines the power to learn and make decisions (World Travel & Tourism Council, 2024, p. 8).

Like the computer itself, AI is very versatile in nature. The application of AI cuts across many disciplines including automobiles, medicine, agriculture, commerce, transportation, education, etc. (Chen, 2022; Sukubu & Atteng, 2023). Although many may think that AI is entirely a new technology, research (Zawacki-Richter, Marín, Bond, & Gouverneur, 2019) has shown that AI is

as old as the advent of computing itself. This is because the computer is an artificially intelligent device. The application of AI has only been escalated significantly in recent times. Thus, like many other industries, AI has been viewed to have the capacity to revolutionize the field of education (Chan & Colloton, 2024).

This study seeks to address one question – what is the efficacy of using AI to facilitate language education in HEIs in Nigeria.

Components of Artificial Intelligence

As mentioned earlier, artificial intelligence generally refers to induced intelligence, which is embedded in machines. Thus, the field of AI cuts across different technologies or forms, which include machine learning, natural language processing, computer vision, and so on. In line with this, Kanade (2022) categorizes and illustrates the various components of AI as shown in figure 3 below:

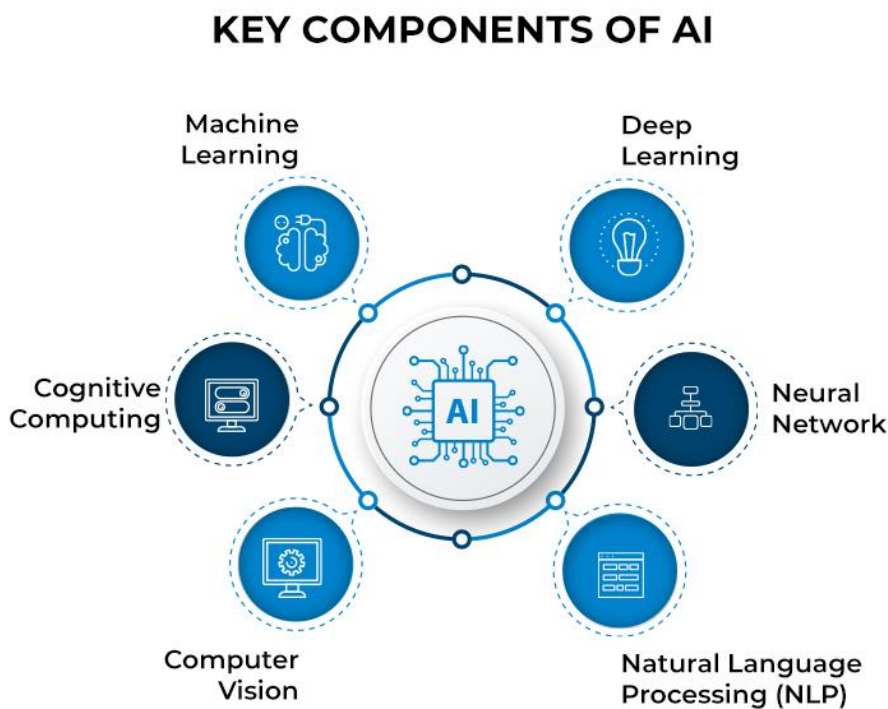


Fig. 3: Key components of AI (Konade, 2022, p.4)

Kanade (2022, p.5) provides a description of the various AI components as follows:

1. **Machine learning:** Machine learning is an AI application that automatically learns and improves from previous sets of experiences without the requirement for explicit programming.
2. **Deep learning:** Deep learning is a subset of ML that learns by processing data with the help of artificial neural networks.
3. **Neural network:** Neural networks are computer systems that are loosely modeled on neural connections in the human brain and enable deep learning.

4. **Cognitive computing:** Cognitive computing aims to recreate the human thought process in a computer model. It seeks to imitate and improve the interaction between humans and machines by understanding human language and the meaning of images.
5. **Natural language processing (NLP):** NLP is a tool that allows computers to comprehend, recognize, interpret, and produce human language and speech.
6. **Computer vision:** Computer vision employs deep learning and pattern identification to interpret image content (graphs, tables, PDF pictures, and videos).

