Using AI for developing best practices in foreign language learning: A review study.

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Abstract. The integration of Artificial Intelligence (AI) in foreign language learning has significantly transformed educational practices by offering personalized learning experiences, adaptive feedback, and interactive engagement. This study systematically reviews AI-driven best practices in foreign language education, identifying strategies that enhance language acquisition. Following PRISMA guidelines, a comprehensive analysis of 14 empirical studies from Web of Science and Scopus was conducted. The findings highlight AI's role in providing tailored learning paths, real-time feedback, and interactive conversational simulations, contributing to improved motivation and engagement. However, challenges, such as limited contextual awareness, ethical concerns, and the need for teacher training persist. The study concludes that AI should be integrated as a complementary tool rather than a replacement for traditional teaching methods, ensuring a balanced approach that maximizes its benefits while addressing its limitations. Future research should focus on long-term impacts and strategies for effective AI-human collaboration in language education.

Keywords. AI, foreign language education, best practices, review.

1. Introduction

The increasing importance and adoption of AI technology in education highlighted how AI may transform language acquisition by offering individualized and flexible learning opportunities. Studying English as a foreign language has altered as a result of strategies including using AI chatbots for interactive practice, providing immediate feedback, and customizing lessons to each student's needs [1,2]. Engaging activities to sustain student motivation and the use of data-driven insights to inform instruction are both crucial components of today's educational process [3, 4].

Emphasizing language learning best practices are quite successful when it comes to using AI in language learning [5, 6]. By matching content to each learner's current ability level and learning style, personalized learning guarantees that students make progress and retain more information [7, 8, 9]. The role of instant feedback is crucial in this process. Automated feedback helps students quickly see and fix errors in writing, grammar, and pronunciation, resulting in more effective learning [10, 11].

AI chatbots that mimic real-world interactions provide relevant speaking and listening practice, which is essential for language learning [12]. Teachers can tailor their instruction to meet the needs of each individual student by analyzing performance data, which enhances overall results [13]. Learning becomes more pleasurable when students are engaged and involved in the process through engaging and interactive activities [14]. Having materials available in a variety of languages and formats guarantees that all students can use and gain from language learning resources, irrespective of their needs or preferred method of learning. By combining the best practices in a learning environment, a thorough and successful method of language learning might be developed,

optimizing the advantages of AI technology [1].

In addition, the theoretical landscape is being drastically altered by the incorporation of AI into best practices for language instruction. By customizing content and feedback tailored to the needs of each student, AI makes personalized learning experiences possible, which is consistent with constructivist views that support learner-centered approaches [15]. Given its alignment with constructivist principles of learner-centeredness, active learning, and learner agency, AI holds the potential to revolutionize language instruction [16]. Additionally, AI-powered tools boost student motivation and engagement through gamified learning and interactive simulations, which reflects the significance of motivation in theories of language acquisition [17]. Vygotsky's Zone of Proximal Development (ZPD) is supported by AI's instantaneous, continuous input, which provides timely direction [18, 19]. The difference between what a student can accomplish on their alone and what they can accomplish with assistance or teamwork is known as the ZPD [20]. Good teaching focuses on this area, offering the ideal amount of support and challenge to promote learning. AI is a potent tool for assisting students inside their ZPD because of its capacity to deliver constant and immediate feedback. According to Vygotsky [20], AI can function as a "knowledgeable other" by adjusting task complexity in real-time, providing tailored clues and explanations, and adjusting to a learner's present level [15]. The ideals of evidence-based teaching techniques are further reinforced by AI's capacity to evaluate large data sets, which helps educators make decisions based on solid evidence [21]. By encouraging peer engagement, AI-enabled collaborative learning environments lend credence to social constructivist views in relation to cooperation and personalized learning [22]. In addition, the focus on digital literacy and digital competence in AI-integrated language instruction equips students and teachers to use digital tools critically and navigate them, which is an essential component of contemporary language instruction [23].

