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# Artificial Intelligence (AI) Tools and Learning Strategies for English Literacy: A Systematic Literature Review

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**Abstract**

Artificial intelligence (AI) is reshaping educational methodologies, particularly in English literacy. This systematic literature review explores how AI tools are being integrated into English language learning, focusing on innovative strategies to overcome limitations in traditional approaches. Guided by the PRISMA framework, the review analysed 16 primary studies published between 2022 and 2024 across databases such as Scopus and Web of Science. The findings are synthesised into three overarching themes: AI in Language Learning and Teaching, AI for Accessibility and Specialised Learning, and AI Integration in Educational Platforms and Tools. The review reveals that AI-powered tools such as ChatGPT, Grammarly, and Prompty provide personalised learning experiences and real-time feedback. These features significantly enhance students' writing proficiency, critical thinking, and engagement. These findings are substantiated across multiple studies using diverse methodologies. Moreover, the integration of AI has facilitated inclusive education by supporting learners from varied linguistic and geographical backgrounds, including non-native speakers and students with special learning needs. Tools such as AI translation systems and multimodal storytelling platforms have demonstrated increased accessibility and adaptability. In addition, AI platforms have proven effective in automating educational processes, improving instructional delivery, and enabling adaptive learning environments. However, the review also highlights challenges such as overreliance on AI, ethical considerations, and the need for digital literacy among educators and students. The study concludes by emphasising the transformative potential of AI in English literacy education and calls for further research into responsible and equitable integration practices. Insights are offered for educators and policymakers to guide future implementation.

**Keywords**: Artificial Intelligence in Education, Artificial Intelligence Tools, Learning Strategies, English Literacy

## Introduction

In recent years, the integration of Artificial Intelligence (AI) into educational frameworks has revolutionized the landscape of teaching and learning. Among the various academic disciplines, English literacy stands out as a crucial area where AI tools and learning strategies are making significant inroads. The advent of AI in education brings forth unprecedented opportunities for personalized learning, enhanced engagement, and improved educational outcomes (Popenici & Kerr, 2017). This article explores the intersection of AI tools and innovative learning strategies in the realm of English literacy, highlighting how these technologies can transform traditional educational paradigms. Artificial Intelligence, characterized by its ability to mimic human intelligence and perform tasks such as understanding natural language, recognizing patterns, and making decisions, has seen widespread adoption in various sectors (Alainati et al., 2023). In education, AI's potential is being harnessed to address some of the longstanding challenges, such as catering to diverse learning needs, providing real-time feedback, and automating administrative tasks. AI's capacity to analyze vast amounts of data and generate insights allows for the development of adaptive learning environments that respond to the unique needs of each student.

One of the most significant contributions of AI to English literacy is the facilitation of personalized learning experiences. Traditional classroom settings often struggle to meet the individual needs of every student due to time constraints and limited resources. AI-powered tools, however, can assess a student's proficiency level, learning style, and progress, subsequently tailoring instructional content to suit these parameters. For instance, AI-driven platforms like Grammarly and Quill provide customized feedback on writing assignments, helping students improve their grammar, vocabulary, and overall writing skills (Fauziah & Minarti, 2023; Kaharuddin et al., 2024). These platforms analyze each student's work in real-time, offering suggestions that are specific to their errors and learning patterns. Engagement and motivation are critical components of effective learning. Cossich et al., (2023) AI tools enhance these elements by incorporating interactive and gamified learning strategies. Language learning apps such as Duolingo utilize AI to create engaging, game-like experiences that motivate students to practice English regularly. These apps adapt to the learner's pace and performance, ensuring that the content remains challenging yet achievable.

The traditional methods of assessment often involve delays and a lack of specificity in feedback, which can hinder student progress. AI addresses these issues by providing real-time, detailed feedback that helps students understand their strengths and areas for improvement. Tools like Turnitin not only check for plagiarism but also offer insights into writing style, coherence, and argumentation. Such immediate feedback allows students to make corrections and learn from their mistakes promptly, fostering a continuous improvement cycle. AI tools also play a pivotal role in supporting teachers by automating routine tasks and enabling them to focus on more critical aspects of teaching. Automated grading systems, for example, save considerable time and reduce the workload on educators, allowing them to dedicate more time to personalized instruction and student interaction (Sağin et al., 2023). Furthermore, AI can assist in curriculum development by analyzing educational content and suggesting enhancements based on student performance data and learning trends. AI's natural language processing capabilities make it a powerful tool for breaking down language barriers and promoting inclusivity in education. AI-driven translation tools like Google Translate and Microsoft Translator help non-native English speakers comprehend and participate in English

literacy activities more effectively. These tools can translate text, speech, and even real-time conversations, making educational content accessible to a broader audience. This inclusivity ensures that all students, regardless of their linguistic background, have the opportunity to improve their English literacy skills (Kustini et al., 2020a).

The integration of AI in English literacy education is not merely a trend but a transformative shift that holds the promise of enhanced learning experiences, personalized instruction, and greater student engagement (Özdere, 2023). By leveraging AI tools, educators can provide tailored support to each student, fostering a more inclusive and effective learning environment. As AI technologies continue to evolve, their potential to revolutionize education, particularly in the realm of English literacy, will only expand, paving the way for more innovative and impactful teaching and learning strategies.

