SHAPING THE FUTURE: ARTIFICIAL INTELLIGENCE AND THE ENGLISH LANGUAGE PEDAGOGY

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Abstract

Many tools are now available to support language instruction in the digital age. Technology has fundamentally altered how we teach and how students learn. Technology use in language instruction has become essential if our graduates are to remain effective and competitive in the global marketplace. With the use of technology, language instructors may produce dynamic and captivating materials that inspire and encourage students to learn. Additionally, it facilitates asynchronous lesson delivery, allowing language learners to progress at their own convenience and speed and thus improving retention and efficacy. This article provides an overview of some of the cutting-edge digital technologies and examines their application in English language pedagogy. The article examines intelligent tutoring systems, automated speech recognition, English learning speech assistant, chatbots, synthesia, virtual reality, automated writing evaluation, and computerized dynamic assessment. The necessity of providing teachers with a foundational understanding of AI technologies is one of the recommendations given for their implementation, as it will help them to better address the requirements of the global community and enhance the effectiveness of their instruction.

Key words: Artificial Intelligence, Second Language Pedagogy, English Language

Introduction

Digital gadgets and applications are being incorporated into all fields of human endeavour, including pedagogy, to improve teaching and learning, as a result of the advent of information and communication technology, which has brought about new inventions (Garrison, 2016). There is no denying that information and communication technology (ICT) is being used regularly by millions of individuals worldwide for a variety of purposes (Omachonu & Akanya,

2019).Panfilova et al. (2017) had predicted that the sales of digital gadgets would increase at a pace of 2.8% annually between 2017 and 2022. According to a number of academics studying innovative teaching techniques, the most efficient ways to teach and learn are through digital applications driven by artificial intelligence (AI) (Elaish et al., 2017; Kohnke et al., 2019).

The future of education and the degree to which AI can influence teaching and learning in classrooms are topics of continuous discussion. AI is going to alter the game in a lot of ways. One of the areas where artificial intelligence (AI) has the greatest potential to transform education is language teaching. With the help of digital language processing tools, artificial intelligence (AI) can provide individualized learning experiences, improve language assessment through automated grading and feedback, and enable immersive language practice (Wilson, 2023).In order to customize lesson plans and increase the effectiveness and engagement of language learning, AI-powered platforms can also analyze student data. Furthermore, AI can eliminate language barriers in a variety of ways, increasing accessibility to language learning for a worldwide audience. This paper's goal is to investigate how AI knowledge and application may shape language pedagogy in the future.

Artificial Intelligence
Through the use of technology, globalization and the industrial era 4.0 have produced new opportunities and creative thinking. As a result, technology is crucial to the transmission of information through text, images, and sound (Rahayu & Pujiyono, 2017). Artificial Intelligence is one technology that is being developed extensively. It is a computational creativity that has drawn more attention in technology (Cheng & Day, 2014). According to Rahman (2009), artificial intelligence (AI) produces software that performs autonomous tasks including computation and knowledge filtering. The field of artificial intelligence aims to create "intelligent" technology, such as computer systems and robots, that function and respond similarly to the human brain (Karsenti, 2019).Mehrotra (2019) defines artificial intelligence as a computer science technique that investigates the creation and study of intelligent devices and applications. It is the study of how to make a machine think and act like a person.
Artificial intelligence may not entail creating an immensely intelligent computer that can solve every issue, but rather creating a device that can perform tasks similar to those of human beings (Joshi, 2019). The goal of artificial intelligence is to create hardware or software for computers that can think like humans or exhibit traits that are typically associated with intelligence (Campesato, 2020). AI, as a theory of computer systems, is able to carry out activities that often need human intelligence. Artificial intelligence is able to comprehend speech understanding, language awareness, decision-making, and visual perception, among other characteristics of human intellect.