AI applications can significantly assist educators and learners in creating appropriate and successful language learning strategies [24 - 26]. Through the analysis of enormous volumes of data from many learners and educational environments, it may produce best practices in language learning [1, 6]. It can discover what works best for certain learner types by identifying patterns and trends in effective learning tactics [9]. AI can adjust and improve these procedures to maintain their efficacy by regularly evaluating student performance and feedback [27, 22]. Furthermore, teachers can experiment and find the most effective strategies by using AI to simulate different teaching approaches and learning settings. The total effectiveness of language acquisition is increased by this data-driven, iterative process, which aids in the development and application of best practices that are scalable and customized. Examining best practices through AI is essential because it facilitates the ongoing improvement of teaching methodologies, which results in more efficient and scalable language acquisition techniques, and it allows for individualized, data-driven insights that improve educational outcomes. By adjusting training to meet the needs of each individual learner, this method eventually increases the efficacy and efficiency of learning.

One notable gap in literature is that there might not be many thorough assessments that concentrate exclusively on AI best practices in the educational setting. Even if there are a lot of research studies and publications discussing different facets of AI in education, there is not a comprehensive analysis that methodically examines and compiles best practices. In order to give educators precise, fact-based implementation guidance, this gap emphasizes the necessity of a comprehensive analysis and documenting of successful AI-driven best practices or strategies. In addition to providing insightful information, filling this gap would help create more effective and scalable AI-based learning programs. Therefore, the aim of this study is to examine Best Practices used in AI-driven foreign language education. The research question is then as follows: How can AI be integrated in foreign language learning to create best practices?

2. Methodology

This research adhered to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure a comprehensive and systematic approach in identifying and analyzing relevant studies on the use of AI for developing best practices in foreign language learning.

2.1 Data Sources and Search Strategy

The To gather relevant literature, we conducted a thorough search of two major academic databases: Web of Science and Scopus. These databases were chosen for their extensive coverage of high-quality, peer-reviewed research articles and conference proceedings. The search was performed using the following search string: **(AI OR "Artificial Intelligence") AND ("best practice" OR "best practices") AND (language OR languages)**

This search strategy was designed to capture a wide range of studies that explore the intersection of artificial intelligence, best practices, and language learning. The initial search yielded a total of 235 studies.

2.2 Inclusion and Exclusion Criteria

To ensure the relevance and quality of the studies included in our analysis, we applied specific inclusion and exclusion criteria:

Inclusion Criteria:

- Studies written in English
- Published as journal articles or conference proceedings
- Experimental and empirical studies that provide data-driven insights

Exclusion Criteria:

- Studies published in languages other than English
- Grey literature, such as reports, theses, and dissertations
- Review studies and other non-empirical research
- Books and book chapters
- Studies published before 2020

These criteria were established to focus on recent, high-quality research that directly contributes to the understanding of AI applications in language learning.

2.3 Screening and Selection Process

The initial pool of 235 studies underwent a rigorous screening process. Each study was reviewed by the researchers to assess its relevance and adherence to the inclusion and exclusion criteria. This screening process involved multiple stages:

1. Title and Abstract Screening: The titles and abstracts of all 235 studies were reviewed to identify potentially relevant studies. Studies that did not meet the inclusion criteria were excluded at this stage.
2. Full-Text Review: The full texts of the remaining studies were then examined in detail to ensure they met all the inclusion criteria. Studies that did not provide empirical data or were not published in English were excluded.
3. Final Selection: After the full-text review, 14 studies were found to fully comply with the inclusion and exclusion criteria. These studies were selected for detailed analysis.

2.4 Data Extraction and Analysis

The selected studies were subjected to a thorough analysis to extract relevant data on the use of AI in developing best practices for foreign language learning. Key information such as study design, AI techniques used, outcomes, and implications for language learning were systematically extracted and synthesized. This approach ensured that the final selection of studies provided robust and comprehensive insights into the research topic.

