AI as an Impediment to Linguistic Creativity in English Language Learners: A Comprehensive Review of a Literature

Aisha Bhatti[1]

[1] Department of English, College of Science and Humanities, Prince Sattam Bin Abdulaziz University, Al-Kharj, Saudi Arabia

Correspondence: Aisha Bhatti, Department of English, College of Science and Humanities, Prince Sattam Bin Abdulaziz University, Al-Kharj, 16278, Saudi Arabia. E-mail: a.bhatti@psau.edu.sa

Received: February 23, 2024 Accepted: April 24, 2025 Online Published: June 6, 2025

doi:10.5430/wjel.v15n6p289 URL: https://doi.org/10.5430/wjel.v15n6p289

Abstract

Artificial Intelligence (AI) in English language learning has sparked worries about how technology can affect English as a second language (ESL) learners' creativity and deep learning processes. With the advancement of AI tools in the learning sector, ESL learners may learn the English language in entirely new ways. These AI tools make grammar correction, content creation, and writing support incredibly simple. The main issue is that these technologies may restrict learners' creativity, ability to think critically, and ability to explore new ideas by automating language functions. Since AI tools offer standardized, formulaic recommendations, ESL learners could be dissuaded from experimenting with language or creating distinctive voices. This paper critically examines the growing concern that AI's propensity for standardized writing may hinder ESL learners' capacity for critical thought, original concept development, and in-depth introspection. Although AI is adept at managing writing's technical parts, it lacks the contextual, cultural, and emotional intelligence that encourages creative expression. This review explores how AI affects creativity, highlighting its pros and cons. Besides, it advocates a comprehensive approach that uses AI to enhance human-led instruction rather than to replace it. To ensure that AI technology enhances rather than detracts from English language learners' creative growth, this issue must be addressed.

Keywords: writing assistance, AI tools, English language, creative expression

1. Introduction

The capacity of computer systems to simulate cognitive processes like learning and problem-solving is known as artificial intelligence AI (Gavrilova, 2020). The emergence of new AI tools for generative, creative work and their recent mainstream popularization offer revolutionary new opportunities for upending conventional ideas about creativity, authorship, and the creative process. These systems use advanced machine learning techniques, such as deep learning and reinforcement learning, to find patterns and structures in massive, unstructured, publicly available datasets. This allows them to perform a variety of tasks and provide distinct, coherent outputs. Chat GPT (Generative Pre-trained Transformer), the next wave of artificial intelligence, is ushering in a new historical period for the imaginative progress of intelligent technology. This technology is not only substantially affecting and changing the production, life, and communication patterns of the whole civilization, but also fundamentally transforming society and humanity (Hill-Yardin et al., 2023).

The strategic significance of AI in education is increasingly emphasized (Seldon & Abidoye, 2018). According to Loeckx (2016), artificial intelligence (AI) has the potential to be a useful teaching tool that relieves teachers of some of their workload while providing learners with engaging learning opportunities. There are many chances for the development of AI applications in education, especially when combined with contemporary educational reforms like gamification, digitization of instructional materials, and tailored learning experiences (Loeckx, 2016).

Artificial intelligence (AI) is changing every aspect of life, and the educational system is no exception. Many nations, including Singapore, Malaysia, and South Korea, have been forced by technology to adopt technology consumption in the educational sector (Ahmad & Ghapar, 2019; Hua*, 2012; Sánchez et al., 2011). For ease of consideration, the effects of AI on education may be broadly divided into three categories: "guidance," "teacher," and "student." By classifying earlier AI methods in education, new methods can be developed with a more precise focus. With AI developing and becoming more widespread, it is helpful to have an organizational structure to decide on its execution with knowledge and ramifications for education's future (Nguyen, 2023).