**Implications and Contributions of the Research**

This study underscores the pivotal role of artificial intelligence (AI) tools in revolutionizing English literacy education, particularly in addressing the challenges of personalized feedback and engagement in traditional learning settings. The systematic literature review reveals a significant gap in the current research, particularly the need for in-depth studies on the integration of AI technologies with adaptive learning strategies to enhance English literacy. This gap presents a crucial opportunity for future research to explore how AI can be seamlessly integrated into educational practices to provide tailored, interactive, and engaging learning experiences.

Moreover, the findings from this research offer valuable insights for the development of future AI-driven educational applications. By identifying effective AI tools and their alignment with specific learning strategies, this study provides a practical guide for educators and developers in creating AI-based educational tools that are not only technologically advanced but also pedagogically sound. The potential for AI to offer real-time, personalized feedback and adaptive learning pathways highlights its capacity to significantly improve student engagement and motivation.

In terms of broader educational implications, the study highlights the effectiveness of AI in fostering inclusive education. AI technologies can cater to diverse learner needs, providing equitable access to educational resources and overcoming geographical and linguistic barriers. This inclusivity is particularly important in ensuring that all students, regardless of their backgrounds, have the opportunity to enhance their English literacy skills.

In summary, this research positions AI as a transformative force in the realm of English literacy education. It not only sheds light on the current applications of AI in this field but also paves the way for future research and development efforts. By leveraging AI's potential to create personalized, adaptive, and engaging learning experiences, educators can better support students in mastering English literacy, ultimately fostering a more inclusive and effective educational environment. Specifically, this systematic literature review attempts to seek answers to the following research questions:

- How do AI-based tools impact the learning outcomes, engagement, and perceptions of students and teachers in English language learning and teaching contexts?

- How can AI-based systems enhance educational accessibility and specialized learning for students with diverse needs, and what are the challenges and benefits of implementing these technologies?
- How do AI-integrated educational platforms and tools impact language acquisition, comprehension, and overall learning satisfaction among students in various educational contexts?
- What pivotal research themes underpin the development and growth of artificial intelligence in English literacy education?

**Literature Review**

Integrating AI tools in education, especially for improving English literacy, has gained significant attention in recent research. Mudrik and Charles (2023), introduced the Multi-Lingual DALL-E Storytime framework, an innovative tool that enhances comprehension through visual storytelling. Unlike traditional text-to-image AI, it generates coherent image sequences that maintain narrative consistency, helping non-English speakers understand complex texts. This tool bridges educational gaps and promotes equal access to technology for diverse populations. Woerner et al., (2024), explore AI's transformative potential in education through higher education case studies. Their research shows how large language models like ChatGPT enhance learning environments. In computer science, ChatGPT improves programming education by introducing diverse problem-solving strategies, significantly boosting student engagement and understanding. Similarly, in English composition, AI helps develop writing skills, but the study emphasizes balancing AI assistance with human critical thinking to avoid overreliance. This highlights the broader ethical discussion on the responsible use of AI in education.

Moreover, AI tools like ChatGPT can help develop English literacy skills by providing real-time feedback and personalized learning experiences. They identify individual learning needs and adapt content, offering a more tailored educational approach. Woerner et al. (2024) stress the importance of combining AI with traditional teaching methods to improve the academic experience without replacing fundamental literacies. This ensures students benefit from AI's advanced capabilities while maintaining essential human oversight and interaction. AI-driven visualization and language models show promise for enhancing English literacy. Mudrik and Charles (2023) show that AI can enhance storytelling and narrative comprehension for non-English speakers, making learning more accessible. Concurrently, Woerner et al. (2024) discuss the practical uses and ethical considerations of AI in higher education, advocating for balanced integration with traditional literacies and critical thinking. These studies highlight AI's potential to transform education and create a more inclusive learning environment.

Implementing AI tools in education, especially for enhancing English literacy, has shown promising results. Dennison et al. (2024) discuss Prompty, an AI literacy tool for high school students that helps critically evaluate text generated by large language models like ChatGPT. A pilot study in a high school English class found Prompty effective in supporting writing practice and critical evaluation, indicating significant potential for AI in English literacy education. The tool's co-design with teachers ensures it meets educational needs and aligns with learning objectives, highlighting the importance of teacher involvement. Woerner et al. (2024) further explore AI's transformative impact in higher education through case studies,

showing how AI tools like ChatGPT improve writing skills in English composition classes. Their research underscores the need for a balance between AI assistance and human critical thinking to prevent overreliance on technology, advocating for AI to complement, not replace, traditional teaching methods to enhance the academic experience.

