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A Global Perspective on Artificial Intelligence in Language Teaching and Learning

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ARTICLE INFO	ABSTRAK
Volume: ISSN: **KATAKUNCI** Artificial Intelligence (AI), Global Perspective, Language Learning, Language Teaching.	The utilisation of Artificial Intelligence (AI) has emerged as a crucial element in various fields owing to its ability to mimic human cognitive functions performed by machines, specifically computer systems. The aforementioned characteristic highlights the increasing importance of artificial intelligence in several industries. The present research discussion explores the practical application of artificial intelligence in the domain of language instruction and acquisition. The focus of the present research is to examine the utilisation of artificial intelligence (AI) in the field of language education, with a specific emphasis on its application in language acquisition. The present article employs a qualitative research technique, specifically focusing on content analysis, to investigate the body of literature obtained from relevant databases. The findings of the study reveal the emergence of nine key themes related to the application of Artificial Intelligence in the domain of language teaching and learning. The application of artificial intelligence in educational environments demonstrates its capacity to enhance language instruction and acquisition.

1. Introduction

In order to enhance the quality of education, educational practitioners need to align themselves with global standards by continuously adapting to advancements in technology (Santiana, et al., 2021; Santiana and Marzuki, 2022). Artificial Intelligence (AI) is a system that, over time, will progressively blend seamlessly into various human tasks, fading from view as users acclimate to the other technologies integrated into their everyday routines. As a result, human dependence on AI may become routine. Artificial Intelligence (AI) is a type of computational creativity that has heightened interest in the development of artificial intelligence (AI) technology (Cheng and Day, 2014). Many artificial intelligence technologies have been deployed to help machines gain creativity. One of the functions that AI can play is the process of teaching and learning a language enabling students to accelerate their study of a specific language (Kite-Powell J., 2017). Learners can learn a language through repeated sentence structures that reveal the links between words. More precisely, it assists the learners in improving their speaking skills, particularly their pronunciation and listening abilities. Artificial intelligence (AI) designs software that sifts through knowledge and performs distinct functions independently, such as computation or student queries (Ali, 2020; Kannan and Munday, 2018). AI constructs "intelligent" devices that operate and respond in manners akin to human cognitive processes, encompassing computer systems (online platforms) and automated devices (robots) (Karsenti, 2019).

Moreover, AI is referred to as Machine Intelligence, as noted by Mehrotra (2019). The envisioned intelligence within machines mirrors the innate cognitive abilities exhibited by humans. AI denotes the infusion of human-like intelligence into machinery to carry out designated tasks. Mehrotra (2019) defines Artificial Intelligence (AI) as a field within computer science that explores the examination and advancement of intelligent devices and applications. It entails the discipline of imbuing machines with the ability to reason and act akin to a human of discerning intellect. AI technology's fundamental underpinning lies in its intelligence manifestation (Wang, 2019). On the other hand, characterizes AI as the exploration of intelligent behaviours across humans, animals, and robots, aiming to uncover avenues for their enhancement (Aljohani, 2021).

2. Literature Review

AI doesn't necessarily entail crafting an exceedingly intelligent computer capable of solving every problem; instead, it involves constructing a machine capable of mimicking human actions (Pokrivcakova, 2019). The essence of artificial intelligence revolves around creating computer software or hardware systems that exhibit human-like thinking or showcase attributes traditionally linked with human intellect (Campesato, 2020; Dwivedi, et al., 2021). As a theory in computer systems, AI is competent in executing tasks typically associated with human intelligence. Components of the human intellect,

such as speech comprehension, language understanding, decision-making, and visual perception, can be comprehended by artificial intelligence. The demand for AI arises to establish expert systems and devise solutions for intricate challenges like recognition and natural language processing (Alam, 2021; Sarker, et al., 2021). AI can function as a language tutor, offering tireless and tailored instruction, and furnishing learners with ample feedback and support activities required to attain fluency, all within a low-pressure setting (where learners are more inclined to experiment and learn from mistakes). A notable commitment to AI lies in its potential to expedite skill development.