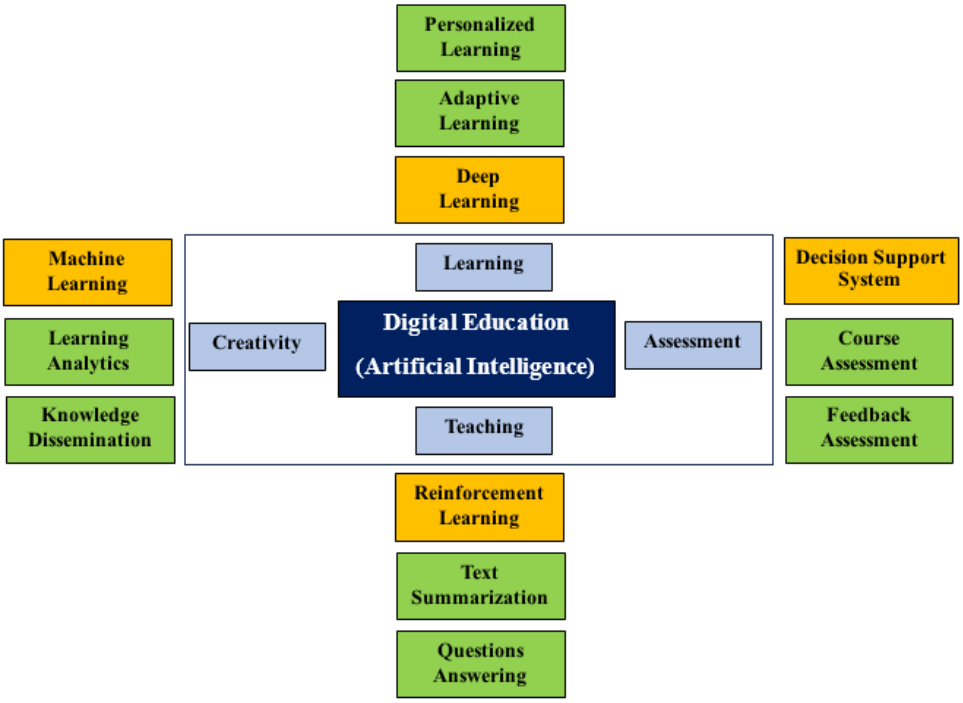

Figure 1. Integration of Artificial Intelligence in Digital Education

This diagram illustrates the multifaceted role of AI technologies such as machine learning (ML), deep learning (DL), reinforcement learning (RL), and decision support systems (DSS) in enhancing digital education. Core educational components including, learning, teaching, creativity, and assessment, are supported by AI-driven applications like adaptive learning, learning analytics, and feedback systems, thereby enabling personalized and efficient educational experiences. It is evident that alternative modes of AI are used in the educational system. Artificial intelligence (AI) facilitates digital learning which in turn becomes beneficial for learners and educators. AI is made up of several algorithms as decision support systems, machine learning, deep learning and reinforcement learning. In terms of learning analytics and knowledge distribution, adaptive learning and personalized learning, Text summarization and question answering, feedback analysis and course evaluation, these algorithms are supporting the teaching, learning, and assessment process for both educators and learners (Dube et al., 2023).

Around the world, learning English is an essential task. Individuals frequently invest time, money, and resources into acquiring various applications in order to be able to converse, locate employment prospects, travel the world, and learn about other cultures by seeing English-language television shows, films, and music. In addition, many scholarships need a high degree of proficiency in the language of England (Abdalkader, 2022). A number of factors may contribute to these challenges, such as the use of antiquated instructional techniques that do not satisfy contemporary expectations or motivate students to learn; they frequently focus solely on syntax and vocabulary without any authentic, natural context (Williams & Vaughn, 2020).

In this context, we examine how artificial intelligence (AI), albeit a potent learning tool, may potentially limit English language learners' inventiveness. This review article highlights the concerns regarding AI tools' effects on learners' creativity, especially generating novel ideas and expressions, which are raised by the growing integration of these technologies into language acquisition. Learners' capacity to think critically and come up with original replies may decline as they grow more dependent on information produced by AI.

1.1 Rationale of Current Review

The rapid adoption of AI tools in education has transformed the landscape of language learning, offering new opportunities and challenges. While AI technologies provide substantial support in grammar correction, vocabulary expansion, and writing assistance, their impact on learners' creativity remains a subject of debate. Researchers and educators' express concerns that reliance on AI-driven suggestions may suppress learners' ability to think critically and develop unique writing styles. The automation of linguistic processes also brings up moral concerns about cognitive growth, academic honesty, and originality. This review aims to systematically assess existing research on AI's influence on creativity in English language learning, identifying gaps in knowledge and proposing balanced strategies for integrating AI into language education without compromising creative growth. This study was conducted using three broad research questions as a guide.