Alzubi (2024) examines the use of generative AI in English as a Foreign Language (EFL) writing, finding that students have a medium level of proficiency with these tools, indicating a need for better training. The survey and interview data show that while generative AI can enhance EFL writing skills, challenges remain in mastering these tools. The study recommends incorporating AI literacy into educational curricula and providing targeted training to help students use AI effectively in their language learning. Integrating AI literacy with traditional language instruction is crucial for improving overall proficiency. Mudrik and Charles (2023), introduced the Multi-Lingual DALL-E Storytime framework, which enhances comprehension through visual storytelling. Unlike traditional text-to-image AI, this tool generates coherent image sequences that maintain narrative consistency, benefiting non-English speakers by making learning more accessible. It helps bridge educational gaps by visualizing non-English texts, promoting equal access to technology and education, especially for children and those who struggle with complex narratives. The use of visual aids in learning is highlighted as a powerful tool for improving literacy and understanding. Lee et al. (2023) highlight how AI tools empower healthcare workers in Sierra Leone by providing educational support in low-literacy regions. AI tools like ChatGPT and Amazon Alexa answer health-related questions in English and Krio, showing how AI can be used beyond traditional classrooms. This demonstrates AI's versatility in addressing literacy and educational challenges in diverse contexts. The success of these tools emphasizes the need for adaptability and cultural relevance in designing AI educational technologies.

In summary, integrating AI tools in education, especially for English literacy, shows great potential. Tools like Prompty and Multi-Lingual DALL-E Storytime improve critical evaluation and comprehension skills, while generative AI aids EFL writing. Woerner et al., (2024) emphasize that blending AI with traditional teaching maximizes its benefits. The adaptability of AI tools to various educational needs, demonstrated in Sierra Leone, highlights the importance of cultural relevance and accessibility. These studies underscore AI's transformative potential in enhancing English literacy and promoting inclusive education.

## Methodology

*Identification*

Three fundamental stages of the systematic review process were utilized to select a large number of relevant publications for this study. In the first stage, keywords were chosen, and related terms were identified using thesauri, dictionaries, encyclopedias, and previous research. After creating search strings for the Scopus and Web of Science databases (see Table 1), all relevant keywords were selected. During this initial phase of the systematic review process, 854 publications were successfully retrieved from both databases for the current study.

Table 1
*The search string*

| | |
|---|---|
| **Scopus** | TITLE-ABS-KEY ( ( "Artificial Intelligence" OR ai ) AND tools AND learn* AND english ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) ) AND ( LIMIT-TO ( PUBSTAGE , "final" ) ) AND ( LIMIT-TO ( SRCTYPE , "j" ) ) AND ( LIMIT-TO ( LANGUAGE , "English" ) ) AND ( LIMIT-TO ( PUBYEAR , 2023 ) OR LIMIT-TO ( PUBYEAR , 2024 ) ) AND ( LIMIT-TO ( SUBJAREA , "COMP" ) )<br>Date Of Access : December 2024 |
| **WoS** | ( "Artificial Intelligence" OR ai ) AND tools AND learn* AND english (Topic) and 2024 or 2023 or 2022 (Publication Years) and English (Languages) and 2024 or 2023 (Publication Years) and 2024 or 2023 (Final Publication Year) and Article (Document Types) and Computer Science or Education Educational Research or Linguistics (Research Areas)<br>Date Of Access : December 2024 |

*Screening*

During the screening step, the collection of potentially relevant research items is evaluated for content that matches the predefined research questions. Frequently used content-related criteria in this phase include selecting research items based on Artificial Intelligence (AI) tools and learning strategies for English literacy. Duplicate papers are removed from the list during this step. In the first stage of screening, 759 publications were excluded, while the second stage evaluated 95 papers using various inclusion and exclusion criteria specific to this study (see Table 2). The primary criterion was literature (research papers), as it is the main source of practical recommendations. This also included reviews, meta-syntheses, meta-analyses, books, book series, chapters, and conference proceedings not covered in the most recent study. Additionally, the review was limited to publications in English and focused on the years 2022-2024. Overall, 5 publications were rejected due to duplication.

Table 2
*The selection criterion in searching*

| Criterion | Inclusion | Exclusion |
|---|---|---|
| **Language** | English | Non-English |
| **Time line** | 2023 – 2024 | < 2022 |
| **Literature type** | Journal, Conference | Book |
| **Publication Stage** | Final | In Press |
| **Subject Area** | Social Science, Linguistic and Education Research | Beside Social Science, Linguistic and Education Research |

*Eligibility*

In the third phase, known as the eligibility assessment, a collection of 90 articles was gathered. During this stage, the titles and main content of all the articles were carefully examined to ensure they met the inclusion criteria and were relevant to the study's research objectives. Consequently, 74 articles were excluded because they were either out of the field, their titles were not significant, their abstracts were unrelated to the study's objectives, or full-text access was not available. As a result, 16 articles were retained for the subsequent review.

*Data Abstraction and Analysis*

An integrative analysis was employed as one of the assessment strategies in this study to examine and synthesize various research designs, including quantitative, qualitative, and mixed methods. The aim was to identify relevant topics and subtopics. The initial step in developing the themes was the data collection stage. As shown in Table 3, the authors meticulously analyzed a compilation of 16 publications for assertions or material pertinent to the current study's topics. Subsequently, the authors evaluated significant studies related to AI tools in language learning and teaching, investigating the methodologies and research results used in these studies. The authors then collaborated with co-authors to develop themes based on the evidence in this study's context. Throughout the data analysis process, a log was kept to record any analyses, viewpoints, puzzles, or other thoughts relevant to data interpretation. Finally, the authors compared the results to identify any inconsistencies in the theme design process. In case of any disagreements between concepts, the authors discussed them among themselves, and the themes were adjusted to ensure consistency. To ensure the validity of the problems, the examinations were performed by two experts, one specializing in artificial intelligence and the other in English subject. The expert review phase helped ensure each sub-theme's clarity, importance, and adequacy by establishing domain validity. Adjustments based on the discretion of the author based on feedback and comments by experts have been made.