With the advancement of technology and digital platforms, teaching and learning English has also grown easier (Santiana and Fatimah, 2017; Santiana, et al., 2022). These now provide an opportunity to strengthen one's English language skills. This suggests that if we have a machine teaching English, we may not need English teachers or English education (Haleem, et al, 2022). As a result, the Fourth Revolution does not have to replace English instruction. Instead, constructing an English class model based on Artificial Intelligence should be done in tandem with the English teaching and learning process. Language literacy and digital literacy are excellent combos for increasing global competency. In any case, this paper aims to investigate the application of AI in educational settings for foreign language study. AI is a technology that every educator ought to be familiar with in this Fourth Industrial Revolution when technology is significantly incorporated into teaching and learning. This is because AI is a technology that can teach itself. In the case of AI, it would appear that the presence of a teacher and the acquisition of a language are not required, even though a computer is competent to handle the workload of a class (Felix, 2020). Its usage enables education to become more student-centred, which leads to the learner's empowerment.

3. Methodology
The methodologies utilised in the present article review are elucidated in these sections. They delve into the research design encompassing the selection of research articles for sampling, the methods for collecting data, and the procedures for analysing data. This comprehensive approach is instrumental in synthesising the review of reports seamlessly.

3.1 Design of the Study
Following this, the design of qualitative research to investigate a single research issue, content analysis, is used and presented in this study. As elucidated by Fraenkel et al. (2019), content analysis entails the scrutiny of diverse written materials, including but not limited to textbooks, essays, newspapers, novels, magazine articles, cookbooks, music, political speeches, and advertisements, as well as images. Consequently, the focus of this article review centres on research papers, with the researcher skilfully synthesizing relevant content from these sources to address the focal subject. This methodological approach ensures a comprehensive examination of the topic's nuances and contributes to a more nuanced understanding of the subject matter. The ensuing sections will delve into the specific steps and processes involved in implementing content analysis within the framework of this study.

3.2 Selected Research Articles
The research articles compiled to examine the applications of AI in English teaching and learning, specifically detailed in the 'Findings' section, are sourced from established databases: Scopus, Web of Science, Science Direct, PubMed, and Elsevier. The stringent eligibility criteria inform this choice, as these databases are deemed more reliable than internet search engines like Google or Yahoo. Furthermore, the integrity of the papers hosted in these databases is more assured. Additionally, only research articles published within the preceding five (5) years were chosen as the sample materials for this review. This selection criterion is motivated by the necessity to exclusively consider recent research outcomes before exploring AI's applications in language education.

3.3 Procedures for Collecting Data
Four (4) phases are followed in acquiring data for the current investigation. The first step is to find acceptable databases, with Scopus, Web of Science, Science Direct, PubMed, and Elsevier chosen to collect resources. The second step is to scout pertinent articles and picks publications on the use of artificial intelligence in language teaching and learning. Furthermore, only full-paper items are considered for examination. Step three involves data synthesis. To get the content of the material written by researchers, articles are read, grasped, and inferred. Finally, in step four, themes are developed in order to select important and fascinating data (Maguire, 2017). The articles that have been created are used to discuss the findings that follow the research question that was formed at the beginning of this review paper. The findings of the chosen publications' analysis provide useful insights into the research subject and contribute to the field's existing body of knowledge. These findings are thoroughly examined, emphasizing their significance and implications for future study and practice. Furthermore, the study's shortcomings are acknowledged, and suggestions for future research to improve our understanding of language acquisition and learning are made.

3.4 Techniques for Analysing Data

The papers are examined in five (5) stages (Fraenkel, et al., 2019). First, *the unit of analysis must be specified*, in which the researchers choose phrases, words, and sentences to insert into the database in order to find elements that are connected to one another. A phrase, word, or sentence can be typed into a thesaurus to get synonyms and explanations for the term or phrase. Second, there is a procedure called *Locate Relevant Data*, which locates current research papers by locating relevant data from online databases. The third stage is known as *Developing a Concept or Rationale*. This is the stage at which the researchers will engage in tasks such as skimming, scanning, analysing, and synthesising as they read the articles and their individual themes. Fourth, in Step 4, *Construct a model of the strategy*, Step 3 is integrated with Step 4, in which the researchers employ random sampling to discover relevant material before skimming, scanning, analysing, and synthesising the selected articles. The researchers try to immerse themselves in this step; ideally, the researcher is attentive and highly observant, devoting adequate time to painstakingly assess the data presented in the selected publications. Fifth, *Formulate Coding Category* occurs when the researcher integrates the study papers, she is reading with the process of creating codes and categories. This is known as memoing, and it requires researchers to summarise the content of the research articles.