1. How does AI influence creativity in English language learners?
2. What are the potential benefits of AI-powered tools in fostering creativity and learning efficiency?
3. In what ways does AI hinder deep cognitive engagement and original thought in language learners?

2. Methodology for Literature Review

2.1 Samples

The sample for this review consisted of 136 peer-reviewed articles that addressed the intersection of artificial intelligence (AI) and English language learning, with focusing on creativity. The selected literature included original research articles and review papers published in reputable journals indexed in databases such as Scopus, Web of Science, and Google Scholar. The final pool was refined to include 79 high-quality articles, primarily indexed in Citation Index databases, for in-depth qualitative analysis.

2.2 Instruments

The primary instruments used in this review were academic databases (Google Scholar, Scopus, and Web of Science) and a keyword-based search strategy. Keywords and Boolean operators (e.g., 'AI in English language learning', 'AI and creativity', 'AI as a creativity killer') were systematically applied. Additionally, a PRISMA checklist guided the inclusion and exclusion process to ensure methodological rigor. A data extraction form was employed to record publication details, methodologies, key findings, and relevance to the review objectives.

2.3 Selection procedure

The article selection process was structured into four stages:

1. **Identification:** A total of 289 articles were initially retrieved from the selected databases using the specified keyword searches.
2. **Screening:** After removing 74 duplicate records, 215 unique articles remained for screening.
3. **Eligibility:** The abstracts and full texts of selected articles were assessed for relevance to the research topic. At this stage, 79 articles were excluded due to a lack of focus on AI in language learning or creativity.
4. **Inclusion:** A final total of 136 articles met the inclusion criteria. Of these, 79 recent and high-quality articles indexed in Citation Index databases were further selected for in-depth analysis due to their relevance to artificial intelligence applications in English language learning and educational research.

The article selection procedure is visually represented in the PRISMA flow diagram Figure 1, which outlines the systematic process of article identification, screening, eligibility assessment, and final inclusion.

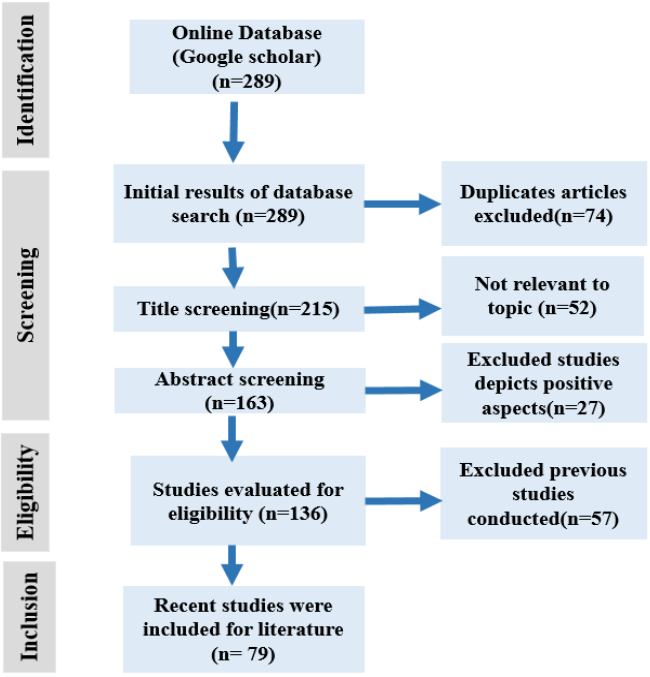

Figure 2. PRISMA flow diagram

In the screening process, duplicates and unrelated articles were excluded based on titles and abstracts. In the eligibility process. Articles were further filtered by relevance and novelty, excluding those focusing solely on positive aspects or outdated studies. In the inclusion process, a final set of recent, relevant, and high-quality articles (n=79) were included for in-depth analysis.

2.4 Data Collection

Data collection involved extracting key information from the selected articles, including study design, sample population, statistical tools used, and conclusions relevant to English language education. This information was tabulated to identify common methodological trends, and gaps in the existing literature. Both qualitative insights and quantitative metrics (where available) were recorded to support qualitative and thematic synthesis.