Artificial intelligence is in high demand right now because it can be used to create expert systems that can solve complicated issues like recognition and natural language processing (Devi et al., 2020). AI provides continuous, customized instruction in a low-stakes environment, giving

students the abundance of feedback and scaffolding exercises needed to become fluent. Artificial Intelligence is capable of performing human functions including language comprehension, planning, learning, and decision-making. The growth of artificial intelligence-powered digital platforms may also make teaching and learning English easier. Shin (2018) suggests that with artificial intelligence could do away with English teachers in the classroom, if we have a machine that can teach the language. This paper, however, disagrees with Shin's (2018) assertion. Meaningful learning cannot occur in a classroom without a teacher. Digital platforms are used to support teachers in their efforts to provide students a deeper understanding of what they are learning. Artificial intelligence in English language instruction is just to supplement the language teachers' efforts. Ribeiro (2020) concurs with this position that AI is not a substitute for human connection and empathy, which are crucial to the learning process. Wilson (2023) believes that although AI technologies are said to be more efficient, their function is by definition restricted to helping teachers. Wilson (2023) states, "AI may very well become an expert in the technical aspects of communication, but it is unlikely to capture our emotions and our personalities, which are, after all, particular to each of us" (P. 14). Therefore, rather than aiming to replace teachers, AI in education should help them and improve the educational experience for learners.

The effectiveness of using AI applications in language pedagogy has been the subject of numerous studies conducted recently (Tai & Chen, 2023; Zhai & Ma, 2022; Jiang, 2022; Evers & Chen, 2022; Kamrood et al., 2021). This plethora of studies on the application of AI in language teaching demonstrate that it is being widely embraced, and it is anticipated that its popularity will skyrocket in the near future. Without a question, Nigerian language classrooms must change to reflect the new global order in which artificial intelligence (AI) is a key component of language mediation, instruction, and learning. It would be prudent for us to start actively considering the role we envision AI to play in the future so that, when the time comes, we will be ready to respond to any questions it may pose and ensure that, rather than de-professionalizing or replacing the language teachers, its power will be applied to support them (Wison, 2023).

AI must be embraced in order to support and advance the teaching profession and provide the greatest instruction possible for language learners, even while it cannot completely replace instructors. AI can be used in language education in a number of ways. Some of them are presented here:

Intelligent Tutoring Systems (ITSs)
Intelligent learning systems (ITS) are computer-based educational systems that attempt to use conclusions about the learner's ability to understand topics and identify his weaknesses and strengths so that he can adapt the learning process dynamically (Alrakhawi, 2023). Intelligent Tutoring Systems (ITSs) are made to give learners dynamic, personalized instruction without the need for human teachers to get involved (Son et al., 2021).According to Liang et al., (2021), the

most prevalent application of AI in language instruction has been with Intelligent Tutoring Systems (ITSs). Choi (2016) claims that Intelligent Tutoring Systems can effectively and efficiently support language learning when applied in an EFL context. They can be utilized as AI tools and self-study programmes, or they can be added to more conventional methods of teaching languages. ITSs can be utilized with students of any age in any language learning environment (Xu et al., 2019). They take advantage of people's infatuation with digital technology to offer learning experiences that are condensed (Mohamed & Lamia, 2018).

By evaluating proficiency, identifying mistakes, and offering Corrective Feedback (CF), ITSs can offer users individualized experiences. They can also give students activities that are especially tailored to the areas they need to improve on, such as grammar, vocabulary, or pronunciation (Amaral &Meurers, 2011; Choi, 2016). They can also give people a perspective for their current circumstance. They could include cultural details about the language being learned, for instance. According to Choi (2016), grammatical concept acquisition can be supported by an Intelligent Computer-Assisted Language Learning (ICALL) tutoring system.

In their meta-analysis, Xu et al. (2019) examined the impact of ITSs use on reading comprehension for K–12 students and discovered that, in comparison to traditional education, ITSs had a greater effect size. In order to gain a better understanding of the concept, usage, effects, and evaluation of an intelligent teaching system, as well as the tools used to implement it, Alrakhawi et al. (2023) used the PRISMA technique to conduct a Systematic Literature Review (SLR). They discovered that intelligent tutoring systems, which are used in a variety of educational fields, have a significant impact on raising the educational attainment of most students, especially university students. They also motivate students to study on their own and serve as a valuable source of information.