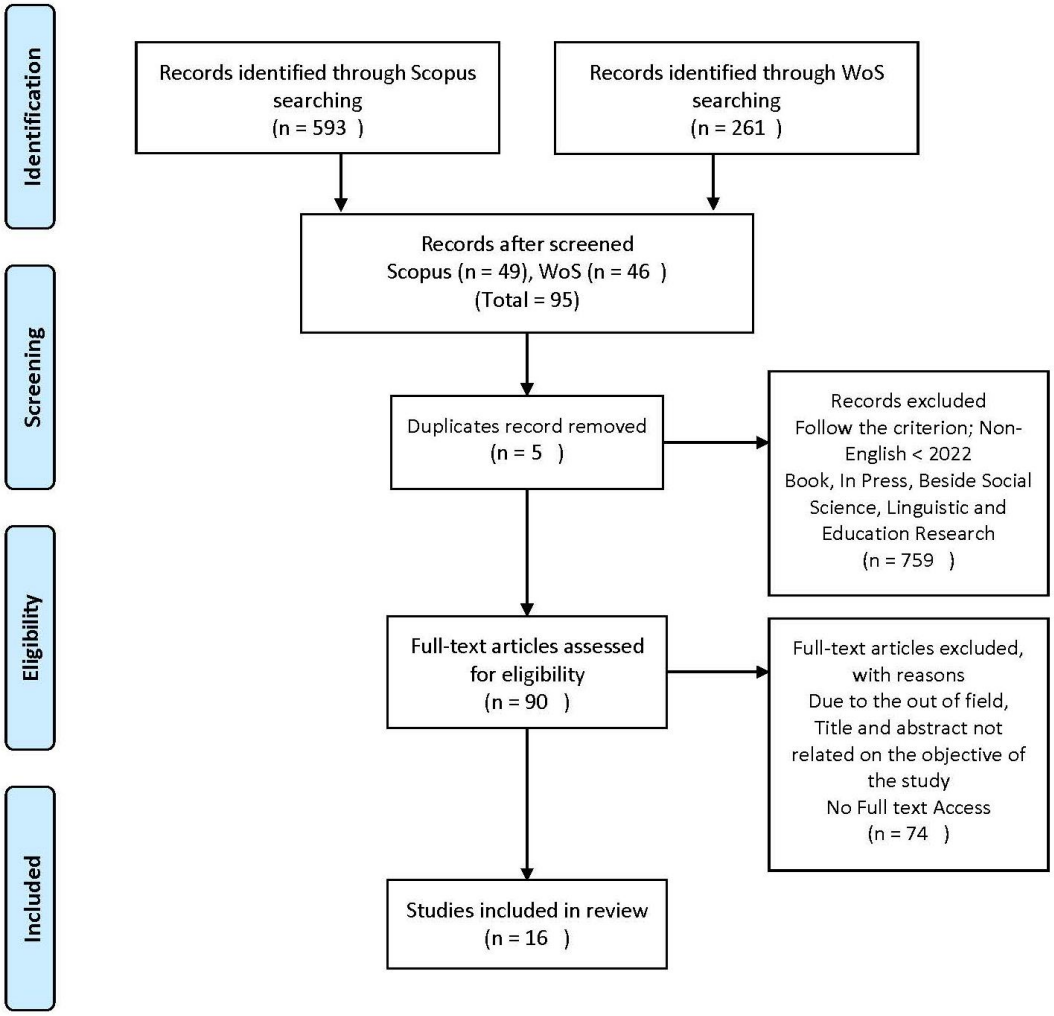


Figure 1. Flow diagram of the proposed searching study (Moher et al., 2009; Mustafa et al., 2022)

