International Journal of Engineering Inventions
e-ISSN: 2278-7461, p-ISSN: 2319-6491
Volume 14, Issue 3 [March. 2025] PP: 29-37

Impact of Artificial Intelligence Technology on English Language Teaching and Learning

NGUYEN THI TUYET
Fundamentals Division, The University of Danang – Vietnam-Korea University of Information and Communication Technology, Vietnam

ABSTRACT: *This research paper presents the impact of Artificial Intelligence technology on English language teaching, focusing on its potential to support both learners and educators. Artificial Intelligence has undergone exponential growth and has been overwhelmingly permeated in the educational field, including English language education. Many individual studies have paid close attention to probing the effect of AI on learning. To fill the research gap and strengthen the statistical power, this article aims to carry out a meta-analysis for examining the effectiveness of AI on English learning outcomes.*
Keywords: *Artificial Intelligence, English teaching, learning outcomes, effectiveness.*

Date of Submission: 02-03-2025 Date of acceptance: 11-03-2025

I. INTRODUCTION

The integration of Artificial Intelligence (AI) technology in education has revolutionized teaching and learning methodologies. As the demand for being more efficient, personalized, and accessible learning experiences grows, AI has emerged as a powerful tool in the classroom. In the context of teaching English, AI-driven applications have shown immense potential to enhance language acquisition, improve student engagement, and support teachers in their instructional efforts.

AI technologies, such as natural language processing (NLP), machine learning algorithms, and intelligent tutoring systems, are being increasingly utilized to personalize learning, provide real-time feedback, and create immersive learning environments. These advancements allow students to engage with the language in innovative ways, whether through interactive chatbots, speech recognition tools, or personalized language practice platforms. Furthermore, AI enables the analysis of student performance data, offering valuable insights that can guide instructional decisions and improve learning outcomes.

This research study explores the impact of AI technology on English language teaching, focusing on its potential to support both learners and educators. By examining current trends, challenges, and opportunities in AI-assisted language instruction, this study aims to provide a comprehensive understanding of how AI can transform English language teaching practices and enhance the overall learning experience.

II. CATEGORIZATION OF LEARNING SPACE

The integration of AI in English language learning has led to the creation of diverse learning spaces that cater to various aspects of language acquisition. These spaces can be categorized based on the type of AI technology used, the mode of interaction, and the level of learner engagement. The categorization of learning spaces in studying the English language using AI reveals a diverse range of environments that cater to different learning needs and preferences. From traditional, AI-enhanced classrooms to entirely virtual and asynchronous platforms, AI offers flexibility, personalization, and continuous feedback that enhance the learning experience. By integrating AI into physical, virtual, and hybrid spaces, educators can create dynamic learning environments that promote engagement, autonomy, and effective language acquisition. As technology continues to advance, the categorization of learning spaces will likely evolve further, offering even more diverse and inclusive opportunities for English language learners. Below is a categorization of such learning spaces:

- **Personalized Learning Spaces** These spaces leverage AI's ability to adapt to individual learner needs, tailoring content, pacing, and feedback according to the learner's proficiency and progress.
- **Interactive and Immersive Learning Spaces** These spaces focus on creating engaging and realistic scenarios that simulate real-life communication, often involving conversational AI or immersive technologies such as virtual reality (VR).
- **Collaborative and Social Learning Spaces** AI facilitates collaborative learning environments where learners can interact with peers or AI systems, fostering teamwork, communication, and shared knowledge-building

- **Assessment and Feedback-Oriented Learning Spaces** These learning spaces focus on evaluation and real-time feedback mechanisms, where AI plays a key role in providing data-driven insights and feedback on learners' performance.
- **Adaptive Learning Spaces** AI facilitates environments that continuously adjust to the learner's evolving needs based on performance metrics, ensuring that each student receives a unique learning pathway.
- **Autonomous Learning Spaces** These spaces allow learners to control their own learning journey with minimal guidance, relying on AI to provide the necessary resources, content, and feedback
- **Content Creation and Development Spaces** These spaces focus on using AI tools to help learners generate English-language content, enhancing their creativity and practical language skills.
- **Assessment and Certification Spaces** AI can streamline assessment and certification processes by automating the evaluation of learner performance and issuing credentials upon completion.