Automatic Speech Recognition
The technique known as Automatic Speech Recognition (ASR) enables people to converse with a computer interface using their voices in a manner that, in its most advanced forms, mimics natural human speech (Zajechowski, 2023). The core of the most developed ASR technology available today is known as Natural Language Processing (NLP). This version of ASR gets the closest to enabling genuine communication between humans and artificial intelligence. AI and machine learning methods are used by ASR technology to comprehend and generate spoken and written language. It is frequently utilized in speech-to-text and voice recognition software programmes, including note-taking apps, automatic transcribers, and intelligent personal assistants (IPAs) (Evers & Chen, 2022). When a user dictates a message into a smartphone, ASR is utilized; the phone interprets the language and uses it to carry out an operation. Over the past ten years, ASR has advanced quickly, becoming increasingly accurate and widely used in a variety of industries (Daniels & Iwago, 2017). According to Golonka et al. (2014), who reviewed the many forms of technology and their efficacy, studies on ASR are primarily responsible for the quantifiable influence of technology on language acquisition.

Because users receive quick, customized, and independent feedback, the implementation of ASR in messaging applications, software, and websites helps to enhance L2 pronunciation (Dizon, 2017; McCrocklin, 2019; Dai & Wu, 2023). Bashori et al. (2022) looked into two websites for EFL learning that employ ASR to deliver various kinds of feedback. The treatment group, which used the ASR-based websites, saw improvements in both their receptive vocabulary and pronunciation when compared to the control group. Evers and Chen (2022) offered a useful method for practicing pronunciation using ASR technology. The note-taking app Speech notes (speechnotes.co), which transcribed their speech into text, was used by their EFL students to read aloud. After completing the transcription, they went over their errors. They said it helped the learners to go over their errors on their own, or especially with someone else. According to Evers and Chen's research, learners' pronunciation could be enhanced by combining technology-assisted real-time response (ASR) with peer feedback. ASR's incorporation into software and apps makes learning more dynamic, entertaining, and engaging, all of which boost motivation for language acquisition (Moussalli & Cardoso, 2020; Tai & Chen, 2023). The ability of ASR to tailor learning materials to the requirements and objectives of each student is another advantage. Google Assistant was determined by Chen et al. (2023) to be beneficial for individualized learning since learners could adjust the pace and information to suit their requirements.

English Language Speech Assistant (ELSA Speak)
A smart phone software called ELSA Speak employs artificial intelligence to enhance English pronunciation (Maria, 2023). With the help of the app, students can instantly receive feedback on their speech and make the required corrections. ELSA Speak is appropriate for students at the beginning, intermediate, and advanced levels. Additionally, ELSA Speak offers live sessions in which students utilize the app to practice speaking with English native speakers. Through the app, students may find and connect with highly qualified native English tutors for practice, sometimes at no cost and sometimes at a discounted rate. Maria (2023) claims that studying with ELSA for 27 hours is the same as taking an ESL speaking course at a US institution.

Vu Van created the English Learning Speech Assistant (ELSA) software in San Francisco, California, in 2015. To help with and develop English pronunciation, it makes use of speech recognition and artificial intelligence (Pilar, 2013). Learners can practice English words, phrases, and sentences by using the ELSA Speak programme, which offers a choice of courses on various subjects. An interactive dictionary is another component of the ELSA Speak programme that aids users in pronouncing words and phrases accurately. Rinaeip et al. (2022) conducted a study on the use of ELSA Speak to improve student learning achievement in pronunciation ability. They came to the conclusion that the ELSA Speak application meets students' needs because it is applicable to their daily activities and provides practice that is relatively simple to complete. Additionally, the application's learning media can improve students' attitudes and motivation because it employs engaging features and is reasonably simple to use on smartphones.

Chatbots

A chatbot is a software application that interacts with users via chat (Bibauw et al., 2019; Coniam, 2014; Wang et al., 2021) and encourages human conversations by asking and responding to text or audio questions (Kim et al., 2021). Chatbots are also referred to as bots, chatterbots, dialogue systems, conversational agents, virtual assistants, or virtual agents. According to Fryer et al. (2020) and Wang et al. (2021), chatbots are frequently seen on websites for businesses in a variety of sectors, including marketing, healthcare, technical assistance, customer service, and education. They offer visitors to these websites customized services.