Table 3
*Findings of the study*

| No. | Study | Methodology | Learning Outcomes | Accessibility And Specialized Learning | Impact Language Acquisition | Learning Strategies | AI Tools |
|---|---|---|---|---|---|---|---|
| 1 | (Alzubi, 2024) | Descriptive-survey method (278 respondents, 30-item questionnaire, 3 interviews) | Medium level of generative AI literacy in EFL writing | No significant impact based on specialization | Enhanced overall learning and writing experience | Training courses, gaining experience in both English and AI | ChatGPT |
| 2 | (Korosidou & Bratitsis, 2019) | Pre/post test, interviews, 5th grades students. | Improved vocabulary, collaborative skills, intercultural understanding. | Equal participation, benefits for all students | Enhanced learning, vocabulary acquisition, communicative competence | Multimodal tools, digital storytelling, collaborative writing, critical discussions. | Not mentioned |
| 3 | (Dennison et al., 2024) | Pre/post test, 2 classes, 14-16-year-olds | Improved critical evaluation and AI literacy skills | Equal participation, accessible to all students | Enhanced critical thinking, writing skills | Use of AI literacy tools, multimodal approaches | Prompty |
| 4 | (Mudrik & Charles, 2023) | Experiments with varied text inputs, analysis, Total samples not specified | Improved AI model performance, effective multilingual visualization | Enhanced access to non-English texts for children | Improved understanding of narratives and songs | Multimodal DALL-E tool, storytelling, context integration | DALL-E |
| 5 | (Liu et al., 2024) | Survey, interviews, thematic analysis, 867 participants | Improved critical evaluation, AI literacy | Enhanced access, equal participation | Enhanced critical thinking, writing skills | AI tools, multimodal approaches | GPT (Chinese Version) |
| 6 | (Woerner et al., 2024) | Case study experiments, university participants | Improved engagement, critical thinking | Increased access, diverse needs | Enhanced writing skills, comprehension | AI tools, interactive methods | ChatGPT |
| 7 | (Krange et al., 2023) | Design-based experiment, 56 participants 8th grades students | Improved writing skills, assessment literacy | Enhanced feedback interpretation | Improved error correction, comprehension | AI tools, collaborative feedback | Essay Assessment Tool (EAT) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 8 | (Ahiara et al., 2023) | Exploratory data analysis, 37 states in Nigeria | Interest in ChatGPT, AI tools | Awareness across socioeconomic strata | Enhanced understanding, digital literacy | Use of AI, data analysis | ChatGPT |
| 9 | (Dwivedi et al., 2023) | Case studies, 43 experts | Productivity, innovation, ethical considerations | Diverse perspectives, multidisciplinary insights | Enhanced AI literacy, awareness | Use of ChatGPT, ethical AI practices | ChatGPT |
| 10 | (Walter, 2024) | Case studies and narrative literature review, Swiss University | Enhanced critical thinking, AI literacy | Increased access, diverse needs | Improved comprehension, communication skills | AI tools, interactive methods | ChatGPT |
| 11 | (Hu et al., 2022) | Survey, 272 students | Improved engagement, motivation | Better understanding of western culture | Enhanced listening, speaking skills | Use of films, interactive methods | Not mentioned |
| 12 | (Idham et al., 2024) | Survey, in-depth interviews, 16 English lecturers | Enhanced teaching, digital literacy | Personalized learning, tailored content | Improved grammar, plagiarism detection | AI tools, continuous learning | Not mentioned |
| 13 | (Peres, 2024) | Exploratory study, content analysis, no sample size | Improved understanding, coherent text generation | Wide access, simple interface | Enhanced health literacy | Use of AI, structured questions | ChatGPT |
| 14 | (Sallam, 2023) | Systematic review, 60 records | Improved scientific writing, personalized learning | Enhanced health literacy, personalized medicine | Improved critical thinking, problem-based learning | Use of ChatGPT, ethical AI practices | Not relevant |
| 15 | (X. Zhang et al., 2023) | Multi-disciplinary, University students | Improved engagement, motivation | Better understanding of cultural contexts | Enhanced listening, speaking skills | AI tools, interactive methods | Not mentioned |
| 16 | (Bender, 2024) | Discussion article in English education | Enhanced AI awareness, digital literacy | Equitable access, diverse applications | Improved reading, writing skills | Use of AI tools, ethical practices | Gen-AI and ChatGPT |

## Results and Discussion

*AI in Language Learning and Teaching*

Artificial Intelligence (AI) is being increasingly used in language learning and teaching, as shown by various studies on its application, benefits, and challenges. AI tools like machine translation and generative AI significantly enhance language learner's skills particularly in writing. Lee et al. (2024) studied Korean university students' views on AI based writing tools like Google Translate and Grammarly. They found these tools significantly enhance English learner's writing skills through accessibility and effective error-checking. However, over-reliance on these tools may impede natural learning, highlighting the need for a balanced

approach where AI supports but does not replace the learning process. Similarly, Woo et al., (2023) highlighted that natural language generation (NLG) tools can help EFL students generate ideas for creative writing. However, their findings suggest that while these tools can inspire creativity, students may resist machine-generated ideas. This indicates that NLG tools need to be carefully implemented to effectively complement human creativity.

Further exploring AI's role in language learning, Wang & Dong (2023) developed a neural machine translation method that greatly improves the accuracy of English vocabulary translation. This model enhances domain sensitivity by extracting contextual features, addressing the common issue of low domain accuracy in current translation models. This advancement shows AI's potential in enhancing specific language skills, making it a valuable tool in language education. Meanwhile, Al-khresheh (2024) studied teachers' perspectives on using ChatGPT in English language teaching (ELT). The findings highlighted both positive and negative impacts as AI's potential for personalized learning and concerns about maintaining language accuracy and stifling creativity. Alzubi, (2024), examined the use of generative AI tools in EFL writing and found that students had a medium level of literacy with these tools. This indicates potential but highlights the need for better training and increased awareness. Escalante et al., (2023) compared AI-generated feedback to human feedback in writing and found both to be equally effective in improving learning outcomes. This suggests that AI tools can be used in teaching without harming educational quality, advocating for a blended approach that combines the strengths of both AI and human feedback.