3. Results

Altogether, there were 14 articles. The articles include: Aijun, 2024 [7]; Alharbi, 2024 [35]; Alier et al., 2024 [31]; Alshaikhi and Khasawneh, 2024 [27]; AlTwijri and Musaed Alghizzi, 2024 [34]; Cogo et al., 2024 [32]; Karataş et al., 2024 [30]; Klimova et al., 2024 [25]; Leung et al., 2023 [28]; Li et al., 2023 [26]; Polakova and Klimova, 2024 [4]; Van den Berg and Du Plessis, 2023 [33]; Venter et al., 2024 [11]; Yunhua and Budiman, 2024 [29].

The topics of the articles include personalized learning experiences, simulating real conversations, flexibility and accessibility, cultural immersion, role of teachers, exercise correction, and motivation and engagement. The methodologies of the detected articles were based on a mixed-methods approach that combined both quantitative and qualitative data collection techniques, providing a more comprehensive analysis by integrating numerical data with rich, contextual information.

The findings of the identified articles indicate that AI has created a personalized game based on language learning, especially for individuals without programming skills [26]. According to Aijun [7], this system can identify learners' strengths and weaknesses in semantics, pragmatics, vocabulary and grammar, adjusting the learning content according to each student's unique needs and abilities, creating a highly personalized learning path. Karataş et al. [30] add that it facilitates research, saving students time. Some tools aid the individual learning process, such as a text generator for reading or learning vocabulary, with the option of specifying certain words. Thus, students practice reading comprehension and expand their vocabulary [26]; they break down sentences and explain the meaning of words and parts of speech [26]; they provide feedback on writing, suggesting improvements in organization and making arguments more convincing [31], introducing different grammatical structures and word lists [30]; they provide targeted vocabulary learning with examples and practice questions, differentiating between nuances of words and explaining expressions used in different contexts, expanding the user's vocabulary [26]; they provide targeted vocabulary learning with examples and practice questions, differentiating the nuances between words and explaining expressions used in different contexts, expanding the user's vocabulary [26].

As Alshaikhi and Khasawneh [27] noted, with these feedback systems, assessment instruments and real-time communication tools, foreign language teaching becomes more interactive. Students often prefer to talk to a human being, a native speaker or watch a video [4], but unfortunately, such communication becomes unfeasible. The existence of a web application that uses an instant messaging

interface to promote interactive exchanges between students and AI, simulating a conversational environment, can meet most of this need [11]. It is an opportunity to practice language skills outside the classroom, as a complement to traditional language learning methods [4]. ChatGPT is accessible to all, in an easy-to-use conversational format, and makes information available from various sources, offering concise answers [26]. Through mobile devices, such as smartphones and tablets, students can access all kinds of foreign language learning resources, and use them in their own way, in their own time and wherever possible [7], helping them to become more autonomous, with inclusive and accessible content, meeting individual needs [32]. It offers an opportunity to engage in cultural and creative learning experiences [30], and can make students feel as if they are in the native environment of the target language, enhancing their understanding of the cultural connotations behind the language and thus participating in social activities [7].

ChatGPT introduces teachers to new perspectives and inspires creativity by offering a range of potential activities and approaches to teaching a given topic [33]; thus, according to Alier et al. [31], it facilitates discussions on diversity and inclusion, and, according to Cogo et al. [32], it offers teachers support, such as lesson design, test creation, assistance with content creation, as well as feedback and evaluation, all based on examples from previous studies [31]. ChatGPT can create an acceptable basic lesson plan, with guidelines for the time to be spent on each stage, adaptable to meet the needs and context of teachers and students [33]; or teachers can submit their lesson plans to ChatGPT to request feedback on issues, such as quality and effectiveness in order to assess whether the lesson plan is effective [33]. By automating these processes, teachers can free up valuable time to focus on more personalized instruction and student support, improving the teacher-student relationship [32], confirming Alshaikhi and Khasawneh's [27] claim that AI methods facilitate and improve language learning.