III. RELATED STUDY

Geographical Locations

From the examination of the geographic locations in which the studies took place, there was a large trend in studies conducted in Asia with 31 of the 42 studies conducted in this continent. In an examination of the locations with the largest number of publications, the three top locations were in Asia, with China (8), Taiwan (7) and Japan (4), see Figure 1. Extant systematic reviews on AI across all educational disciplines that took place prior to 2021 show a clear trend of at least 50% taking place in the United States with Asia following second (eg, Chen et al., 2020; Crompton et al., 2022). Reviews since 2021 show Asia leading the number of publications with China at the top of those numbers (eg, Crompton & Burke, 2023). Scholars report the rapid trend in AI publications and patents from China as more funding and incentives are provided (Li et al., 2021).

Figure 1: Geographical Locations

This study shows this trend increasing dramatically with 72% of the papers from Asia, with 19% from China. However, this study is focused on English language teaching and learning (ELT/L), therefore, it is interesting to note that these studies are from countries that do not use English as the primary language. There are often migrants and displaced populations that are in countries, such as the UK, however, the majority of studies are not conducted in English-speaking countries. This may connect with Lan et al.'s (2020) posit that English is one of the most used languages for jobs, markets, tourism, discourse and international connectivity. From the data, in those regions where English is not the primary language, Asia appears to be leading the way in AI research. It would be interesting for future researchers to examine if Asia is producing more AI studies across disciplines or just targeting investigations to ELT/L.

Geographical location has a profound impact on the accessibility and effectiveness of AI in studying English. Factors such as internet connectivity, access to technology, economic conditions, cultural and linguistic differences, and the availability of social support networks all influence how learners engage with AI tools. While learners in developed, urban, and high-income regions may have greater access to high-quality AI resources, those in rural, developing, or low-income areas may face barriers to utilizing AI effectively. Understanding the geographical impact on AI-assisted English learning can help educators, policymakers, and technology developers create more inclusive, accessible, and effective language learning solutions for diverse global populations.

Levels of Education

The data reveal that the majority of studies took place in higher education. Yang and Kyun (2022) and Sharadghah and Sa'id (2022) examined K-12 and higher education and had similar findings that of the two, higher education had substantially more publications. K-12 may have used AI less due to AI tools' age restrictions. For example, OpenAI restricted the use of their products to 18-year-olds, only changing this to 13 years with parental guidance when they released ChatGPT at the end of 2022. This age restriction may account for lower numbers in K-12 in prior years. However, the age trend does not flow through into adult ELT/L. This systematic review is one of the first studies to examine AI and ELT/L across all three learner levels: K-12, higher education and adults. The numbers show a dramatic gap in peer-reviewed research in adult ELT/L.