When a user asks a question of a chatbot, it typically reads the input, considers the user's intent, and then responds to the user with a preprogrammed response (Kim et al., 2021; Smutny &Schreiberova, 2020). According to Ayedoun et al. (2019), chatbots possessing human-like appearances and social life-like attributes can emotionally engross learners in the experience through text, audio, and additional visual signals.These days, chatbots accomplish their objectives by utilizing methods like neural machine translation, pattern matching, and natural language processing (NLP) (Huang et al., 2018; Smutny & Schreiberova, 2020). Because chatbots have the potential to enhance language learning in novel ways, interest in them is growing (Wang et al., 2021). Huang et al. (2017) created GenieTutor, a dialogue-based chatbot for EFL learning, to focus on certain language learning interests, such as placing an order for takeout, or merely to have open discussions about any topic.

A chatbot can focus on particular subjects and areas of interest, have infinite patience, respond to requests instantly and in natural language, reduce learners' anxiety, which promotes communication and self-correction when mistakes are made, and work without the need for a human teacher or interlocutor (Bibauw et al., 2019; Coniam, 2014; Fryer et al., 2020). Learners can practice recently learned language or linguistic elements that they would not feel comfortable learning with another person (Fryer et al., 2020). According to Goda et al. (2014), using a chatbot before a group discussion increased student production and promoted critical thinking awareness.

Kim et al. (2021) found that, in using a chatbot, speaking performance was enhanced when speaking assignments were completed utilizing an AI bot via text or voice. Compared to the text-based chatbot and the face-to-face condition, the voice-based chatbot produced better results. According to Ayedoun et al. (2019), a chatbot that can execute communication techniques may promote openness to conversation. Coniam (2014) discovered that, in an alternative setting, chatbots typically responded to queries with grammar that was appropriate. Teachers will be able to spot mistakes made by students and arrange lessons to correct them if chatbots are able to give them logs of discussions between chatbots and students.

ChatGPT

ChatGPT is a form of chatbot, an AI-powered natural language processing tool that learners can utilize to converse in a manner akin to that of a human and accomplish a lot more (Ortiz, 2023). The language model can provide answers to queries and help students with assignments like writing essays, emails, and computer code. Recently, ChatGPT has attracted a lot of interest from a variety of sectors. Based on extensive databases, it generates comprehensive written answers to information requests. While ChatGPT has a significant issue with factual accuracy (Vincent, 2022), its impact on education is being discussed by many educators and researchers (Illingworth, 2023; Liu et al., 2023; Loble, 2023).Zhai (2022) conducted a pilot study on the usage of ChatGPT for academic paper writing. The results indicated that the text produced by the AI ChatGPT was logical and educational, and they recommended that educational efforts be directed on enhancing students' critical thinking and creative thinking. ChatGPT may present language teachers with a wealth of opportunities to improve language instruction and give their students an interesting language learning experience if properly designed and implemented (Son et al., 2023). Teachers can make the difficult terminology in their study notes easier for students to understand by using ChatGPT. They can enter the material from their notes into ChatGPT and have it rephrased in a clearer, more straightforward manner using its natural language processing features.

Synthesia

Synthesia is a synthetic media generation platform used to create AI generated video content. Language teachers can automate the process of creating instructive videos by using Synthesia. All the instructor has to do to assist them in creating video content is to give them text input. According to Wilson (2023), synthesia can be used to create videos in 120 languages. With the use of these tools, language teachers might create e-learning content much more quickly. In just a few minutes, Synthesia can create personalized instructional videos, giving teachers more time to complete more important tasks. The videos produced by this AI technology have the potential to significantly boost learning outcomes and students' engagement.With generative AI techniques, anyone will be able to create high-quality video with simple and intuitive interfaces; the creative possibilities are endless. Synthesia is a state-of-the-art paradigm shift in content creation for language pedagogy. In the not-too-distant future, synthetic media will replace the need for physical cameras and complex video editing tasks.

Virtual Reality

Virtual reality (VR) technology is a three-dimensional computer-generated environment that mimics a real-life experience (Zammit, 2023). With the immersive experience it delivers, users will be able to interact with the virtual environment as though they were physically there. The use of this technology allows, motion sensors, controllers, headsets, and other screen-equipped devices to be used as input methods. The sensors create a smooth experience by tracking the user's head and body movements and translating them into the virtual world (Tau, 2023). The

aim of virtual reality technology is to produce an experience that is so lifelike that users may not even realize they are in a simulated setting.

