A NARRATIVE REVIEW OF AI, VIRTUAL REALITY, MOBILE LEARNING, AND LEARNING MANAGEMENT SYSTEMS IN ENGLISH LANGUAGE TEACHING (ELT)

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Abstract

This research paper aims to conduct a narrative literature review about new technologies that can be applied to English language teaching (ELT) and to find out the answer to the research question, "Which innovative English language teaching (ELT) technologies are available for use in teaching and learning?" The benefits of this study can enhance the area of teaching and learning outcomes for educators and learners. This study reviewed 30 publications related to the use of technological tools for teaching English in the Elsevier database in the years 2023 to 2024. The study follows a systematic and narrative literature review (NLR) approach, guided by the JBI Manual for Evidence Synthesis and PRISMA-ScR frameworks. The researchers found that the essential and effective tools for teaching and learning English include artificial intelligence (AI) and machine learning (ML) technologies, Internet of Things (IoT) technologies, virtual reality (VR) technologies, interactive and multimedia technologies, computational thinking and natural language processing (NLP) technologies, and mobile and digital learning tools. Those technologies can help students to get more engagement, provide opportunities for their self-regulated learning, and make better learning outcomes.

Keywords: ELT technologies, AI, VR, IoT, mobile learning, interactive technologies, NLP.

Introduction

The COVID-19 epidemic has fundamentally changed educational strategies, therefore altering learning environments and instructional approaches as well (Lou, Zou, & Kohnke, 2024). Educational institutions have extensively embraced hybrid and remote classrooms, providing flexibility and access for both professors and students, with the trend toward digital learning. This shift has sped up the integration of technology into education, so digital tools are now indispensable for good instruction and learning. Aiming to increase student involvement and learning outcomes, many disciplines are actively investigating technological innovations to enhance their pedagogical strategies, beyond facilitating online and offline learning (Annamalai, Uthayakumaran, & Zyoud, 2023; Hung Lin, Yu, & Sun, 2023; Khodabandeh, 2023).

For teaching English in university, technology helps teachers and learners to perform their tasks more effectively. Technology enhances English Language Teaching by improving students' speaking fluency through AI-based chatbots, refining writing skills with NLP tools, and supporting listening comprehension via VR-based learning environments. As Catoto (2024) stated, technology can greatly draw attention from students to interest in subjects, make them understand the lessons more, and improve students' communication abilities, especially writing and reading. Design content and classroom activities; teachers must focus on selecting teaching media that help students master the target language through experiences that stimulate learning and skills in order to be able to apply knowledge to maximum benefit.

This study used a narrative literature review (NLR) to collect and analyze data by selecting research published in a reliable database such as Elsevier between 2023-2024 that is modern research. Our methodology is "systematic and narrative" (Greenhalgh et al., 2018), chosen to encapsulate our objective of discovering various facets and elements of new technology in English language teaching. The searches were methodical to guarantee comprehensiveness in collecting and evaluating findings due to the extensive scope of our evaluation and the substantial volume of possibly pertinent literature. Our review did not adhere to the stringent evaluation and synthesis of data characteristic of a systematic review. Our literature review is narrative as it provides an academic summary accompanied by interpretation and critique of the overarching notion of well-being. We opted against conducting a scoping review (Peters et al., 2020) due to the substantial volume of evidence generated by our systematic searches. A NLR does not comprehensively encompass the entire body of evidence; it seeks to select and extract full-text items that offer a maximum range of insights pertinent to the subject of new technology in English language teaching. (Greenhalgh, 2018). Summarize it as up-to-date and reliable knowledge (Dowlut & Gobin-Rahimbux, 2023). This study aims to conduct a narrative literature review on the application of new technologies in English Language Teaching (ELT), focusing on their effectiveness,

challenges, and best practices. By analyzing recent research from 2023–2024, this study provides insights into how technologies such as Artificial Intelligence (AI), Virtual Reality (VR), the Internet of Things (IoT), and mobile learning tools enhance different aspects of ELT, including speaking, writing, assessment, and student engagement. The findings will help scholars and educators understand the role of emerging technologies in designing effective and innovative teaching strategies in ELT.