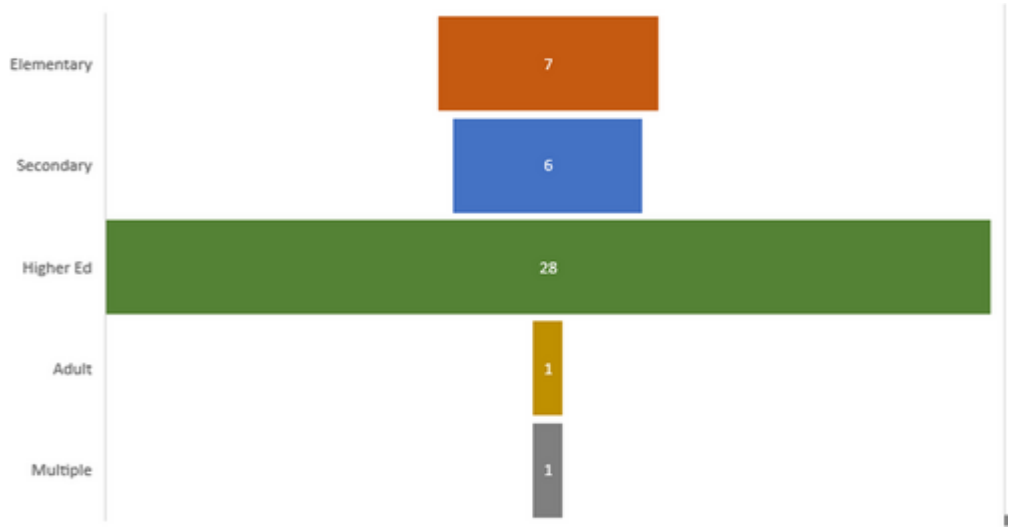

Figure 2: Levels of Education

In any studies involving pupils, the high numbers in higher education may also be due to accessibility of study participants. Faculty in higher education who publish their studies could have easier access to participants from their own institution, which also may require less stringent ethic approvals than working with young learners. However, it is important for researchers to have an understanding of how AI is being used in ELT/L across all learners. More research is needed to fill this gap.

Use of AI in ELT/L

From the grounded coding, six codes emerged from the way AI was being used. Extant systematic reviews focused on a priori categories that had the researchers only looking for key aspects, such as language skills of speaking, writing, listening and reading (Sharadgah & Sa'di, 2022; Yang & Kyun, 2022). The grounded coding approach used in this study was used to reveal the trends that emerged from the literature on what was actually being studied. The grounded coding did reveal skills related to speaking, writing and reading, while the aspect of listening did not emerge from the data. With that grounded approach, discernible patterns also surfaced regarding the utilisation of AI in ETL/L with studies to enrich and broaden pedagogical practices, bolster pupil self-regulation and explore connections with affective objectives.

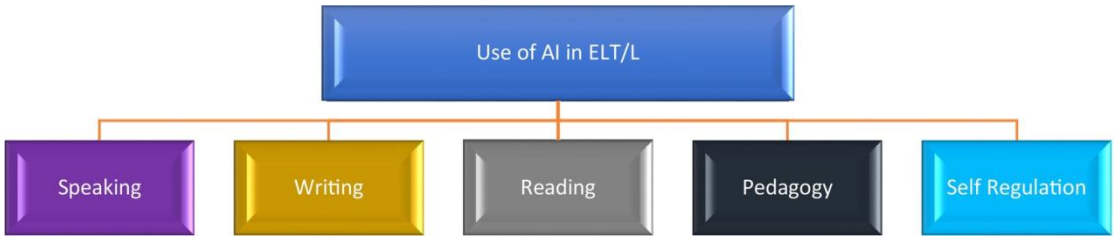

Figure 3: Use of AI in ELT/L

Speaking

Further investigation of the studies which had students practising speaking skills as the main use of AI revealed three axial codes: subskill, pedagogy and technology. The only speaking subskill revealed in the studies was a focus on pronunciation. Nonetheless, pronunciation was a common focus in these studies. There were a variety of AI systems and programs that helped pupils in this area. As Tokoz-Goktepe (2014) posited, a challenge for ELT/L is often the limited connections to English outside the language courses. AI can help to provide those connections. Liu and Hung (2016) used a system for teaching pronunciation to pupils in Taiwan and found that the AI significantly improved pupils' pronunciation by reducing the flatness of pitch and intonation patterns. The researchers found that the visual representation of the pitch as a spectrogram provided by the AI was helpful in supporting pronunciation.