The detailed structure of the feedback generated by AI, highlighting strengths before suggesting improvements, contributes to continuous improvement [11]. It designs targeted remediation exercises according to the types and frequencies of errors and difficulties learners experience when completing tasks [7]. ChatGPT excels at providing answers about languages, including vocabulary, grammar and culture [26]. It invites students to reflect on their answers and specify the areas in which they seek help [11]. Students are satisfied with the use of ChatGPT, as it offers many benefits to university students [25]. AI tools boost students' confidence and help improve areas of weakness [27]. By building an attractive task system, trackable learning objectives are set, and inspiring feedback is given in a timely manner to increase students' sense of achievement and engagement [7]. LLM consistently generated feedback responses that supported a positive learning environment, including affirmative phrases to motivate students to continue studying [11]. The use of such chatbots resulted in improved academic performance, increased motivation and engagement, reduced anxiety and increased attention and collaboration from all those involved in the educational environment [34].

The limitations reveal that the shortage of educators qualified in AI is detrimental to foreign language teaching [26]. It is clear that the teachers mentioned need training to use AI effectively. As Alharbi [35] noted, they feel they are lagging behind students, who are adopting these tools at a significantly faster rate than teachers in their educational practices. One of the roles of educators is to monitor students' development. Unfortunately, AI reduces interpersonal interaction between teachers and students [7], and cannot replace the value of human interaction, an essential factor for students' social and emotional development, as Alier et al. [31] point out, since it is unable to fully understand and satisfy students' psychological needs, emotional state and diverse learning strategies [7]. To improve this situation, continuous training should be provided to teachers. Integrating AI literacy into the curriculum, especially in EAP/ESP courses, is essential to bridge the gaps left between materials and the relationship between teachers and students [35]. According to Aijun [7], knowing how to use technological tools does not cancel out other available forms of teaching and learning. Teachers must be careful and create limits when using AI, as its excessive use can lead to students' dependence on technology, which prevents them from carrying out activities on their own if necessary. In addition, creativity and critical thinking can be impaired [31]. According to Klimova et al. [25], students did not admit to being unethical when using ChatGPT, which raises questions about academic honesty and the authenticity of students' work [31]. Regarding security, Aijun [7] indicates that there is a gap in protecting students' personal information, their privacy rights and preventing data from being illegally obtained, abused or leaked, as ChatGPT conversations are included in datasets to train future models [31]. There are concerns about the accuracy of the information produced by AI models [32]. The quality of the answers depends on the application domain; the ability of users to formulate questions effectively is crucial to obtaining accurate and relevant answers [31]. There are cases where AI has provided false references and a lack of visual images, a tool that would aid students' visual and tactile learning styles [25]. Therefore, the defects and errors of the technology itself can become a potential source of misinformation, leading students to misunderstand linguistic knowledge [7, 23]. AI systems in foreign language teaching are limited by the lack of

contextual perception [27]. Non-verbal clues, such as gestures, facial expressions and body language play a significant role in language development and the acquisition of communication [27]. There are also contextual factors, such as situational awareness, idioms and cultural complexity [27], as well as the ability to understand irony, hidden meanings and humorous terms. However, AI systems are unable to translate figurative language [27]. They also fail to understand and accurately convey cultural nuances and colloquial idioms [27]. Since AI algorithms are primarily made for text-based interactions, it is challenging to be sensitive to figurative contexts; they only understand literal matters [27].

The strengths of the findings from the detected studies include geographical and cultural diversity, as there are articles from Turkey, South Africa, Saudi Arabia, China, the United States, among others. This demonstrates how AI is used in different parts of the world and shows that many teachers are embracing the use of this technology in the classroom, both in the creation of materials and in teaching practice. In addition, students also use AI as a learning tool. It can be seen that the students selected have a self-taught profile, which positively boosts their studies, since they are not limited to the content they are given, but seek knowledge on their own. Another positive point is that all the data was taken from real experiences, which strengthens the validity of the findings. In addition, the theoretical basis of the articles was well selected, presenting only information pertinent to the topic covered.