While Konade (2022) refers to the listed items above as components of artificial intelligence, others for example (Sukubu & Atteng, 2023) see them as types of artificial intelligence. However, whether we refer to the different categories as types or components of AI, one thing that is common is the fact that AI exist in these different forms. This makes AI versatile or very useful in different areas of human endeavor, including language Education. For this reason, this paper highlights the application of AI in facilitating Language Education in Nigerian Higher Education Institutions.

How AI works

Before highlighting the application of AI in facilitating language Education, it is important to first of all understand how AI works. As mentioned earlier, the origin of AI is almost as old as the existence of the computer itself. Just as the computer accepts data, processing it and then provide results as output, so also is AI. Artificial Intelligence is a system, which relies on data as input. The input data can be in form of text, images, speech etc. The input data is then processed based on predefined rules or algorithms to provide, interpret, or predict results. After processing, the AI system generates an outcome, which can either be a success or a failure. The report is then assessed through a sort of analysis, discovery and feedback mechanism, which is again used by the system to adjust the source data, algorithm and target outcomes until the desired results are obtained (Kanade, 2022).

The summary of how an AI system works can be represented pictorially as shown in figure 4.

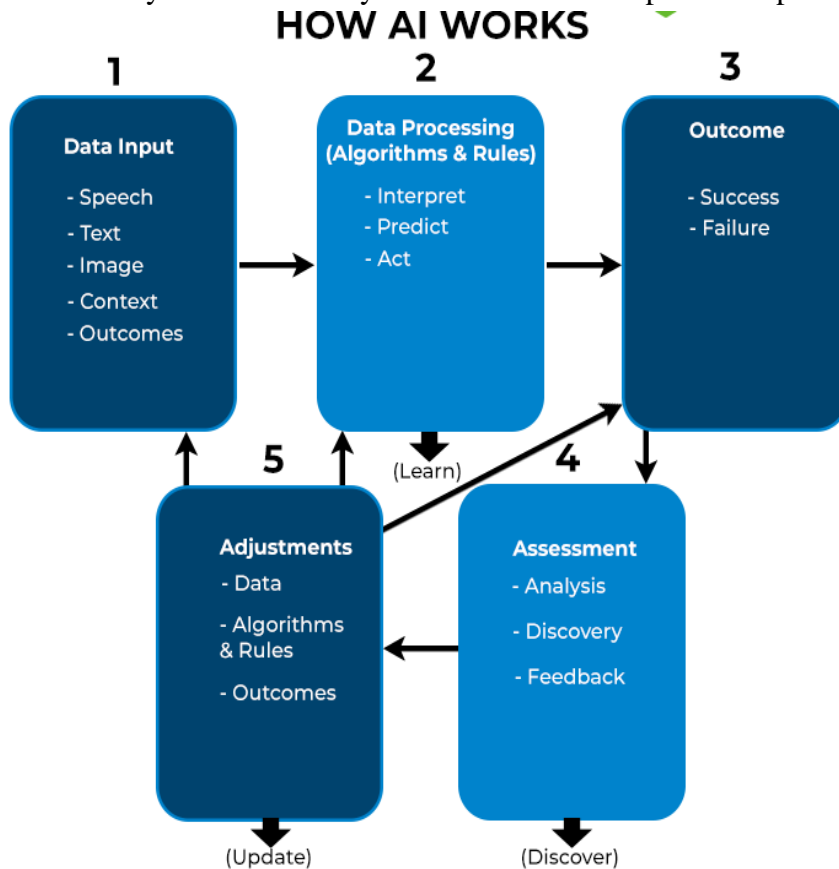


Fig. 4: How an AI system works (Konade, 2022, p.3).