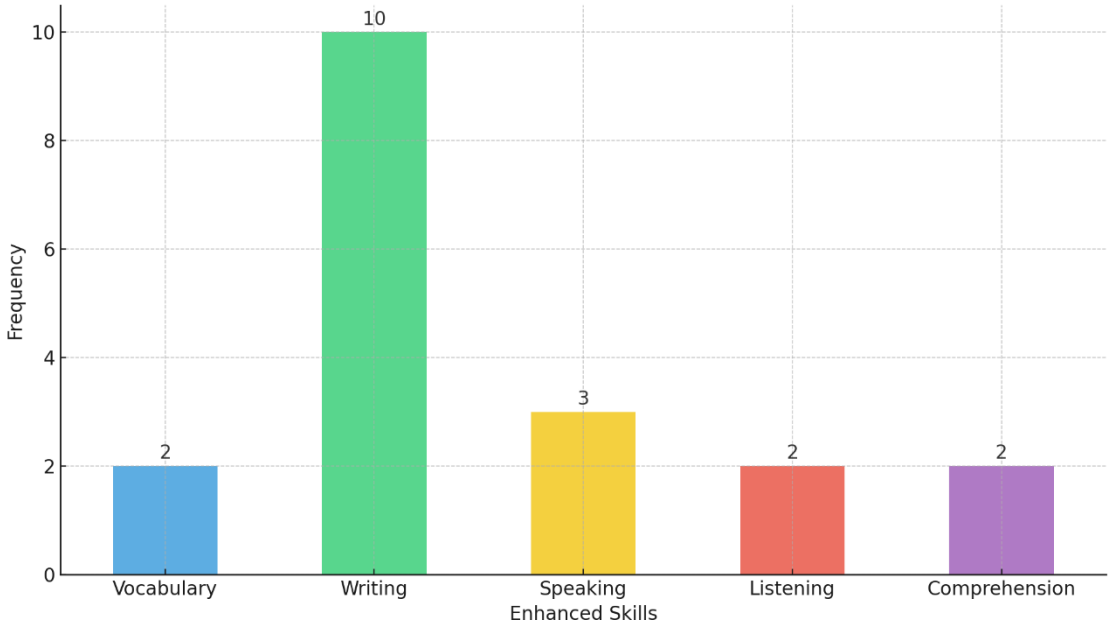


Figure 2. Frequency of Enhanced Skills in Language Acquisition studies

The bar chart in Figure 2 illustrates the frequency of various enhanced skills reported in language acquisition studies (Table 3). The skills examined include vocabulary, writing, speaking, listening, and comprehension. The data indicates that writing skills are the most frequently enhanced skill, being mentioned in 10 studies. This is followed by speaking, vocabulary, listening, and comprehension, each reported in 3, 2, 2, and 2 studies, respectively. This suggests a strong emphasis on improving writing abilities within language acquisition research, potentially reflecting the importance of writing as a fundamental component of

language proficiency. The relatively lower frequency of listening and comprehension enhancements might indicate areas for future research focus to provide a more balanced approach to language skill development.

Kostikova et al., (2024) demonstrated the use of ChatGPT to develop a professional English course, showing AI's practical benefits in curriculum design and implementation. Their study highlighted AI's ability to create diverse educational content and offer extensive instructional support. This supports Alam et al., (2023) findings that Grammarly effectively improves ESL learners' writing accuracy by reducing grammatical errors. Together, these studies highlight AI's transformative potential in enhancing language learning. Chu & Szlagor, (2023) introduced a cloud-based multi-intelligence English teaching model that combines AI with traditional methods to encourage collaborative and independent learning. Results found that blended approach significantly motivates students and improves learning outcomes. Alshumaimeri & Alshememry (2024) reviewed AI applications in EFL learning, highlighting both the benefits and challenges of using AI in education.

Finally, Krange et al., (2023) explored AI-based automated essay assessment tools for eighth-grade students and found they are beneficial when combined with teacher guidance and peer support. This analysis shows that AI can significantly impact language learning and teaching, highlighting its potential to transform education while emphasizing the importance of careful implementation.

*AI for Accessibility and Specialized Learning*

Integrating artificial intelligence (AI) tools in education particularly for accessibility and specialized learning offered transformative benefits. AI platforms like ChatGPT, Imagine Art and others provide real time feedback and personalized learning experiences that addressing the diverse needs of learners. Study demonstrated that AI can significantly improve language acquisition and comprehension by offering tailored support and engaging learning strategies. For instance, Mudrik & Charles (2023) highlighted how the multi-lingual DALL-E Storytime framework enhances comprehension through visual storytelling that making complex texts accessible to non-English speakers. Additionally, AI tools have shown promise in overcoming geographical barriers and providing equitable access which crucial for inclusive education.

Furthermore, AI technologies have been instrumental in supporting learners with specialized needs. AI translation tools that been discussed by Kustini et al. (2020), facilitate better comprehension and participation from non-native English speakers, thereby promoting inclusivity. AI tools also enhance the learning experience by providing adaptive learning environments that cater to individual learning styles and progress levels. Demonstrated by Woerner et al. (2024) found that AI improves student engagement and understanding in higher education. Overall, the strategic implementation of AI in education can revolutionize learning outcomes making education more accessible and effective for all students.

*AI Integration in Educational Platforms and Tools*

The integration of AI in educational platforms has significantly improved learning, enhancing language acquisition, comprehension, and overall satisfaction. Dengel et al., (2023) found ChatGPT and BARD provide diverse, context-dependent responses, better for

exploratory than formal research. Similarly, Malakul & Park (2023), discovered that AI-generated auto-subtitles in educational videos improve comprehension, reduce cognitive load, and increase student satisfaction, highlighting AI's benefits for online learning. White et al., (2023) demonstrated the practical use of AI with the WHO's EARS platform, which analyzes social media posts about COVID-19 to aid public health responses.