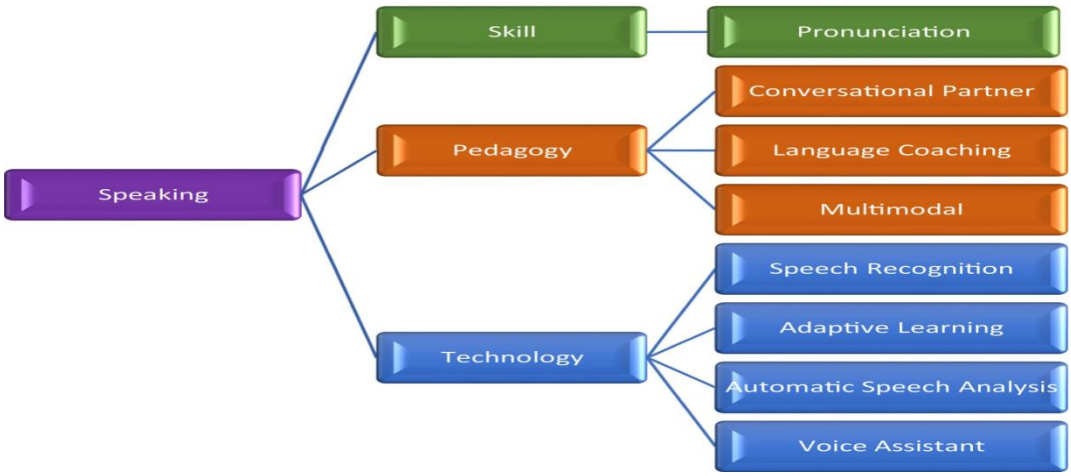

Figure 4: Speaking

Writing

Similar to the speaking code, the studies revealed the axial codes of subskills, pedagogies and technologies. Two subskills of writing that emerged from the papers were vocabulary learning and grammar. Lo (2023) examined pupils' vocabulary improvement and retention in writing when pupils had access to neural machine translation programs. The researchers reported that this AI system helped to improve or expand vocabulary, especially when specialised or unambiguous expressions are involved. One of the common uses of AI in writing revealed by this study is the use of AI grammar checkers. This finding follows a trend across disciplines of the use of grammar feedback tools, for example, Grammarly (Koltovskaia, 2020). Dizon and Gayed (2021) specifically examined the impact of Grammarly when used in higher education ELT/L. He found that using this AI tool, pupils had fewer grammatical errors and wrote with more lexical variation than pupils without the AI. The predictive text and real-time corrective feedback supported pupils studying English, especially novice writers. Educators have expressed apprehensions about pupils potentially becoming 'complacent' and utilising AI tools (such as grammar checkers or automatic translation tools) as a shortcut to learning (Bozkurt et al., 2023). However, the findings of this study suggest that AI-powered tools can be used to aid pupils in enhancing their writing skills. For practitioners looking to help pupils develop the vital skill of writing, it appears that there is value in real-time corrective feedback and the use of AI to extend vocabulary.

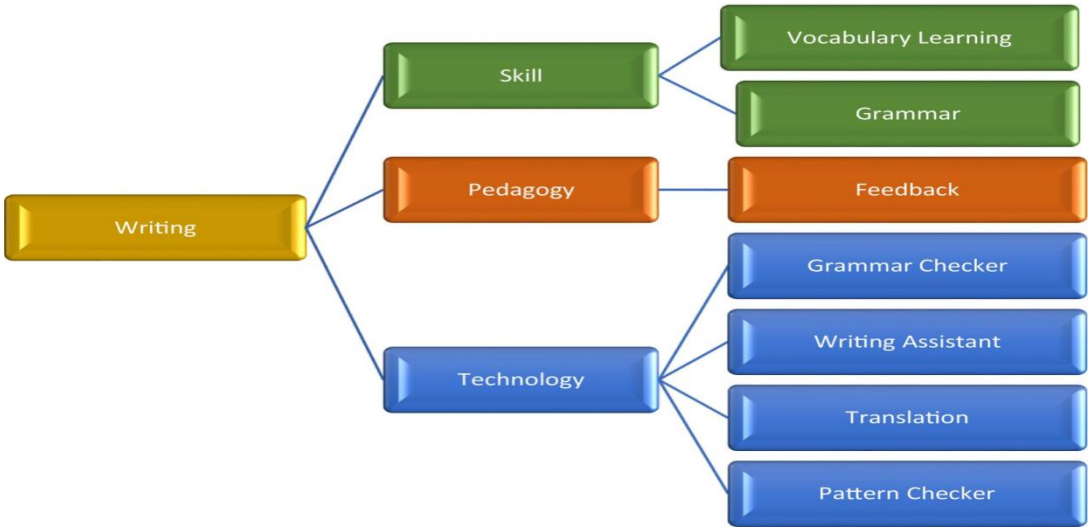

Figure 5: Writing

Reading

Reading did appear from the grounded coding. However, it was not as common in the data as speaking and writing. This reduced focus on reading is similar to the findings of Sharadgah and Sa'di (2022). This may be due to the extensive affordances of AI in natural language processing aligned to speaking and writing that researchers want to use, with reading less aligned to those AI affordances. Nonetheless, there were AI ELT/L studies focused on reading subskills, pedagogies and technology resulting in five axial codes.