Concepts of Education and Language Education

Education is considered to be a valuable asset in the entire process of human development. Bamisaiye (1989, p. 9) puts it that education is “a cumulative process of development of intellectual abilities, skills and attitudes, all of which form our various outlooks and dispositions to action in life generally”. In other words, education in general may not be limited to the four walls of a room or a formal setting. It is a lifelong process, which is expected to mold the social behavior of a person. On the other hand, formal education is a form of education that is well planned and structured (Adesemowo & Sotonade, 2022). It takes place in designated environments called schools. For example, primary school. Secondary school, tertiary (Universities, Colleges of Education, Polytechnics etc.).

A language is the means through which communication is made possible (Spolsky & Hult, 2008). It is the foundation for human communication and the means through which human beings and even artificial objects such as computing devices interact. A language occupies a central role in human life because it is the major means through which, thoughts, feelings, and ideas can be shared. It assists man in his expressions as well as dealing with his environment (Oludare & Olatunji, 2024). As was mentioned in the introductory part of the paper, Language Education refers to the acquisition of a language. It is concerned with how a language is learned and the

pedagogical approaches that are associated with language acquisition (Spolsky & Hult, 2008). The four major skills that are associated with Language Education include listening, speaking, reading and writing (Holden & Mickey, 1998). Language Education also involves the entire process of planning and implementing a curriculum that aims at impacting language skills (Amadi, 2014). In other words, language education involves all arrangements that create a conducive environment for language learning and acquisition.

Application of AI in Facilitating Language Education

Before considering the application of AI in facilitating language education, it is imperative to emphasize that the main objective of AI is to put in place a technology that enables computers to work not only intelligently, but also independently (Kanade, 2022). In other words, a technology that reads, understands and replicate human behaviors. In terms of language education, the most relevant components of AI are the Natural Language Processing (NLP), Automatic Marking and Feedback System, Adaptive Educational System, and Intelligent Tutoring System (Yang & Kyun, 2022; Son, Ružić, & Philpott, 2023). The emergence of AI has resulted in a shift from the traditional Computer Assisted Language Learning to an Intelligent Computer Assisted Language Learning. The new system is associated with big data processing and machine learning algorithms (Yang & Kyun, 2022), which to a large extent promotes students-computer interactions. The resultant benefit of the new trend include reduced time wastage, quick assessment with spontaneous feedback, and the ability to predict learner's feature performances (Pokrivčáková, 2019). Another application of AI in language education is its role in facilitating reading and comprehension skills (Crompton, Edmett, & Ichaporia, 2023).

Other relevant applications of AI in Language Education are discussed as follows:

1. **Speaking, Reading, Writing & Pedagogy:** AI is being used in teaching English Language in the areas of speaking and reading to improve pronunciation skills (Kazu & Kuvvetli, 2023); writing through interactions with neural machines to improve vocabulary, grammatical constructions and language translations (Dizon & Gayed, 2021; Lo, 2023); pedagogy as a conversational partner or a language coach by employing multiple ways to present information such as text, images, videos, learner generated context, having instructions tailored to the needs, patterns and learning pace of each student etc (Lee, Kim, & Sung, 2023); and self-regulation by engaging students in active thinking thereby helping them to manage their emotions and behaviours, which in turn affect or influence the choices and actions that they take. In addition, Chatbots can be used to help students set up their goals (Hew, Huang, Du, & Jia, 2023).
2. **NLP:** allows a natural language (source language) to be automatically converted into a target language. Language processors help educators determine how different textual aspects influence learners in terms of better text selection and construction at various phases of learning.
3. **Automated Writing Evaluation:** provides students with the opportunity of having feedback on their written work. It also enables students to gain valuable information on the types of errors that they encounter.