4. Results and Discussion

In summary, the review aims to uncover insights into the utilization of AI in the realm of language instruction and acquisition. Five distinct themes emerge in connection with the initial research query presented at the outset of the review. These thematic categories include:

4.1 Artificial Intelligence Can Be Combined with Flipped Classroom for Effective Learning

A flipped learning technique is integrated into the application of artificial intelligence in the research that was done for learning English (Li and Peng, 2022). To be more specific, AI and flipped learning combine in blended classes, and the result of this combination is several beneficial impacts that accrue during the process of language acquisition. It was shown that students had a higher level of self-efficacy and were more optimistic about their ability to learn English. This is the case where the students who were selected for the experimental group had higher levels of confidence in their public speaking abilities than the students who were assigned to the control group. In a similar vein, when it came to their listening ability, the students in the experimental group did significantly better than those in the control group. In conclusion, it was discovered that students' extrinsic drive was stronger than their intrinsic motivation in the sense that the former component, namely the determination to gain incentives, drove students to learn English more than the motivation derived from simply participating in the listening or speaking activity. To put it another way, the students' levels of extrinsic motivation were higher than their levels of intrinsic motivation.

4.2 Artificial Intelligence Boosts English Teaching Efficiency and Effectiveness

An investigation into the applications of AI revealed that the technology has the potential to improve both the teaching and learning of English (Chen, et al., 2022). It assists practitioners in the various teaching-related activities they engage in, including translation. According to the findings of the study, English practitioners who make use of AI enhance listening activities and better prepare students for an environment of communication similar to that experienced by native speakers. It indicated that using the tool could indirectly improve one's reading and writing abilities, which are the other two language skills. According to the findings of the research, integrating AI into English classroom activities enables students to connect and push the limits of their own learning. It may foster positive development among practitioners who are striving to teach the language.

4.3 Applications of Artificial Intelligence Use in Writing Instruction

The utilisation of artificial intelligence (AI) in the realm of writing instruction and learning has emerged as a significant area of interest and research (Shaikh, et al., 2022). AI applications in this context encompass a range of technologies and techniques that aim to enhance the teaching and learning of writing skills. The utilisation of artificial intelligence (AI) possesses the capacity to revolutionise the field of reading teaching, hence enhancing the effectiveness of literacy education. The system conducts an analysis of textual material, discerns recurring trends, and customises information to suit individual preferences.

AI-powered solutions offer feedback, thereby improving understanding, vocabulary, and fluency, as well as strengthening cognitive capacities and critical thinking capabilities.

4.4 Applications of Artificial Intelligence Use in Reading Instruction

The utilisation of artificial intelligence (AI) has the potential to greatly enhance literacy education through its capacity to evaluate textual material, identify patterns, and tailor content delivery (Ouyang, et al., 2022). Artificial intelligence (AI)-driven solutions provide prompt feedback on comprehension, vocabulary learning, and fluency, thereby augmenting cognitive talents and fostering critical thinking skills.

4.5 Applications of Artificial Intelligence Use in Vocabulary and Grammar Learning

Artificial Intelligence (AI) has the potential to augment language development through the provision of individualised teaching aimed at facilitating vocabulary and grammar learning. AI-driven language learning platforms include a range of interactive exercises, quizzes, and games that are customised to suit the unique talents of each learner. These platforms offer rapid feedback and the capability to monitor and assess progress over time. Artificial intelligence (AI) has the capability to detect prevalent errors and intricate linguistic patterns, hence facilitating specific interventions and concentrated exercises. AI-driven chatbots and virtual language instructors effectively include learners in interactive conversational exercises, thereby augmenting their proficiency in the practical application of recently acquired vocabulary and grammar principles.

4.6 Applications of Artificial Intelligence in Learning to Speak and Listen

AI has revolutionized language learning by enhancing speaking and listening skills. Speech recognition technologies provide immediate feedback on pronunciation and intonation, replicating genuine conversation scenarios. Language learning platforms offer interactive listening exercises, exposing learners to various accents, dialects, and speech patterns. This approach not only provides individualized and immersive learning experiences but also enhances communicative abilities crucial in practical language application. The ongoing progress of AI presents a significant opportunity to revolutionize language education by making it more interactive, captivating, and efficient.

4.7 Artificial Intelligence Offering Individualised Learning Experiences

AI is being utilised to deliver personalised learning experiences that adapt to individual learners' unique requirements and preferences. This advancement goes beyond traditional methods, since AI systems analyse data to obtain insights into learners' strengths, shortcomings, and progress patterns. This data is utilised to develop personalised learning paths, courses, and activities that encourage personal involvement and active engagement in educational advancement.