To accommodate a variety of learning preferences, virtual reality (VR) technology is being progressively included into educational environments, such as language-learning classes (Garduno et al., 2021). By mimicking settings, virtual reality (VR) offers a very immersive learning experience (Hamilton et al., 2021). With its special features, students can connect with language learning in a realistic and dynamic way. The engagement that virtual reality (VR) offers is especially helpful for kinesthetic learners since it gives them hands-on experiences that improve language acquisition (Garduno et al., 2021). Virtual reality (VR) can provide students with a simulated environment in which they can converse with native speakers, aiding the acquisition of a second language in situations when physical travel to practice a target language with native speakers may not always be viable (Panagiotidis, 2021).

Virtual reality (VR) has the potential to enhance vocabulary retention by making language learning classes more memorable (Yoshimura & Borst, 2021). Students can use several senses to reinforce their knowledge and memorization of new words and phrases through VR's immersive nature. Students are more likely to remember L2 vocabulary and strengthen their language abilities when they use the language in context. VR has a lot going for it, making it a potentially one of the best tools for teaching languages.

Automated Writing Evaluation

The purpose of Automated Writing Evaluation (AWE) is to enhance students' writing performance improvements by using educational technologies to deliver automated feedback and formative writing evaluation (Lin et al., 2020). Students can receive feedback on their written work through Automated Writing Evaluation (Link et al., 2022; Zhai & Ma, 2022). Students can learn important information about the kinds of mistakes they make. An automated causal discourse analyzer was created by Chukharev-Hudilainen and Saricaoglu (2016), who tested its accuracy in assessing essays produced by seven university students studying English as a second language (ESL). Their results validated computerized causal discourse analyzers as a useful tool for writing support. In another study on the usage of AWE with 75 Turkish EFL university students, Han and Sari (2022) discovered that their experimental group, which used both automated feedback and teacher feedback, showed larger gains than those in the teacher-only feedback group.

These studies demonstrate the effectiveness of this teaching approach driven by artificial intelligence. Teachers of languages ought to implement the use of AWE tools with their learners. Giving language learners the chance to utilize AWE tools can help them become more confident writers and improve their writing. Therefore, language educators may want to think about incorporating AWE into their lessons in order to give ESL students instantaneous, automatic

feedback. This technology can help close the writing skill gap and offer focused assistance for the development of ESL writers.

Computerized Dynamic Assessment

Dynamic Assessment (DA) is a strategy that concurrently blends teaching and assessment activities (Alsaadi, 2021). A language assessment can be conducted using the Dynamic Assessment method to ascertain a person's aptitudes and learning capacity. By considering how responsive a learner is to mediation help, it offers a nuanced and sympathetic view of their skills. Vygosky's theory of development, which holds that observing students' autonomous functioning only exposes a portion of their abilities, serves as the foundation for dynamic evaluation.

The Artificial Intelligence-Powered Computerized Dynamic Assessment (CDA) enables students to analyze language-related problems and receive automatic mediations (Ebadi &Saeedian, 2015; Kamrood et al., 2021). Corrective feedback (CF) has been a frequently discussed important topic in CDA. CF helps teachers better assess their students' skill levels and helps students receive feedback on their mistakes (Ebadi & Rahimi, 2019). Researchers have been interested in how computers might deliver suitable and effective CF, especially when it comes with the added advantage that many students can access an online version of CF simultaneously.

In a small-scale study, Ebadi and Rahimi (2019) employed a hybrid method to online dynamic evaluation with three EFL university students, using Google Docs (https://docs.google.com/) as a writer collaboration platform. Although their students had some trouble composing texts that were more complex, they had good opinions about the dynamic evaluation procedure.Another study conducted by Zhang and Lu (2019) examined the use of a CDA listening test with 19 Chinese language learners at an American university. The results showed that the diagnostic language assessment was successful in both assessment and in assisting teachers in providing more individualized support for students. The assessment allowed for flexibility in terms of test location and time. Dynamic assessment has been shown to be a very beneficial way to integrate teaching with assessment and give language learners the most authentic tasks to probe their learning (Alsaadi, 2021).