The weaknesses of the findings from the detected studies are related to the study participants themselves. Some articles were conducted with teachers, others with students, and each of them belongs to different niches of study. Therefore, any information provided by the participants cannot be generalized, as it is specific to each group analyzed. In addition, the participants have different knowledge backgrounds, which may or may not influence the results of the research. Another negative aspect is the lack of detailed information about the participants. Although the authors correctly followed the ethical guidelines for disclosing data, they did not provide enough information to accurately identify the profiles of the people involved in the studies. In addition, the methods for analyzing the results were inaccurate, as they did not detail the methodology step by step, instead focusing directly on the results.

4. Discussion

The results confirm many of the claims presented in the introduction regarding the benefits of AI in foreign language learning. AI-driven tools provide personalized learning experiences by adapting to individual students' needs and abilities [7, 9]. This is in line with previous research highlighting the effectiveness of AI in creating customized educational pathways [1]. Moreover, AI tools facilitate interactive and engaging language practice, supporting the notion that sustained motivation is a key factor in successful learning [3, 4]. The capacity of AI to offer immediate feedback and performance analysis also reinforces the introduction's emphasis on data-driven insights enhancing instruction [10, 11].

However, the results highlight some discrepancies between expectations and real-world applications. While AI provides flexible and accessible learning opportunities [26, 32], studies reveal that many students still prefer human interaction for language learning [4]. Additionally, AI's inability to fully grasp cultural nuances and non-verbal cues challenges its effectiveness in developing advanced communication skills [27]. These findings suggest that AI should complement rather than replace traditional language learning methods.

Based on the findings, several best practices can be established for integrating AI in foreign language learning:

- Personalized learning paths – AI tools should adapt to individual learners by analyzing their strengths and weaknesses, thereby tailoring exercises to their specific needs [7, 26].
- AI chatbots for conversational practice – Virtual assistants that simulate real-world interactions can enhance speaking and listening skills, providing an effective supplement to human conversation [11, 4].
- Immediate and targeted feedback – AI should be employed to provide instant feedback on writing, pronunciation, and grammar, ensuring students can quickly correct mistakes and improve their skills [31, 11].
- Interactive and engaging exercises – The use of gamification, adaptive learning systems, and interactive AI-driven activities can help maintain motivation and engagement [30, 7].
- Cultural and contextual learning enhancements – AI should be integrated with multimedia content, such as videos and real-world dialogues, to support contextual learning and cultural immersion [7, 30].
- Teacher support and AI-assisted lesson planning – AI should be used as a tool to assist teachers in creating lesson plans, assessing student progress, and generating customized exercises [33, 32].

While this study provides valuable insights into the role of AI in foreign language learning, it has several limitations. The analysis of the findings was time limited. Most studies focused on short-term results, and there is limited evidence on the long-term impact of AI-driven language learning. And since the research on Best Practices in AI-driven foreign language environment is still in its infancy, there is not still enough data.

5. Conclusion

This study has demonstrated that AI has the potential to significantly enhance foreign language learning through personalized learning experiences, interactive engagement, and real-time feedback. AI-driven tools can supplement traditional learning by providing tailored exercises, automated assessment, and flexible learning opportunities. However, despite these advantages, limitations, such as a lack of contextual awareness, ethical concerns, and potential over-reliance on AI highlight the need for a balanced integration of AI and human instruction.

Future research should focus on how AI can best be combined with traditional teaching methods to maximize its benefits while mitigating its limitations. In addition, more longitudinal studies are needed to determine the sustained impact of AI-based language learning, reflecting variables, such as student motivation, creativity and thinking skills.

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