Advanced AI applications in educational now include interactive learning and language teaching. Yufang, (2024) introduced an AI web platform enhancing English skills with speech recognition, personalized feedback, and real-time interactions. Similarly, Cheng et al., (2024) developed a neural network-based online teaching system that enhances speech recognition for English instruction, significantly improving students' pronunciation and learning outcomes. Moorhouse, (2024) found that beginning and first-year language teachers are generally well-prepared to integrate generative AI tools like ChatGPT and recognize their potential to support language education

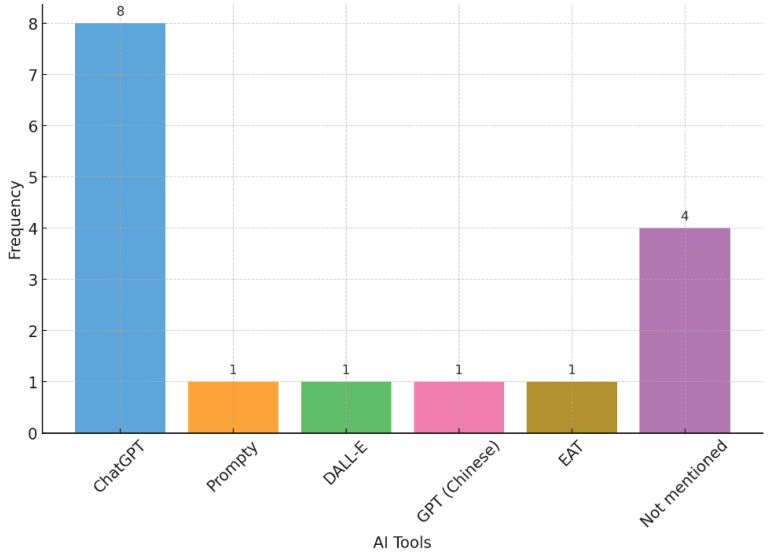


Figure 3. Frequency Of AI Tools Used In Studies

The bar chart in Figure 3 illustrates the analysis of AI tools used in various studies, revealing a strong preference for ChatGPT, which is utilized in 8 out of the 16 studies. Other AI tools, such as Prompty, DALL-E, and the Chinese version of GPT, are used less frequently, appearing in only one study each. Additionally, there are four studies where the specific AI tools are not mentioned. This trend indicates that ChatGPT is the most popular AI tool for enhancing language acquisition, critical thinking, and writing skills in educational settings. The widespread use of ChatGPT suggests its effectiveness and versatility in academic applications, making it a valuable tool for researchers and educators aiming to improve learning outcomes.

AI is used in educational mobile apps to improve vocabulary learning. Nasir et al., (2023) developed an AI-based app using deep learning for interactive English and Arabic vocabulary learning. This app employs convolutional neural networks for image recognition, enabling children to enhance their vocabulary through fun activities. Additionally, Zhang et al., (2024) studied the SmallTalk AI tool, finding that Industry 4.0 technologies positively impact language learning, suggesting that adaptable, self-supported learning systems can significantly improve student outcomes.

AI enhances digital social understanding in education. Lee et al., (2023) introduced a Metaverse platform where students and smart machines interact and learn together, boosting motivation and performance through advanced natural language processing and data analysis. Finally, Corizzo & Leal-Arenas, (2023) addressed academic integrity by using one-class learning models and linguistic features to detect AI-generated essays, tackling the increasing use of AI in education.

In summary, integrating AI in education has shown significant benefits in various learning and teaching aspects. AI enhances language acquisition, learning comprehension, supports public health initiatives, and ensures academic integrity. These technologies are revolutionizing education, providing innovative solutions and new opportunities for educators and students.

*Co-occurrence Analysis of AI-related Research Themes in English Literacy Education*