2.5 Data Analysis

In accordance with PRISMA guidelines, data were extracted from the final set of 79 studies using a structured extraction form. Extracted data included authorship, year of publication, study design, target population, AI tool used, impact on creativity or critical thinking, and overall findings. A thematic synthesis was carried out, organizing the studies into major themes such as 'AI and vocabulary acquisition,' 'AI and creativity in writing,' and 'teacher perspectives on AI.' Meta-analysis was not possible because of the variation in research design and assessed results. Instead, a narrative synthesis was conducted to highlight consistent trends, conflicting evidence, and gaps in the existing literature. Studies were also assessed for methodological quality and relevance.

3. Findings

3.1 Creativity in English Language Acquisition

The Latin word "Creare" meaning to make and the Greek word "Krelnein" meaning to complete are the sources of the term "creativity" (Siddiqi, 2022). Thus, we might define creativity as the ability to 'make up' something novel and worthwhile (Gold, 2021). The capacity to come up with anything original, be it a solution or a new technique, is creativity. Two fundamental ideas in creativity are uniqueness and appropriateness (King et al., 1996). 'Literary language' and creativity are related to learning the English language. Innovative learning system raises motivation levels and equips learners with the necessary abilities. Without fostering creativity, the instruction would resemble something robotic or manufactured. Learners'abilities to think creatively are enhanced through creative education (Jones & Richards, 2015).

Educators have also looked at methods, approaches, or curricula that encourage learners' creativity. Many circumstances that foster creativity and language acquisition are motivation and cognitive engagement. Encouraging feedback to develop ideas in a learner-centered learning environment and boosting learners' confidence enables them to promote their productive ideas and foster critical thinking (Jacobs & Renandya, 2019; Lee & Hannafin, 2016). Cognitive resources are necessary for language processing, hence more cognitive resources required, the lower the degree of language proficiency. Consequently, there may not be enough resources left over to engage in critical thinking if inadequate language proficiency consumes an excessive amount of them (Manalo & Sheppard, 2016).

A small number of studies have shown a positive relationship between creativity and the use of literature as a language resource, literacy attainment and motivation. As for creativity, this has made it relevant to examine it as part of a general focus on traits and how these affect learners' and teachers' abilities, beliefs, and behavior concerning language learning (Calafato & Gudim, 2022; Katalkina et al., 2022). Lin, Prestona, Kharrufa, and Kong (2016) investigated the use of Computer Supported Collaborative Learning Environments (CSCLE) as multimodal spaces for fostering critical thinking in an English as a second language (ESL) context. This study shows that the use of a multitouch tabletop and an accompanying application (Lin et al., 2016).

AI technologies are being incorporated into English language learning and teaching more and more to enhance accessibility, efficiency, and motivation in the classroom. The development and implementation of more complex language learning software, which can communicate with language learners in a manner that closely resembles human speech, has also been made possible by advancements in artificial intelligence.

The area of Natural Language Processing (NLP) integrates linguistics and computer science to allow computers to comprehend and produce spoken and written human language (Kumar Attar & Komal, 2022).

Although language models and AI writing aids have advanced significantly, most academics believe it is doubtful that these tools will soon totally replace traditional academic writing courses. This was confirmed by earlier studies that AI can replace academic writing in the near future (Chocarro et al., 2023; N. Zhai & Ma, 2022). AI has replaced the creative mindset of English language learners.

3.2 AI Tools and Their Influence on English Language Learners

Artificial intelligence (AI) applications provide tailored feedback, prompt responses, and detailed engagement for English language learners. This might spark a revolution in English language instruction that would benefit from a wider range of instructional approaches. Since, AI has become more integrated into learning platforms, questions are raised about how it can impact traditional teaching methods, learner autonomy, and the reliability of language acquisition. Conducting research on artificial intelligence (AI) in English language learning is crucial to comprehending its possible advantages and advancing efficient teaching methods (Wei, 2023). Different AI tools were used by English language students as discussed below:

3.2.1 ChatGPT

OpenAI created the ChatGPT (Chat Generative Pre-Trained Transformer) artificial intelligence language model, which is based on GPT-3 (Firat, 2023). The objective of ChatGPT's creation in 2021 was to create text that reads and sounds like real human speech. One of the biggest language models available is GPT-3. Its capacity to translate, summarize, respond to queries, and create content with little to no

task-specific training highlights its adaptability in language processing. GPT-3 has been utilized in a wide range of industries since it was originally made accessible, including linguistic modeling, content production, and language translation (Chen et al., 2023). ChatGPT is one of the many AI's that have gained notoriety and sparked academic discussion among experts in several fields. ChatGPT, powered by OpenAI, was created to replicate human-like academic writing in a thorough and cogent manner (Shahriar & Hayawi, 2023).