Literature review

Technology-enhanced teaching innovation

By including digital tools into conventional teaching strategies, information and communication technology (ICT) has fundamentally changed education. Although ICT was once mostly utilized to enhance classroom learning, its use has grown to support interactive and innovative teaching strategies. Grandstand & Holgerson (2020) go over the history of invention and underline how instructional approaches have been always shaped by technology developments. Understanding the development of technology-enhanced learning in ELT depends on this historical viewpoint since the acceptance of digital technologies in language education marks a more general change toward educational innovation. These days, especially in ELT, ICT forms the basis for technological-enhanced educational innovation. Liu & Zhang (2024) underline that delivering successful learning outcomes mostly depends on instructors' capacity to properly integrate technology. ELT is clearly showing this integration as creative tools such artificial intelligence (AI), virtual reality (VR), and mobile learning apps are used to improve language acquisition (Avelar, Borges-Tiago, Almeida & Tiago, 2024). Through interactive and individualized learning experiences, these technologies not only assist skill development in speaking, writing, and comprehension but also student involvement. Furthermore, the change toward technology-driven ELT is about developing an educational attitude that welcomes creativity as much as about using digital tools. Teachers have to evaluate these technologies objectively and modify their teaching strategies to best enhance learning results (Liu & Zhang, 2024). Understanding the historical trajectory of technological progress in education helps teachers to decide how best to include ICT in ways that fit the changing demands of language learners**.**

Methodology

Following Greenhalgh et al. (2018) and the JBI Manual for Evidence Synthesis (2021), this study conducts a systematic and narrative literature review (NLR). The systematic approach selects literature in a structured manner, while the narrative component critically interprets and synthesizes data to reveal technology's usefulness, problems, and best practices in ELT. Our study analyzes a variety of research approaches, making a narrative

synthesis more suited than a meta-analysis, which requires homogeneous data sets for statistical evaluation. Since we summarized knowledge rather than doing primary research, an empirical investigation was not possible. A scoping review was a possibility, but the enormous amount of material required a more structured synthesis, making the systematic and narrative approach best. The paper presents findings systematically using PRISMA-ScR (Tricco et al., 2018). Our review makes an effort to locate, evaluate, and compile the body of research on the use of technology in English instruction and learning. Our method involves five steps (Arksey & O'Malley, 2005; Chong, Lin, & Chen, 2022):

Step 1: Defining the objectives and research questions

This article's objective is to conduct a systematic review of new technologies in English language teaching (ELT).

Research question: Which innovative English Language Teaching (ELT) technologies are available for use in teaching and learning?

Step 2: Selecting keywords, databases, and inclusion and exclusion criteria

Keywords for searching are "teaching English" and "technology". Systematic literature reviews were found in the Elsevier database in 2023-2024 after a thorough search of the systematic literature reviews published in renowned worldwide publications. The Elsevier database was chosen since its published articles are included in Scopus. Researchers can plan their research and make decisions by using Scopus data, which is a reliable source.

The evidence's sources are deemed acceptable according to their publishing type, language, and years of publication. For the research findings to be current in relation to contemporary technology, the papers must be published in 2023-2024. Research articles alone written in the English language are required.

During the screening process, certain exclusion criteria were taken into account. Publications that do not concentrate on using technology to teach English are also excluded because they are outside the purview of this investigation. To prevent content duplication, preprints of published work that were already included in the record were also eliminated. The study publications, for which the entire text is not available to me. Lastly, conference papers, review articles, encyclopedias, and book chapters are not included in this analysis.

Step 3: Searching databases for keywords and screening preliminary results

There are 3,863 articles after using keywords "Teaching English and technology" in the Elsevier database in 2023-2024 (searching in the database on May 25, 2024). However, the majority of research articles are about teaching English, technology, or each type of technology for teaching separately but do not focus on teaching English.