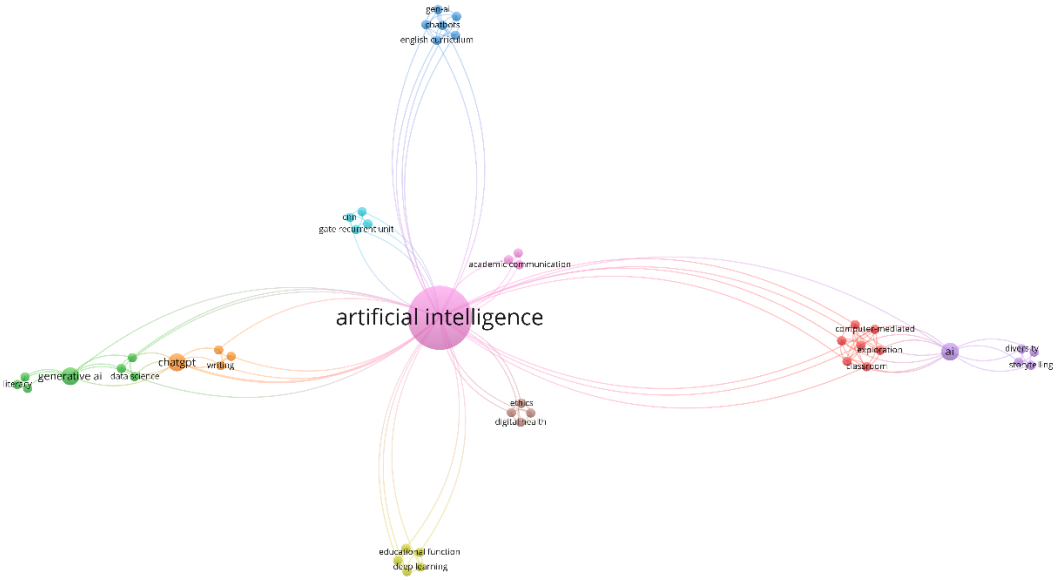


Figure 4**.** Keyword Co-occurrence Network of AI in English Literacy Education

The final research question, “What pivotal research themes underpin the development and growth of artificial intelligence in English literacy education?”, is addressed through a keyword co-occurrence analysis derived from author-supplied terms. Figure 4 visualises the network of frequently co-occurring keywords (minimum of four occurrences), constructed using VOSviewer. This visualisation offers insight into the conceptual structure and thematic landscape of current AI research within the field of English literacy.

At the centre of the network lies the term “artificial intelligence”, represented by the largest and most prominent node. Its centrality highlights the overarching influence of AI across a broad spectrum of related educational topics, with multiple clusters extending from it, each representing a distinctive sub-theme within the field.

The green cluster, anchored by “generative AI”, includes terms such as literacy, data science, and ChatGPT, suggesting an emerging concentration on AI-powered writing tools and data-informed personalised learning. This cluster reflects research interest in how generative

models contribute to literacy improvement, especially in producing tailored content and feedback mechanisms.

The orange cluster, closely linked to the green, focuses on “ChatGPT” and “writing”, indicating significant attention toward language models that support student composition skills. This sub-theme illustrates how AI facilitates writing development through grammar correction, vocabulary enhancement, and structure refinement, particularly within EFL and ESL contexts.

In the red cluster, keywords such as computer-mediated, exploration, and classroom indicate a pedagogical orientation. This cluster encompasses discussions on integrating AI into classroom instruction and how computer-mediated tools foster active exploration and engagement among learners.

On the right-hand side, the purple cluster includes abstract and interdisciplinary terms such as storytelling, diversity, and simply AI, revealing broader narratives surrounding inclusive education, cultural representation, and creativity supported by artificial intelligence. It reflects a shift from purely technical applications to more humanistic dimensions of AI in education.

The blue cluster, with terms such as GPT, chatbots, and English curriculum, signals interest in curriculum alignment and the deployment of conversational agents to enhance educational delivery. This cluster suggests the use of AI for responsive dialogue systems, aiding students' comprehension and communication skills within structured curricular frameworks.

The yellow cluster centres on deep learning and educational function, signifying foundational technologies that power AI applications in education. It represents methodological studies and systems-level discussions concerning the role of deep learning models in teaching and learning effectiveness.

Smaller but important nodes such as ethics, digital health, and academic communication (light pink and brown clusters) highlight growing concerns over ethical AI usage, privacy, and the integration of AI in scholarly discourse.

In conclusion, this co-occurrence network reveals a multidimensional landscape in which AI intersects with literacy education through practical tools (e.g., ChatGPT), conceptual frameworks (e.g., deep learning and ethics), and pedagogical strategies (e.g., classroom integration and storytelling). It reflects a vibrant and evolving field where technological innovation is increasingly aligned with inclusive, ethical, and student-centred educational practices.

**Conclusions**

The body of research on AI-based tools for English language learning reveals both opportunities and challenges. AI tools can enhance writing skills and provide immediate feedback, impacting learning outcomes positively. However, overreliance on these tools may undermine students' critical thinking abilities. Additionally, while tools like ChatGPT offer

personalized learning experiences, they raise concerns about linguistic accuracy and overdependence, potentially affecting students' creative expression and language skills. Comparing AI-generated feedback with human feedback shows no significant difference in learning outcomes, suggesting that AI can effectively complement human instruction. However, a blended approach combining AI and human feedback is most beneficial, ensuring comprehensive guidance for students. The integration of AI technologies also demonstrates significant advancements in educational accessibility. AI-based systems, such as those translating Sign Language (SL) to English and vice versa, provide substantial support for individuals with hearing impairments. Furthermore, IoT-based AI-powered systems for braille learning, which translate braille into audio, assist visually impaired individuals and their families. These innovations highlight the potential of AI to enhance specialized learning and educational accessibility for students with diverse needs. This study contributes to the social science field by synthesizing current findings on AI-driven English language learning and identifying the pedagogical balance required between automation and human instruction. The novelty of this research lies in its integrative perspective that connects cognitive, linguistic, and accessibility dimensions of AI in education, extending the discourse beyond performance metrics to include ethical and creative implications. In conclusion, while AI-based tools have the potential to significantly improve English language learning by offering instant feedback and aiding in idea generation, maintaining a balanced approach is crucial. Educators should thoughtfully integrate these tools to ensure they enhance rather than hinder students' learning experiences, creativity, and critical thinking skills. This balanced integration can optimize learning outcomes, engagement, and overall satisfaction among students and teachers in various educational contexts.

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