Numerous studies have looked at the application and effects of ChatGPT in various language-learning settings. Because ChatGPT can help learners to learn and provide individualized experiences, its launch has generated much interest in the field of language instruction (Kasneci et al., 2023; MacNeil et al., 2024). Some studies have looked into the experiences and perceptions of learners. However, the majority of the early studies using ChatGPT in language instruction concentrated on the viewpoints of teachers.

At a Chinese international English-medium university, Xiao and Zhi looked into the pedagogical potential of ChatGPT for raising English language learners' proficiency. To evaluate the opinions and experiences of the learners utilizing ChatGPT, brief qualitative research was carried out. The critical evaluation of learners' concepts and language learning outcomes showed improvements. Participants praised ChatGPT for being an interactive personal teacher and learning aid that offered rational feedback and guidance whenever needed for writing instruction related to the International English Language Testing System (IELTS). Three of the five learners in this qualitative study characterized ChatGPT as a peer tutor, offering assistance that they thought was easier to get than their lecturers (Xiao & Zhi, 2023).

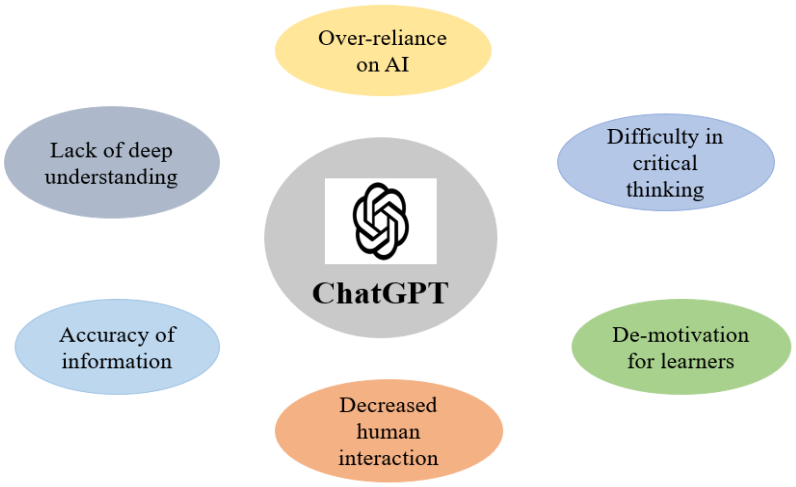

Figure 3. Negative impacts of ChatGPT

From the above Figure 3, The Potential negative impacts of ChatGPT on language learners, includes overreliance on AI, decreased human interaction, demotivation, reduced critical thinking, lack of deep understanding, and concerns regarding the accuracy of information. This shows that ChatGPT affects language learners and educators. Learners rely on ChatGPT, and it affects their critical thinking, motivation, and communication skills. Educators use AI tools like ChatGPT to prepare lectures, but lack accuracy and understanding. ChatGPT can affect the critical thinking power, deep understanding, and creativity of students and learners (Bai et al., 2023).

According to the research studies, English for Academic Purposes (EAP) is a type of language instruction designed to help people learning English as a second language acquire the language skills necessary for academic activities. In the last few years, the emphasis on learners within the EAP setting has grown (Bruce, 2021; Hyland & Jiang, 2021; Tavakoli & Tavakol, 2018). ChatGPT has been included in EAP courses to understand languages by providing English learners interactive exercises that improve their vocabulary, grammar, and sentence construction (Danilina & Le Pichon, 2024). ChatGPT may be used by English language learners to gain assistance with writing projects, including brainstorming, improving sentence structure, and checking for grammatical errors (Javaid et al., 2023). In a research study, Lingard emphasized that ChatGPT can help EAP learners with their academic writing by acting as a writing tool or a brainstorming tool. It can affect English learners' creativity and skills (Lingard, 2023).

Tseng and Lin (2024) during the institution's 'English Composition III' course, recruited fifteen non-majors in English from a private university in Taiwan for qualitative research. The findings show that ChatGPT considerably boosts English writing productivity by offering immediate feedback and coming up with original content ideas, which expedites the writing process. Additionally, the study demonstrates how ChatGPT helps learners write more coherently and organize their ideas more clearly. It emphasizes how learners form a dynamic partnership with ChatGPT when they engage with it (Tseng & Lin, 2024).