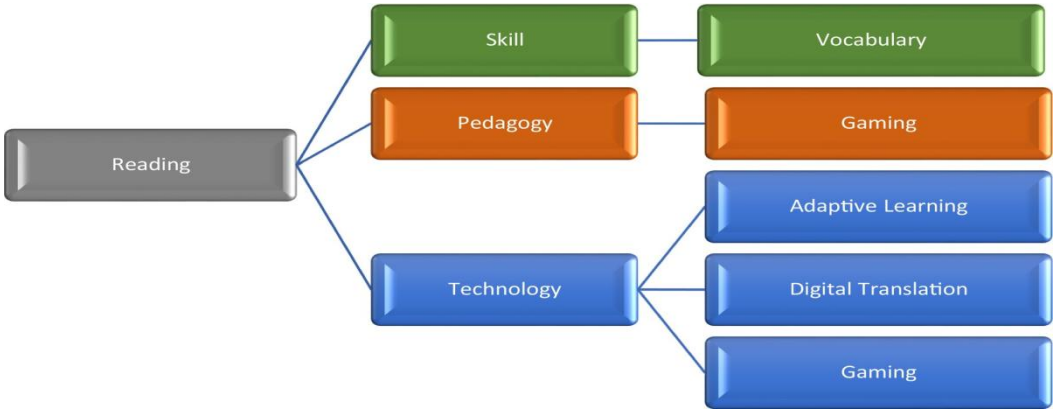

Figure 6: Axial codes for reading

IV. Development of Human Growth in the use of AI

The advent of Artificial Intelligence (AI) has sparked profound changes in various sectors, including education. As the world becomes more interconnected and technology continues to evolve, AI is increasingly being used in teaching and learning processes. AI offers personalized learning, enhances student engagement, and automates administrative tasks, thereby contributing to human growth and development. This essay explores the ways in which AI is transforming human growth in education, focusing on its applications in teaching and its broader societal impacts.

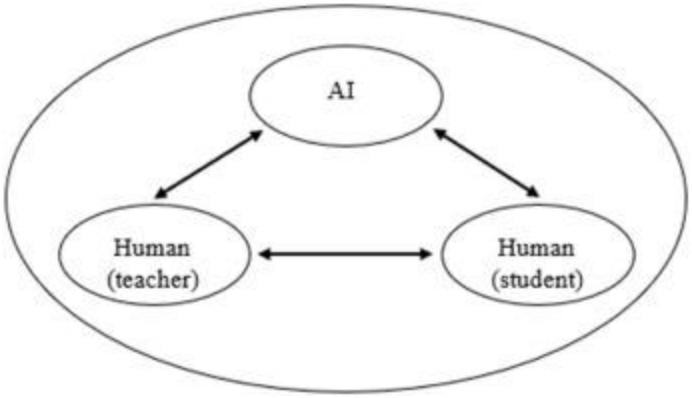

Figure 7: Development of Human Growth in the use of AI

AI has the potential to revolutionize education and significantly contribute to human growth. By offering personalized learning, enhancing teacher-student interactions, and supporting cognitive and emotional development, AI is paving the way for a more inclusive, equitable, and dynamic educational experience. However, it is important to address ethical concerns and ensure that AI tools are used responsibly to maximize their positive impact. As AI continues to evolve, it will play an increasingly central role in shaping the future of education, fostering the growth of individuals, and preparing them for the challenges of the digital age.

Artificial Intelligence (AI) has rapidly emerged as one of the most transformative technologies of the 21st century, significantly impacting various facets of human life, from communication and education to healthcare and business. While AI has the potential to drive economic growth and technological advancement, its effects on human growth—whether cognitive, emotional, or social—are profound and multifaceted. The development of human growth in the use of AI is not just about technological progression but also about how humans adapt, learn, and evolve in an increasingly AI-driven world.

The development of human growth through the use of AI represents a dynamic and complex relationship between humans and technology. From cognitive and emotional development to economic growth and workplace transformation, AI has the potential to enhance human abilities and improve quality of life. However, it is essential that we address the ethical, social, and practical challenges that accompany this growth, ensuring that AI is used responsibly and inclusively. As we continue to explore the intersection of AI and human potential, the future holds exciting possibilities for how AI can contribute to human development in ways that were once unimaginable.