4. **Computerized Dynamic Assessors:** provides automatic mediations to learners allowing them to analyse language related issues. It provides corrective feedback, which allows students to work on their errors (Kamrood & Davoudi, 2021).
5. **Intelligent Tutoring Systems:** computerized systems meant to provide personalized and interactive instructions to learners without human interventions. They support first language learners effectively through translations.
6. **Automatic Speech Recognition:** AI technology that is capable of producing text from voice. Applications that perform this role include intelligent personal assistants (IPAs) Automatic Transcribers, Notetaking Apps etc. (Evers & Chen, 2022).
7. **ChatBot:** software applications that interact with users in the form of chats. In line with their functionality, chatbots are also known as dialogue systems, conversational agents etc. It operates in the form of questions and answer sessions thereby stimulating human conversations (Kim, Kim, & Cha, 2021). Some tools that can be used as chatbots include Large Language Models (LLMs), Machine Translators (MTs), Digital Writing Assistants (DWAs), Automated Paraphrasing Tools (APTs), and Chat Generative Pre-trained Transformers (ChatGPT) (Naidu & Sevnarayan, 2023).

Challenges Associated with the Use of Generative AI in HEIS in Nigeria

There are always two sides of a coin. Like in all aspects of human endeavor, there are challenges associated with every technology. While it is true that the application of AI, specifically GenAI may be revolutionizing all industries, particularly the education industry (Maphoto, et al., 2024), its integration especially in developing countries such as Nigeria, might not be without challenges.

Some of the challenges are highlighted below:

1. **AI Algorithm Bias:** AI operations rely mainly on pre trained data. This implies that the quality of its outcome highly depends on the quality and integrity of the data. Some of the biases can be racial, gender, communal or ethnic in nature (Konade, 2022).
2. **Black box problem:** like in the case of a black box, where the content is not known from the outside, so also are AI algorithms. Most people only obtain results from an AI system, but they have little or no knowledge of how the results have come about. Thus, they are at the mercy of what comes out.
3. **Poor understanding of implementation strategies:** as the application of AI spreads into different industries, its implementation strategies in such a manner that is harmless to the ethics of the various industries remains unclear.
4. **Legal concerns:** AI systems rely on data collection from various sources. Collection of sensitive data without due process might attract legal issues if found to violate existing laws.
5. **Absence of defined roadmap/strategic plan:** AI seems to be making its way drastically into the educational space (Pokrivčáková, 2019), including that of Nigeria. However, there

seems to be no clear road map, guidelines or strategic plan to guide the use or application of AI in Nigerian HEIs.

6. **People's Perception:** The integration of technology often come with some changes/adjustments in the manner in which things were hitherto done. It is common knowledge that change does not come without reactions or challenges (AlAli & Wardat, 2024). Depending on the people that are involved, some of the reactions that come with change can be positive (embracing the change), while others are negative (resisting the change) (Naidu & Sevnarayan, 2023). In addition, there may be mixed reactions by stakeholders due to fears of promoting bad practices such as plagiarism (Naidu & Sevnarayan, 2023). Other negative perceptions may be associated with the non-affordability, non-availability, and inadequate access to supporting hardware technology. More specific to language education, is the feeling that the development of AI may replace the teaching/learning language in the nearest future.
7. **Tool for Disinformation:** one other challenge of AI is that it could be used as tool for disinformation. A number of high quality photorealistic – but fake exist on the Internet. For example, fake pictures of the Pope wearing a puffer jacket, and that of the former US president, Donald Trump, being arrested had been generated using AI (World Travel & Tourism Council, 2024).
8. **Technology Breakdown:** poor or loss of connectivity can result in hitches such as wrong answers (Crompton, Edmett, & Ichaporia, 2023).

Conclusion

The study aimed at addressing the reliance on the traditional teaching and learning practices by most Higher Education Institutions in Nigeria, especially in the areas of language, arts and humanities, which has constituted an obstacle to the attainment of the objectives of the institutions. Specifically, the practice has resulted in poor access to an adequate learning environment including learning resources for language education. This paper, following the review of the literature uncovered various ways through which, AI can facilitate language education thereby reducing prevailing challenges. Although prospects of AI in facilitating language were established, other challenges that are associated with the use of the technology were highlighted and useful suggestions towards addressing them have been proffered. Thus, despite concerns and limitations, the use of AI in facilitating teaching and learning in general and language education to be specific, is gaining more popularity and becoming inevitable. Language teachers and students are therefore admonished to take advantage of the situation to facilitate their teaching and learning experiences. It is therefore imperative for stakeholders in language education to take advantage of this development. It is worthy of note that the application of AI in language education like with other technologies may not be fully free from concerns. For this reason, the unified theory of acceptance and use of technology has been used as an anchor to guide in determining the various factors that might affect the intention of stakeholders in adopting and using AI in facilitating language education in HEIs in Nigeria.