Step 4: extracting pertinent materials and evaluating study quality

Data extraction was arranged for consistency and completeness. A data extraction form was used to review each study and note key information. Study title, author(s), publication year, research aims, methodology, significant findings, and relevance to ELT

technology effectiveness, problems, or best practices were retrieved. After two independent researchers extracted, inconsistencies were discussed to improve reliability. There are 30 publications that examined the use of technological tools for teaching English that may be used for analysis in this study.

Table 1 List of research articles

	Name of journal	Research topics
Yang et al. (2024)	Teaching and Teacher Education	Enhancing teachers' self-efficacy beliefs in AI-based technology integration into English- speaking teaching through a professional development program.
Wang et al. (2024)	Measurement: Sensors	Application of IoT audio technology based on sensor networks in English-speaking teaching systems.
Al-khresheh (2024)	Computers and Education: Artificial Intelligence	Bridging technology and pedagogy from a global lens: Teachers' perspectives on integrating ChatGPT in English language teaching
Li (2024)	Entertainment Computing	Simulation of e-learning in English learner writing teaching based on natural language processing and machine learning algorithms
Yuxiu (2024)	Systems and Soft Computing	Application of translation technology based on AI in translation teaching
Du & Daniel (2024)	Computers and Education: Artificial Intelligence	Transforming language education: A systematic review of AI-powered chatbots for English as a foreign language speaking practice
Moorhouse & Kohnke (2024)	System	The effects of generative AI on initial language teacher education: The perceptions of teacher educators
Parker et al. (2024)	Computers and Education Open	Graduate instructors navigating the AI frontier: The role of ChatGPT in higher education
Liang & Hwang (2024)	Computers & Education	A robot-based digital storytelling approach to enhancing EFL learners' multimodal storytelling ability and narrative engagement
Yu et al. (2024)	Thinking Skills and Creativity	How to learn and teach a foreign language through computational thinking: Suggestions based on a systematic review
Zhang & P´erez-Paredes	Systems	Chinese EFL learners' use of mobile dictionaries in reading comprehension tasks

	Name of journal	Research topics
(2024)		
Zhang & Huang (2024)	Heliyon	The impact of chatbots based on large language models on second language vocabulary acquisition
Hsu (2024)	Heliyon	Exploring EFL learners' acceptance and cognitive absorption at VR-Based Language Learning: A Survey and Experimental Study
Zheng & Stewart (2024)	Computers and Education: Artificial Intelligence	Improving EFL students' cultural awareness: Reframing moral dilemmatic stories with ChatGPT
Mohammadi (2024)	Heliyon	University students' academic vocabulary development through mobile-assisted learning: Exploring the impacts on receptive and productive knowledge
Steiss et al. (2024)	Learning and Instruction	Comparing the quality of human and ChatGPT feedback on students' writing
Li et al. (2024)	Acta Psychologica	The effect of computer self-efficacy on the behavioral intention to use translation technologies among college students: Mediating role of learning motivation and cognitive engagement
Xu (2023)	Entertainment Computing	Design and application of VR-based college English game teaching
Nie (2023)	Entertainment Computing	College English teaching reform and innovative methods under the new media platform based on the IoT
Liu (2023)	Journal of English for Academic Purposes	Specialized vocabulary in TED talks and TED-Ed animations: Implications for learning English for science and technology
Luo et al. (2023)	Heliyon	The SeeWo interactive whiteboard (IWB) for ESL teaching: How useful is it?
Ericsson & Johansson (2023)	Computers and Education: Artificial Intelligence	English speaking practice with conversational AI: Lower secondary students' educational experiences over time
Annamalai et al. (2023)	Computers and Education: Artificial Intelligence	Using chatbots for English language learning in higher education
Ericsson &	Computers and	English speaking practice with conversational AI: Lower