V. Special Education

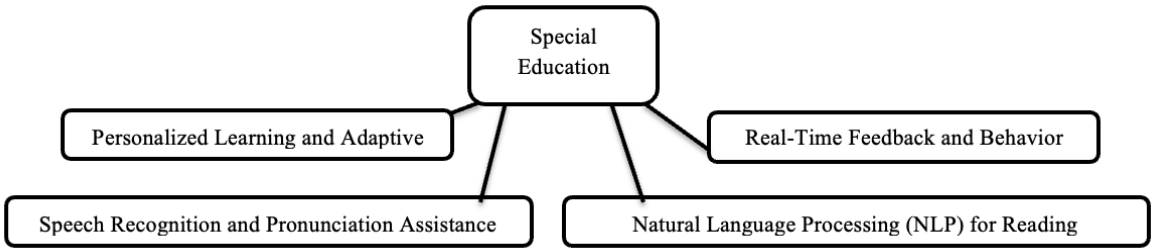

Figure 8: Special Education with AI

Personalized Learning and Adaptive Systems

Personalized learning refers to tailoring educational experiences to meet the unique needs, interests, and abilities of individual learners.AI-driven platforms can adapt lessons based on the learner's pace, progress, and preferences, which is especially beneficial for students with learning disabilities such as dyslexia, autism, or ADHD.

Speech Recognition and Pronunciation Assistance

AI-based speech recognition systems analyze spoken language and convert it into text, while pronunciation tools help learners improve their accent and fluency. Students with speech or hearing impairments, AI can be an invaluable tool for language acquisition by providing feedback on pronunciation and assisting with communication.

Natural Language Processing (NLP) for Reading Comprehension

NLP refers to AI's ability to understand, interpret, and generate human language. In language learning, NLP tools can be used to assess and improve reading comprehension. For students with dyslexia, ADHD, or cognitive disabilities, NLP tools can break down texts into simpler, more digestible parts, provide immediate definitions of difficult words, and offer text-to-speech functionality to enhance comprehension.AI can **summarize texts** to help students grasp key points, identify complex sentence structures, and focus on essential vocabulary, which makes learning English easier for students with language processing difficulties.

Real-Time Feedback and Behaviour Tracking

AI can track student behaviour and provide real-time feedback, such as monitoring attention levels or emotional states, to help teachers intervene when necessary. AI tools can track the behaviour of students with ADHD, autism, or emotional disabilities, providing teachers with insights into when a student may need a break, more focus, or a change in teaching strategy. By analyzing patterns in student behaviour, AI can help develop tailored interventions. These tools can also be used to monitor progress, adjusting tasks to prevent frustration or boredom, and encouraging perseverance.

AI has the potential to revolutionize English language teaching for students with special educational needs. By providing personalized learning experiences, adaptive systems, speech and pronunciation assistance, and innovative tools for students with a range of disabilities, AI makes English language acquisition more accessible, engaging, and inclusive. As AI technology continues to evolve, it holds the promise of further enhancing the educational experience for students with special needs, ensuring that no learner is left behind.

AI (Artificial Intelligence) has the potential to significantly transform the learning experience for students with special needs, particularly in the context of studying the English language. Special education students often face unique challenges, including learning disabilities, physical impairments, and other conditions that may hinder their ability to fully engage with traditional teaching methods. By integrating AI into special education, students can benefit from personalized, adaptive, and supportive tools designed to cater to their individual learning needs.

VI. Pedagogy

Pedagogy was the code used to identify the methods, strategies and techniques used to facilitate ELT/L. Pedagogies were often connected to language skills and also appeared earlier in the axial codes for those skills.