Furthermore, the ability of artificial intelligence to provide immediate feedback improves the learning process. AI systems enable learners to receive rapid comments and suggestions, allowing them to remedy errors in real-time and improve their skills through iterative refinement. This includes tasks like reviewing language exercises, analysing pronunciation, and evaluating comprehension. The aforementioned environment, which is distinguished by its responsiveness and interaction, fosters a dynamic learning environment that encourages the development of self-directed learning habits and fosters a sense of accomplishment.

The advancement of AI technology reveals the potential for further enhancement of personalization in the field of education. The potential impact of integrating artificial intelligence (AI) with education is significant, as it can transform conventional learning approaches and cultivate self-directed learners who possess the necessary skills to succeed in a progressively intricate and interdependent global society.

4.8 Artificial Intelligence Accepted by Teachers and Students

The acceptance of AI by both teachers and students is observed. The observation of AI's acceptance within the educational context is evident as both educators and learners recognise the tangible advantages and transformative possibilities it offers. Educators value the capacity of artificial intelligence (AI) to automate administrative tasks, which allows them to allocate more attention to personalised instruction and foster student engagement. The incorporation of artificial intelligence (AI)-enabled tools in the process of lesson planning, content generation, and assessment facilitates a more efficient workflow for educators, allowing them to allocate additional time towards engaging interactions and inventive pedagogical approaches.

Similarly, students enthusiastically adopt artificial intelligence (AI) as they observe its profound influence on their educational trajectory. The utilisation of artificial intelligence (AI) in providing tailored recommendations and immediate feedback contributes to the improvement of comprehension and skill development. Incorporating AI-driven interactive content and

gamified learning experiences introduces a stimulating component to their educational endeavours. The favourable engagement with technology not only enhances their comprehension but also provides them with essential digital competencies that are imperative in contemporary society.

The integration of AI into the educational domain represents a notable transition towards more dynamic and efficacious approaches to teaching and learning. The potential synergy between educators and learners, along with the seamless incorporation of artificial intelligence, holds the prospect of moulding a future in which education becomes not only more effective but also more captivating and influential.

4.9 Artificial Intelligence Allows Students to Make Immediate Adjustments

The phenomenon of AI adoption is evident among both educators and students. The recognition of AI's acceptance within the educational setting is apparent, as educators and learners alike acknowledge its tangible benefits and potential for transformation. Educators place a high level of importance on the ability of artificial intelligence (AI) to automate administrative tasks, as this enables them to dedicate additional focus to personalised instruction and the cultivation of student engagement. The integration of AI-enabled tools in the various stages of lesson planning, content creation, and assessment offers educators a more streamlined workflow, enabling them to dedicate more time to interactive and innovative pedagogical methods.

In a similar vein, students eagerly embrace the use of artificial intelligence (AI) as they witness its significant impact on their educational journey. The integration of artificial intelligence (AI) in the provision of personalised recommendations and prompt feedback contributes to the enhancement of comprehension and the advancement of skill acquisition. The integration of artificial intelligence (AI)-powered interactive content and gamified learning experiences introduces a stimulating element to individuals' educational pursuits. Positive interaction with technology not only improves individuals' understanding but also equips them with crucial digital skills that are essential in today's society.

The incorporation of artificial intelligence (AI) within the realm of education signifies a significant shift towards more dynamic and effective methodologies for both instruction and knowledge acquisition. The potential collaboration between educators and learners, combined with the seamless integration of artificial intelligence, presents the possibility of shaping a future in which education becomes not only more efficient but also more engaging and impactful.

5. Conclusion

The objective of this current examination is to uncover the applications of AI within language instruction and acquisition. The analysis demonstrates that AI serves as a tool for comprehending natural human speech, facilitating the implementation of a flipped learning approach for language education, enhancing learners' competency and productivity, and enabling the assessment of spoken language. Collectively, these findings underscore AI's significant role in language teaching and learning, underscoring its manifold advantages.

These insights hold particular relevance for educators aiming to incorporate AI into their instructional strategies. However, it's important to acknowledge that this study has limitations. Specifically, it lacks comprehensive insight into the utilisation of AI in other language skills, such as reading and writing, as the focus of the reviewed articles pertains primarily to speaking and listening applications. In light of this, a subsequent investigation could delve into the implementations of AI in these two additional language skills, contributing to a more comprehensive understanding of its overall impact on language education. Such an expanded analysis would undoubtedly provide educators with a more holistic view of the potential benefits that AI offers in the broader context of language teaching and learning.

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