	Name of journal	Research topics
Johansson (2023)	Education: Artificial Intelligence	secondary students' educational experiences over time
Warschauer et al. (2023)	Journal of Second Language Writing	The affordances and contradictions of AI-generated text for writers of English as a second or foreign language
Praphan & Praphan (2023)	Journal of Second Language Writing	AI technologies in the ESL/EFL writing classroom: The villain or the champion?
Shukla et al. (2023)	Natural Language Processing Journal	An evaluation of Google Translate for Sanskrit to English translation via sentiment and semantic analysis
Barrot (2023)	Assessing Writing	Using ChatGPT for second language writing: Pitfalls and potentials
Chigbu et al. (2023)	Heliyon	Enhancing ESL students' academic achievement in expository essay writing using digital graphic organisers: A mixed-methods research
Colognesi et al. (2023)	Teaching and Teacher Education	Improving the oral language skills of elementary school students through video-recorded performances

Step 5: Synthesizing, interpreting, and presenting findings

In the social sciences and humanities, thematic analysis is a method that is widely used with written texts (McMillan, 2000; Creswell, 2012). Using the study questions as a guide, the two authors first independently and separately coded the pertinent content. We produced a series of codes that said things like "technology for English language learning," "Learning involved in the ChatGPT," and "using the AR, VR as teaching tool." Triangulation was also used in this work (Patton, 2002); the authors compared the contents and made any necessary adjustments.

Results and discussion

By analyzing those articles, we found that a variety of technology can enhance and supplement teaching activities. The categorization of technologies was conducted using thematic analysis, grouping them into learning enhancement tools, interactive learning environments, and automated assessment systems.

1. Learning Enhancement Tools and Automated Assessment Systems

1.1 Artificial Intelligence (AI) and Machine Learning (ML) Technologies

In the past, learning a new language often involved attending classes, working through textbooks, and practicing with native speakers. While these methods are effective, they often require a great deal of time, effort, and financial resources. The rise of the

Internet and digital technology has opened up new opportunities for language learners. Online courses, language exchange platforms, and mobile apps have made learning more accessible and convenient. However, AI is taking language learning to the next level. Artificial intelligence (AI) and machine learning (ML) technologies are potential tools for improving teaching and learning (Warschauer et al., 2023). AI and ML-driven professional development teaching and learning programs can help teachers improve classroom activities and language skills (Moorhouse & Kohnke, 2024), increasing student engagement and teaching effectiveness (Li et al., 2024). AI in language learning is the ability to create personalized learning experiences. AI can analyze learners' strengths and weaknesses, allowing apps to tailor content and difficulty levels to individual needs. ChatGPT4.0 is one of the next generations of AI (Al-Khresheh, 2024). Learners will be able to use ChatGPT to help with English grammar, sentence construction, and vocabulary, to improve conversational fluency. Chatbots built on large language models can enhance vocabulary learning and language practice (Colognesi et al., 2023; Li et al., 2024; Zheng & Stewart, 2024; Steiss et al., 2024; Parker et al., 2024). Chatbots built on large language models enhance vocabulary learning and language practice. In case of Automated Assessment Systems, Zhang and Huang (2024), Annamalai et al. (2023), and Ericsson and Johansson (2023) found that chatbots provide real-time feedback and personalized advice. For example, Quillbot is a tool that integrates the capabilities of Artificial Intelligence (AI) into English writing assistance, including grammar checks, vocabulary suggestions, and more.

1.2 Mobile and Digital Learning Tools

Anki's digital flashcards are mobile-assisted learning tools. It can improve students' vocabulary knowledge (Mohammadi et al., 2024). Zhang & Pérez-Paredes (2024) found that mobile dictionaries provide fast access to definitions and translations. Hence, it improves reading comprehension and vocabulary acquisition for individual learning. In addition, Chigbu et al. (2023) found the method that helps students write instruction by using digital graphic organizers (DGOs).