Conclusion

With a thorough grasp of the factors that must be taken into account when implementing AI-supported language learning and teaching, language teachers need to make sure that AI is utilized to help language learning and teaching in contexts that are powered by AI. They must be equipped to support learning experiences in particular situations and to leverage AI technology and apps. In their practices in AI contexts, they also need to consider how to handle human skills like creativity, teamwork, and critical thinking. There are opportunities and challenges associated with using AI technology in second language instruction. Because of this, language instructors must never stop researching and developing new ideas in order to fully realize AI's promise to enhance students' learning.

Recommendations

In order to guarantee the effective integration of AI technology into language education, the following recommendations are put forth:

1. Teachers need to be trained on the basic knowledge of AI technologies to enable them to understand how to use these technologies effectively to improve teaching effectiveness and meet students' needs.
2. AI technology should be applied to personalize language pedagogy, automatically adjusting teaching content and methods based on students' learning situation and characteristics.
3. Humanized teaching methods should be developed by leveraging AI technology's advantages in interactivity and fun to enhance students' interest and motivation in learning.
4. Continuous exploration and innovation of AI technology's application methods and approaches in second language teaching is necessary to improve the teaching effect continuously.
5. Researchers are recommended to respond to the need for more rigorous research on AI technologies and applications for L2 pedagogy.

References

Alrakhawi, H. A.,Jamiat, N. & Abu-Naser, S. S. (2023). Intelligent systems in education: A systematic review of usage, tools, effects, and evaluation. *Journal of Theoretical and Applied Information Technology, 101*(4), 1205-1226.

Alsaadi, H. M. A. (2021). Dynamic assessment in language learning: An overview of the impact of using social media. *English Language Teaching, 14*(8), 73-82.

Amaral, L. A., &Meurers, D. (2011). On using intelligent computer-assisted language learning in real-life foreign language teaching and learning. ReCALL, 23(1), 4–24.

Ayedoun, E., Hayashi, Y., & Seta, K. (2019). Adding communicative and affective strategies to an embodied conversational agent to enhance second language learners' willingness to communicate. *International Journal of Artificial Intelligence in Education, 29*, 29–57.

Bashori, M., Van-Hout, R., Strik, H., &Cucchiarini, C. (2022). Look, I can speak correctly: Learning vocabulary and pronunciation through websites equipped with automatic speech recognition AI technologies and applications. *Computer Assisted Language Learning*,12, 15-29.

Bibauw, S., François, T., & Desmet, P. (2019). Discussing with a computer to practice a foreign language: Research synthesis and conceptual framework of dialogue-based CALL. *Computer Assisted Language Learning, 32*(8), 1–51.

Campesato, O. (2020). *Artificial intelligence, machine learning, and deep learning*. Stylus

Publishing, LLC.

Chen, H. H.-J., Yang, C. T. Y., & Lai, K. K. W. (2023). Investigating college EFL learners' perceptions toward the use of Google Assistant for foreign language learning. *Interactive Learning Environments, 31(3), 1335–1350*

Cheng, S.M., & Day, M.-Y. (2014). Technologies and applications of artificial intelligence: Proceedings of the19th International Conference, TAAI 2014, Taipei, Taiwan, November 21-23. Springer.

Choi, I.-C. (2016). Efficacy of an ICALL tutoring system and process-oriented corrective feedback. *Computer Assisted Language Learning, 29(2), 334–364.*

Chukharev-Hudilainen, E., &Saricaoglu, A. (2016). Causal discourse analyzer: Improving automated feedback on academic ESL writing. *Computer Assisted Language Learning, 29*(3), 494–516.

Coniam, D. (2014). The linguistic accuracy of chatbots: Usability from an ESL perspective. *Text and Talk, 35*(5), 545–567.

Dai, Y., & Wu, Z. (2023). Mobile-assisted pronunciation learning with feedback from peers and/or automatic speech recognition: A mixed-methods study. *Computer Assisted Language Learning, 36*(5–6), 861–884.

Daniels, P., &Iwago, K. (2017). The suitability of cloud-based speech recognition engines for language learning. The JALT CALL Journal, 13(3), 229–239.

Devi, K. G., Rath, M., & Linh, N. T. D. (2020). *Artificial intelligence trends for data analytics using machine learning and deep learning approaches.* CRC Press.