Speaking	Writing	Reading
Conversational partner	Feedback	Gaming
Language coaching		
Multimodal approach		

Figure 9: Pedagogy of English language teaching and studying with AI

AI is reshaping the pedagogy of English language teaching and studying in powerful ways. From personalized learning to interactive, gamified experiences and real-time feedback, AI is enhancing the learning experience for students by making it more engaging, inclusive, and efficient. As AI continues to evolve, it will further revolutionize the field of English language teaching, empowering both teachers and students to reach their full potential. The pedagogical shift facilitated by AI emphasizes not just teaching English but also fostering self-directed, autonomous, and lifelong learning. AI can significantly enhance traditional pedagogical approaches by personalizing learning experiences, automating repetitive tasks, and offering learners opportunities for continuous practice outside the classroom. The integration of AI into language learning introduces innovative teaching practices, but also requires careful consideration of its pedagogical implications.

VII. Description about AI/IT in Studying and Teaching English Language

The integration of AI and Information Technology (IT) into the study and teaching of the English language has transformed traditional approaches to language education. By leveraging AI and IT tools, educators and learners benefit from personalized, efficient, and interactive learning experiences.

AI and IT have become integral to English language education, offering transformative ways to teach and learn. By personalizing instruction, fostering collaboration, and enhancing accessibility, these technologies are paving the way for more effective and engaging language learning experiences. However, the success of AI and IT integration depends on addressing challenges like equity, ethical use, and teacher training. As these technologies evolve, they hold immense potential to revolutionize the teaching and studying of English globally.

AI and IT in the Classroom: Teacher Support

For educators, AI and IT can serve as powerful tools to manage the classroom environment and offer more effective instruction. One of the most valuable applications is automated grading systems, which save teachers time by grading assignments, quizzes, and essays. Tools like Grammarly and Turnitin provide instant grammar and plagiarism checks, enabling teachers to focus their energy on providing personalized feedback and facilitating discussions. In addition, AI-driven platforms can offer teachers detailed insights into student progress by analyzing data from assignments and quizzes. These insights allow educators to identify areas where students are struggling, enabling them to target instruction accordingly.

Benefits of AI and IT in English Language Education

The benefits of AI and IT in English language education are vast and far-reaching. For students, one of the most significant advantages is the personalized learning experience. AI can adapt to individual learning styles and progress, offering tailored exercises and suggestions that suit each student's specific needs. This level of personalization ensures that students can work at their own pace, building confidence in areas where they excel and receiving extra support in areas where they struggle.

Challenges and Considerations

Despite the many advantages, the use of AI and IT in language learning is not without challenges. One of the primary concerns is the lack of human interaction. While AI chatbots and virtual tutors are excellent for individual practice, they cannot replace the nuanced understanding and empathy that human teachers provide. Language learning involves complex social and emotional dynamics, such as cultural context and personal expression, which AI is not fully capable of addressing.

Another challenge is the reliance on technology, which may exclude students who do not have access to smartphones, computers, or the internet. In areas where digital resources are limited, students may not benefit from the advancements in AI and IT, exacerbating educational inequalities.

VIII. Conclusion

In conclusion, the impact of Artificial Intelligence (AI) on studying the English language is profound and multifaceted, revolutionizing how learners engage with and master the language. AI-driven tools, such as language learning apps, speech recognition systems, and chatbots, have significantly enhanced accessibility, personalization, and efficiency in language acquisition. These technologies provide tailored learning experiences, offer real-time feedback, and create interactive environments that foster student engagement and motivation. Furthermore, AI empowers educators by streamlining administrative tasks, improving grading accuracy, and providing valuable insights into student progress. However, the widespread use of AI also raises challenges, including the potential reduction of human interaction, digital accessibility issues, and concerns regarding data privacy. As AI continues to evolve, its potential to further transform English language learning is undeniable, but careful consideration of these challenges is necessary to ensure equitable and effective implementation in diverse educational contexts. For future research, exploring the long-term effects of AI on language proficiency, its role in fostering intercultural communication, and the ethical implications of its use will be essential in shaping the future of AI-enhanced language education.

This study highlights a need to prepare English language teachers to have an understanding of what AI is, how to exploit the many benefits of these tools with English learners and knowledge of what to avoid. It is important to note the limitations of this study that only studies published in English were included in this study. Examination of further databases may also provide further data. This study can be used as a springboard for future researchers to address the gaps highlighted to provide further depth into AI and ELT/L. Policy makers, funders, practitioners and educational leaders can use the information provided in this study to gain a holistic understanding of the current trend in the use of AI in ELT/L.