In the case of improving oral communication skills, video-recorded performances are an effective tool for self-assessment and peer feedback (Colognesi et al., 2023). The instructors and learners can identify areas for improvement, and the students themselves can track their progress over time.

1.3. Computational Thinking and Natural Language Processing (NLP) technologies

NLP technology is a branch of computer science and an AI technology that involves enabling computers to interpret and understand human language. It is important for analyzing data, text, and speech effectively. It can work by distinguishing differences in dialects, slang, and the use of grammar that is different from normal conversation (Yu et al., 2024). NLP technologies such as machine translation and AI-generated text generators can

help students improve their writing skills (Praphan & Praphan, 2023). Machine translation, such as Google Translate, is an example of NLP technology that is widely used today. It is not just about translating from one language to another, but effective translation must be able to correctly interpret and understand the tone of the input language. NLP algorithms can recognize and correct writing errors and provide real-time feedback (Shukla et al., 2023; Zheng & Stewart, 2024; Zhang & Pérez-Paredes, 2024). In addition, for specific languages such as Sanskrit, Google Translate is a powerful tool for translating Sanskrit to English. It can handle complex texts and cultural differences (Shukla et al., 2023)

2. Interactive Learning Environments

2.1 Internet of Things (IoT) Technologies and Automated Assessment Systems

Applications to help create experiences or present information in situations outside the classroom Informal learning environment to improve interactive learning The use of voice technology Internet of Things (IoT) in education makes blended teaching methods easier to apply. The interaction between teachers and students using Internet of Things (IoT) technology can increase real-time interaction (Colognesi et al., 2023; Wang et al., 2024). New media platforms seamlessly integrate online and offline activities, thus supporting a variety of teaching methods and improving teacher-student interaction (Li et al., 2024). IoT technology can also enable instructors and students to efficiently monitor and track development and academic achievement by means of smart tags tracking of student learning activities, attendance, or applications tracking of academic success and lesson organization (Nie, 2023). For this advantage, it improves as automated assessment systems

2.2 Virtual Reality (VR) Technologies

Research has shown that VR supports self-directed learning and individualizes learning. There are two types of VR applications for teaching and learning processes. The first application is VR game teaching and the second application is VR language learning. Students who use VR game teaching can practice their language skills, making students feel immersed and engaged. Hsu (2024) stated that VR games create a realistic learning environment that simulates real-life situations. VR game teaching helps students build confidence by helping them develop their speaking and listening skills. Students can practice their language skills without fear of making mistakes, so they are in a simulated environment with less anxiety.

Xu (2023) stated that VR makes the learning process more fun and effective. It helps learners to experience different cultural environments (Hsu, 2024). VR language learning is an active learning tool or a teaching process that emphasizes learners to participate and interact with learning activities through practice, such as virtual tours and role-playing, which allow learners to experience interactive experiences. Designed to enhance language learning, VR activities such as virtual tours, role-playing scenarios, and interactive storytelling give learners the opportunity to practice their language (Hsu, 2024).

Research supports that kinesthetic learning enhances retention more effectively than traditional learning methods, and VR further strengthens vocabulary retention by allowing learners to apply words in real-life contexts rather than relying solely on memorization (Globish Education, 2022). In addition, the use of Gamification in language teaching via VR has a positive effect on learners in terms of motivation to learn and allows learners to easily enter the Flow State or flow with learning. In addition to increasing learning efficiency, the use of VR in teaching English can also help reduce learners' panic when having to give a speech (Globish Education, 2022).

1.3 Interactive and Multimedia Technologies

Multimedia and interactive technologies such as Digital Graphic Organizers (DGOs), Interactive Whiteboards (IWBs), digital storytelling, video recordings of performances, and specialized language in TED talks and TED-Ed animations are interesting ways to enhance student learning.

DGOs can enhance students' essay writing skills by providing visual frameworks, sketches, and editing of essays, helping students produce higher-quality writing. IWBs are tools for facilitating multimedia presentations and interactive activities. Interactive whiteboards (IWBs) is the modern whiteboards, which are integrated with projectors and computers, allow for communication and interaction between the computer and the images displayed on the board with an electronic pen device. (Luo et al., 2023; Chigbu et al., 2023).