Dizon, G. (2017). Using intelligent personal assistants for second language learning: A case study of Alexa. *TESOL Journal, 8*(4), 811–830.

Ebadi, S., & Rahimi, M. (2019). Mediating EFL learners' academic writing skills in online dynamic assessment using Google Docs. *Computer Assisted Language Learning, 32*(5–6), 527–555.

Ebadi, S., &Saeedian, A. (2015). The effects of computerized dynamic assessment on promoting at-risk advanced Iranian EFL students' reading skills. *Issues in Language Teaching, 4*(2), 1–26.

Elaish, M. M., Shuib, L., Ghani, N. A., Yadegaridehkordi, E., & Alaa, M. (2017). Mobile learning for English language acquisition: Taxonomy, challenges, and recommendations. IEEE Access: Practical Innovations, Open Solutions, 5, 19033–19047.

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.

Fryer, L. K., Coniam, D., Carpenter, R., &Lăpușneanu, D. (2020). Bots for language learning

now: Current and future directions. *Language, Learning and Technology, 24*(2), 8–22.

Garrison, D. R. (2016). E-learning in the 21st century: A community of inquiry framework for research and practice. Taylor & Francis.

Goda, Y., Yamada, M., Matsukawa, H., Hata, K., &Yasunami, S. (2014). Conversation with a chatbot before an online EFL group discussion and the effects on critical thinking. *Journal of Information Systems Education, 13*(1), 1–7.

Golonka, E. M., Bowles, A. R., Frank, V. M., Richardson, D. L., &Freynik, S. (2014). Technologies for foreign language learning: A review of technology types and their effectiveness. *Computer Assisted Language Learning, 27*(1), 70–105.

Han, T., & Sari, E. (2022). An investigation on the use of automated feedback in Turkish EFL students' writing classes. *Computer Assisted Language Learning,35*(2), 23- 36

Huang, J.-X., Kwon, O.-W., Lee, K.-S., & Kim, Y.-K. (2018). Improve the chatbot performance for the DB-CALL system using a hybrid method and a domain corpus. In P. Taalas, J. Jalkanen, L. Bradley & S. Thouësny (Eds.), Future-proof CALL: Language learning as exploration and encounters – short papers from *EUROCALL 2018* (pp. 100–105). Research-publishing.net.

Illingworth, S. (2023). ChatGPT: Students could use AI to cheat, but it's a chance to rethink assessment altogether. The Conversation. https://theconversation.com/chatgpt-students-could-use-ai-to-cheatbut-its-a-chance-to-rethink-assessment-altogether-198019

Jiang, R. (2022). How does artificial intelligence empower EFL teaching and learning nowadays? A review on artificial intelligence in the EFL context. *Frontiers in Psychology, 13*(1), 49 54.

Joshi, A. V. (2019). *Machine learning and artificial intelligence*. Springer Nature.

Kamrood, A. M., Davoudi, M., Ghaniabadi, S., & Amirian, S. M. R. (2021). Diagnosing L2 learners' development through online computerized dynamic assessment. *Computer Assisted Language Learning, 34*(7), 868–897.

Karsenti, T. (2019). Artificial intelligence in education: The urgent need to prepare teachers for Tomorrow's schools. *Formation et Profession, 27*(1), 105.

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), 161–178.

Kohnke, L., Zhang, R., & Zou, D. (2019). Using mobile vocabulary learning apps as aids to knowledge retention: Business vocabulary acquisition. *Journal of Asia TEFL, 16*(2), 683–690.

Li, Z., Feng, H.-H., &Saricaoglu, A. (2017). The short-term and long-term effects of AWE

feedback on ESL students' development of grammatical accuracy. CALICO Journal, 34(3), 355–375.

Liang, J.-C., Hwang, G.-J., Chen, M.-R. A., &Darmawansah, D. (2021). Roles and research foci of artificial intelligence in language education: An integrated bibliographic analysis and systematic review approach. *Interactive Learning Environments*.

Link, S., Mehrzad, M., & Rahimi, M. (2022). Impact of automated writing evaluation on teacher feedback, student revision, and writing improvement. *Computer Assisted Language Learning, 35*(4), 605–634.