Recommendations

1. There is need for a guardrails to ensure the appropriate use and implementation of AI across the society, specifically language.
2. There should be a deliberate attempt to equip language teachers training and tools that will encourage them to embrace the use of technology, especially artificial intelligence in their teaching practices.
3. There is the need for continuous improvement in teachers' and students' digital literacy. Especially AI literacy to address issues such as transparency, trust, and surveillance and privacy. This will help language teachers and students to be more aware of the limitations and risks that are associated with AI

REFERENCES

- Adesemowo, P. O., & Sotonade, O. A. (2022). The Meaning and Scope of Education. In P. O. Adesemowo, *Basic of Education*. Ogun.
- Akase, T. T. (n.d.). Language Education in Nigeria: Problems and Prospects. *Journal of Teacher Perspective*, 1-7.
- AlAli, R., & Wardat, Y. (2024). Opportunities and Challenges of Integrating Generative Artificial Intelligence in Education. *International Journal of Religion*, 5(7), 784-793.
- Amadi, M. O. (2014). The Role of Language Education in Bridging the Gap in Education. *Knowledge Review*, 31(2), 1-5.
- Amita, P. (2024). Research Paper on Artificial Intelligence & it's Types. *International Journal for Research Trends and Innovation*, 9(10), 202-206.
- Arvind, S., & Atul, S. (2024). Revolutionary Applications of Generative AI in Higher Education Institutes. *Library Philosophy and Practice*, 1-9.
- Bamisaiye, R. (1989). *A Practical Approach to Philosophy of Education*. Ibadan: AMD Publishers.
- Chaka, J. G., & Govender, I. (2017). Staff Acceptance of Mobile Learning: The Case of Colleges of Education in Nigeria. *Journal for New Generation Sciences*, 15(1), 224-242.
- Chaka, J. G., & Govender, I. (2020). Implementation of Mobile Learning Using a Social Networking Platform: Facebook. *Problems of Education in the 21st Century*, 78(1), 24-47.
- Chan, C. K., & Colloton, T. (2024). *Generative AI in Higher Education: the ChatGPT Effect*. London and New York: Routledge Taylor and Francis Group.
- Chen, P. (2022). Design And Construction of an Interactive Intelligent Learning System for English Learners in Higher Education Institutions. *Advances In Multimedia*. doi:https://Doi.Org/10.1155/2022/6364796
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative and mixed methods approaches*. (3rd ed.). USA: SAGE Publications Inc.
- Crompton, H., Edmett, A., & Ichaporia, N. (2023). *Artificial Intelligence and English Language Teaching: A sytematic Literature Review*. London: British Council.
- Dizon, G., & Gayed, J. M. (2021). Examining the impact of Grammarly on the quality of mobile L2 writing. *JALT CALL Journal*, 17(2), 74-92.
- Evers, K., & Chen, S. (2022). Effects of an automatic speech recognition system with peer feedback on pronunciation instruction for adults. *Computer Assisted Language Learning*, 35(8), 1869–1889.
- Hew, K. F., Huang, W., Du, J., & Jia, C. (2023). Using chatbots to support pupil goal setting and social presence in fully online activities: Learner engagement and perceptions. *Journal of Computing in Higher Education*, 5, 40-65.
- Holden, S., & Mickey, R. (1998). *English language teaching*. Mexico City: DELTI.
- Jackson, E. O., Ekong, M. O., & George, W. K. (2024). Advancing Digital Literacy in Nigerian TVET: Leveraging Generative AIAs Enabling Technology. *Internatonal Journal of Educaton and Evaluaton*, 10(4). Retrieved 11 28, 2014, from www.iiardjournals.org Online Version
- Kamrood, A. M., & Davoudi, M. G. (2021). Diagnosing L2 learners' development through online computerized dynamic assessment. *Computer Assisted Language Learning*, 34(7), 868–897.
- Kanade, V. (2022, March 14). *What Is Artificial Intelligence (AI)? Definition, Types, Goals, Challenges, and Trends in 2022*.