Understanding AI and IT is essential for advancing the study and teaching of the English language in the modern era. These technologies offer personalized learning experiences, enhance pedagogy, improve accessibility, and facilitate global communication. For researchers, AI/IT provides powerful tools for analyzing language acquisition, developing new methodologies, and addressing ethical considerations. By embracing AI/IT, educators and researchers can revolutionize English language education, making it more effective, inclusive, and adaptable to the needs of a diverse, globalized world.

REFRENCES

[1]. Ahmadi, M. R. (2018). The use of technology in English language learning: A literature review. International Journal of Research in English Education, 3(2), 115–125.
[2]. Annamalai, N., Eltahir, M. E., Zyoud, S. H., Soundrarajan, D., Zakarneh, B., & Al Salhi, N. R. (2023). Exploring English language learning via chabot: A case study from a self determination theory perspective. Computers and Education: Artificial Intelligence, 5, 100148.
[3]. Baranwal, D. (2022). A systematic review of exploring the potential of teachable agents in English learning. Pedagogical Research, 7.
[4]. Belur, J., Tompson, L., Thornton, A., & Simon, M. (2018). Interrater reliability in systematic review methodology: Exploring variation in coder decision-making. Sociological Methods & Research.
[5]. Bozkurt, A., Xiao, J., Lambert, S., Pazurek, A., Crompton, H., Koseoglu, S., Farrow, R., Bond, M., Nerantzi, C., Honeychurch, S., Bali, M., Dron, J., Mir, K., Stewart, B., Costello, E., Mason, J., Stracke, C. M., Romero-Hall, E., Koutropoulos, A., … Jandrić, P. (2023). Speculative futures on ChatGPT and generative artificial intelligence (AI): A collective reflection from the educational landscape. Asian Journal of Distance Education, 18(1), 53–130.
[6]. Çakmak, F. (2022). Chatbot-human interaction and its effects on EFL pupils' L2 speaking performance and anxiety. Novitas-ROYAL (Research on Youth and Language), 16(2), 113–131.
[7]. Chen, C.-H., Koong, C.-S., & Liao, C. (2022). Influences of integrating dynamic assessment into a speech recognition learning design to support pupils' English speaking skills, learning anxiety and cognitive load. Educational Technology & Society, 25(1), 1–14.
[8]. Chen, T. (2016). Technology-supported peer feedback in ESL/EFL writing classes: A research synthesis. Computer Assisted Language Learning, 29(2), 365–397.
[9]. Chen, Y.-L., Hsu, C.-C., Lin, C.-Y., & Hsu, H.-H. (2022). Robot-assisted language learning: Integrating artificial intelligence and virtual reality into English tour guide practice. Education Sciences, 12, 437.
[10]. Chon, Y. V., Shin, D., & Kim, G. E. (2021). Comparing L2 learners' writing against parallel machine-translated texts: Raters' assessment, linguistic complexity and errors. System, 96, 102408.
[11]. Crompton, H., & Burke, D. (2020). Mobile learning and pedagogical opportunities: A configurative systematic review of PreK-12 research using the SAMR framework. Computers & Education, 156, 103945.
[12]. Crompton, H., Jones, M. V., & Burke, D. (2022). Affordances and challenges of artificial intelligence in K-12 education: A systematic review. Journal of Research on Technology in Education.
[13]. Gilakjani, A. P. (2017). A review of the literature on the integration of technology into the learning and teaching of English language skills. International Journal of English Linguistics, 7(5), 95–106.
[14.] Godwin-Jones, R. (2018). Contextualized vocabulary learning. Language Learning & Technology, 22(3), 1–19.
[15]. Grabe, W. P., & Stoller, F. L. (2002). Teaching and researching reading. Pearson Education.
[16]. He, Y. (2021). Challenges and countermeasures of translation teaching in the era of artificial intelligence. Journal of Physics: Conference Series 1881, 2, 022086.
[17]. International Society for Technology in Education (ISTE). (2018). Artificial intelligence explorations and their practical use in schools.
[18]. Xiaohong, W., & Yanzheng, W. (2021, February). The application of artificial intelligence in modern foreign language learning. In Proceedings of the 2021 4th International Conference on Big Data and Education (pp. 34–37). ACM.