Liu, D., Bridgeman, A., & Miller, B. (2023). As universities goes back, here's how teachers and students can use ChatGPT to save time and improve learning. The Conversation. https://theconversation.com/as-unigoes-back-heres-how-teachers-and-students-can-use-chatgpt-to-save-time-and-improve-learning199884

Loble, L. (2023). The rise of ChatGPT shows why we need a clearer approach to technology in schools. The Conversation. https://theconversation.com/the-rise-of-chatgpt-shows-why-we-need-a-clearerapproach-to-technology-in-schools-199596

Maria, C. (2023). ELSA Speak review by teacher and students. Retrieved from https://www.tprteaching.com/elsa-speak-review/

McCrocklin, S. (2019). Learners' feedback regarding ASR-based dictation practice for pronunciation learning. *CALICO Journal, 36*(2), 119–137.

Mehrotra, D. D. (2019). *Basics of artificial intelligence & machine learning*. Notion Press.

Mohamed, H., & Lamia, M. (2018). Implementing flipped classroom that used an intelligent tutoring system into learning process. *Computers & Education, 124*, 62–76

Moussalli, S., & Cardoso, W. (2020). Intelligent personal assistants: Can they understand and be understood by accented L2 learners? *Computer Assisted Language Learning, 33*(8), 865–890.

Ortiz, S. (2023). What is ChaGPT and why does it matter? Retrieved form https://www.zdnet.com/article/what-is-chatgpt-and-why-does-it-matter-heres-everything-you-need-to-know/

Panfilova, V.; Spichak, V. &Zhumakhanova, A. (2017). Educational mobile-games as a tool for increasing vocabulary when learning a foreign language. *International Journal of Web-based Learning and Teaching Technologies, 17*(1), 1-27.

Rahman, S., Mahbubur, H. (2009). *Methods and applications for advancing distance education technologies: International Issues and Solutions.* IGI Global.

Ribeiro, R. (2020). *Artificial intelligence in English language learning*. Cambridge University Press

Rinaepi, H., Triwardani, R. & Azi, N. R. (2022). The effectiveness of ELSA Speak application to improve pronunciation ability. *Journal FakultasKeguruan and Ilma Pendidikan, 3*(1), 28-33.

Shin, M.-H. (2018). How to use artificial intelligence in the English language learning classroom. *Indian Journal of Public Health Research & Development, 9*(9), 557.

Smutny, P., &Schreiberova, P. (2020). Chatbots for learning: A review of educational chatbots for the Facebook Messenger. *Computers & Education, 151,* 103862.

Son, J. B., Ružić, N. K. & Philpott, A. (2023). Artificial intelligence technologies and applications for language learning and teaching. *Journal of China Computer- Assisted Language Learning, 10*(2), 1-19

Tai, T. Y., & Chen, H. H. J. (2023). The impact of Google Assistant on adolescent EFL learners' *Interactive Learning Environments, 31*willingness to communicate. (3), 1485–1502.

Tau, A. (2023) Cutting edge learning technologies to revolutionize trainings. https://doi.org/10.1080/09588221.2022. 2056204

Vincent, J. (2022). AI-generated answers temporarily banned on coding Q&A site stack overflow. Verge. https://www.theverge.com/2022/12/5/23493932/chatgpt-ai-generated-answers-temporarilybanned-stack-overflow-llms-dangers

Wang, X., Pang, H., Wallace, M. P., Wang, Q., & Chen, W. (2022). Learners' perceived AI presences in AI-supported language learning: A study of AI as a humanized agent from community of inquiry. *Computer Assisted Language Learning*. https://doi.org/10.1080/09588221.2022. 2056203

Wilson, D. G. (2023). *Shaping the future: Artificial intelligence and the English language teaching industry*. British Council.

Zajechowski, M. (2023). Automatic speech recognition (ASR) software: An introduction. Retrieved from:*https://usabilitygeek.com/automatic-speech-recognition-asr-software-an-introduction/*

Zhai, X. (2022). ChatGPT user experience: Implications for education. *Social Science Research Network* (SSRN). https://doi.org/10.2139/ssrn.4312418

Zhai, N., & Ma, X. (2022). Automated writing evaluation (AWE) feedback: A systematic investigation of college students' acceptance. *Computer Assisted Language Learning, 35*(9), 2817–2842.