- Kazu, I. Y., & Kuvvetli, M. (2023). The influence of pronunciation education via artificial intelligence technology on vocabulary acquisition in learning English. *International Journal of Psychology and Educational Studies*, 10(3), 480-493.
- Kim, H. S., Kim, N. Y., & Cha, Y. (2021). Is it beneficial to use AI chatbots to improve learners' speaking performance? *The Journal of Asia TEFL*, 18(1), 61–178.
- Lee, D., Kim, H. H., & Sung, S. H. (2023). Development research on an AI English learning support system to facilitate learner-generated-context-based learning. *Educational Technology Research and Development*, 71, 629-666.
- Lo, S. (2023). Neural machine translation in EFL classrooms: Learners' vocabulary improvement, immediate vocabulary retention and delayed vocabulary retention. *Computer Assisted Language Learning*.
- Maphoto, K. B., Sevnarayan, K., Mohale, N. E., Suliman, Z., Ntsopi, T. J., & Mokoena, D. (2024). Advancing Students' Academic Excellence in Distance Education: Exploring the Potential of Generative AI Integration to Improve Academic Writing Skills. *Open Praxis*, 16(2), 142-159. doi:<https://doi.org/10.55982/openpraxis.16.2.649>
- Martinez, R. (2018). Artificial intelligence: Distinguishing between types & definitions. *Nevada Law Journal*, 19(9).
- Naidu, K., & Sevnarayan, K. (2023). ChatGPT: An ever-increasing encroachment of artificial intelligence in online assessment in distance education. *Online Journal of Communication and Media Technologies*, 3(1). doi:<https://doi.org/10.30935/ojcm/13291>
- Oludare, B. A., & Olatunji, O. A. (2024). NIGERIAN LANGUAGES IN EDUCATION AND GLOBALISATION. *Rima International Journal of Education*, 3(1), 218–228.
- Pokrivčáková, S. (2019). Preparing teachers for the application of AI-powered technologies in foreign. *Journal of Language and Cultural Education*, 7(3), 135-153.
- Rockwell, A. (2018). *The history of artificial intelligence*. Retrieved from <https://sitn.hms.harvard.edu/flash/2017/history-artificial>
- Son, J., Ružić, N. K., & Philpott, A. (2023). Artificial intelligence technologies and applications for language learning and teaching. *J. China Comput. Assist. Lang. Learn*, 1-19.
- Spolsky, B., & Hult, F. M. (2008). *Handbook of educational linguistics*. Malden, MA: Blackwell.
- Sukubu, T. A., & Atteng, C. J. (2023). Artificial Intelligence (AI), Curriculum, and Special Needs Education in Nigeria. *Rivers State University Faculty of Education Conference Journal*, 3(1), 1-15.
- Venkatesh, V., Morris, M. G., B, D. G., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27(3), 425-478.
- World Travel & Tourism Council. (2024). *Introduction to Artificial Intelligence (AI) Technology: Guide for Travel and Tourism Leaders*. United Kingdom: World Travel and Tourism Council.
- Yang, H., & Kyun, S. (2022). The current research trend of artificial intelligence in language. *Australasian Journal of Educational Technology*, 38(5), 180-210.
- Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education: Where are the educators? *International Journal of Educational Technology in Higher Education*, 19(1). doi:<https://doi.org/10.1186/s41239-019-0171-0>.