For digital storytelling, Liang & Hwang (2024) stated that this tool is for creating multimedia stories and motivating students to design creative digital story presentations. Students can develop their language skills, creativity, and analytical thinking. Video-recorded performances are a specific tool for oral communication. This technology allows learners to self-assess and provide suggestions for improvement (Colognesi et al., 2023).

In the case of vocabulary learning and comprehension, TED presentations and TED-Ed animations, a web application for creating lessons in the form of interactive video, by adding additional information to the video and generating a set of questions, can introduce learners to contextual language, promote critical thinking, and listening skills (Liu, 2023).

Implementation and recommendation

Teaching English can integrate those technologies into learners' activities. The instructors themselves can provide and guide students to use technology for improving their learning activities. The students themselves can enhance their self-directed learning by applying those tools to their learning experience. Those tools can increase the language proficiency.

Mastering a new language is an exciting journey, and mobile learning apps are one of the trusty guides. These apps have transformed language acquisition, making it more accessible and engaging. Whether a beginner user or the one who looks to polish his/her

skills, there's an app designed to cater to any linguistic needs. Mobile-assisted learning applications like Anki and Duolingo can help students practice their language abilities whenever and wherever they want. These apps provide immediate feedback for grammar checking, enabling learners to correct mistakes immediately and improve their understanding of grammatical concepts.

Grammarly, QuillBot, Google Translate, and ChatGPT are among AI-driven English language learning applications that help students raise their writing, grammar, and general language competency. Google Translate helps with word and phrase translation; Grammarly and QuellBot help with grammatical verification, syntax improvement, and paraphrasing. When utilized under appropriate instructor direction, these technologies offer individualized feedback that helps students create clear, efficient writing styles. AI-powered chatbots also help students practice languages by means of real-time interactions, therefore improving fluency via ongoing contact. Their availability lets students practice whenever, therefore providing a flexible, student-centered method of language acquisition outside of conventional classroom environments.

Virtual reality (VR) offers immersive learning experiences by replicating real-world scenarios like supply chain management and warehouse management. In a regulated environment, these simulations can improve language acquisition and comprehension of concepts and ideas by offering real-world language exercises. IWBs let students present multimedia content, conduct group discussions, and leading activities. It fosters improved classroom dynamics by encouraging student participation and engagement in the classroom. Teachers can motivate students by providing exercises about grammar and vocabulary while promoting collaborative learning among students in the classroom.

DGOs assist students in writing assignments by structuring their ideas and thoughts. Students can write essays and create graphically organized tasks. DGOs assist a coherent flow of ideas, simplify complicated data and processes in language study, as well as enhance the transfer of technical knowledge.

Conclusion

This study systematically reviewed the role of AI, VR, IoT, NLP, and mobile learning in ELT, highlighting their benefits in engagement, personalized learning, and skill development. However, challenges such as accessibility, teacher readiness, and ethical concerns remain. A key takeaway is the need for comprehensive teacher training to enhance digital literacy and pedagogical adaptation. Successful integration of technology in ELT depends on structured implementation, continuous training, and ongoing research to maximize its effectiveness in language education.

Suggestions for further research

The integration of technology in English Language Teaching (ELT) can enhance learning for undergraduate students; yet, some problems necessitate further research to fully optimize the students' potential. It is essential to examine the long-term impacts of technologies such as virtual reality, mobile-assisted learning, and artificial intelligence-based applications on language proficiency. Moreover, to maximize the potential of technology, it is essential to identify the challenges and barriers faced by educators and learners. Furthermore, research should focus on tailoring ELT technology to diverse learning styles through personalized feedback and adaptive learning algorithms. By resolving these issues, ELT methodologies in higher education will become more effective, inclusive, and sustainable.

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