ChatGPT has both positive and negative effects on language learning. Increasing learner autonomy, individualized instruction, and lessening the workload of educators showed a positive impact. On the other hand, ChatGPT's negative aspect is illustrated by the threats it poses to academic integrity and originality, support for cheating, the spread of misleading information, and the encouragement of plagiarism (Derakhshan & Ghiasvand, 2024). There are issues with ChatGPT's accuracy and dependability while using it in the classroom. ChatGPT may be biased or include errors because it was trained on a vast corpus of data (Sallam, 2023).

Alm and Watanabe (2023) investigated the effects of ChatGPT's on language education through the prism of Paul Freire's critical pedagogy. They acknowledged the potential of promoting cultural biases and encouraging passive learning, but they also emphasized ChatGPT's capacity to offer personalized, interactive, and situational learning possibilities. However, they additionally stated that ChatGPT may be guided by particular inquiries to encourage discussion and real-world language acquisition. Despite the initial mixed reviews from academics, it is evident that ChatGPT has the potential to alter teaching and learning methods as studies on technology in language education continue. This can affect the critical thinking and creative ideas of educators and learners (Alm & Watanabe, 2023).

Moreover, the integration of ChatGPT in language learning can cause significant ethical concerns like data privacy, intellectual property rights, and academic integrity. While it comes to data privacy, educators and organizations need to create clear policies and procedures and make sure that learners understand their rights and duties while utilizing ChatGPT and other AI applications (Du & Alm, 2024).

3.2.2. Grammarly

Grammarly is a digital writing helper that provides English language authors with automated proofreading help and constructive criticism. It is one of the most well-liked ones (Fernando & Suryaman, 2022; Ummah & Bisriyah, 2022). In higher education, Grammarly is now getting a lot of attention for academic writing (Miranty & Widiati, 2021). Since this program is simple to install and operate, it was deemed viable (Armanda et al., 2022; Wardatin et al., 2022).

The effects of automated writing evaluation (AWE) on second language (L2) learners are well documented in the literature. However, most of these studies focus on the impact of automated feedback on writing performance, meaning that little is known about how it impacts sentimental aspects. The use of automated writing evaluation (AWE) by educators and learners as an additional kind of feedback to assist with writing in a second language (L2) has increased significantly (Koltovskaia, 2023). Researchers have undertaken a number of studies on Grammarly, with varying degrees of success. In contrast, research indicates that Grammarly supports learners in enhancing ESL learners' writing proficiency, lexical richness, and grammatical correctness among university learners (Dizon & Gayed, 2021; Dodigovic & Tovmasyan, 2021; Ghufron & Rosyida, 2018).

When it comes to grammar, punctuation, and style fixes, English language learners sometimes rely too much on Grammarly. Learning a language requires trial and error, but this excessive reliance might make it more difficult. Although Grammarly has some advantages but it can also reduce learners' motivation to rectify their mistakes independently (O' Neill & Russell, 2019). Automated suggestions offered in Grammarly may prevent learners from engaging deeply with the text and learning to identify and correct their errors. Grammarly can inhibit deeper learning especially in language learners (Gautam & Jerripothula, 2020).

Grammarly can have negative impacts on student's critical thinking skills even though it is good for enhancing grammar and writing mechanics. Grammarly lessens the requirement that learners work closely with their writing by automatically recommending fixes. Learners' capacity to autonomously solve problems and think critically about their writing decisions may be limited if they rely too much on technology, which might also keep them from seeing and comprehending their errors.This may lead to a superficial learning process, where students concentrate on quickly correcting errors rather than cultivating the critical thinking and creative revision skills essential for true language mastery (Setyani et al., 2023).

3.2.3 Quillbot

Quillbot is an internet program that uses cutting-edge artificial intelligence to paraphrase any text. With Quillbot's paraphrasing capability, authors may effortlessly rewrite and rearrange the content from the source by altering the original sentences. Several scholars have expressed interest in using Quillbot for research and academic writing. The impact of using Quillbot in academic writing indicates that learners may gain much from this online resource, including summarizing intricate phrases, avoiding plagiarism, and refining language to sound more polished and understandable (Fitria, 2021b; Kurniati & Fithriani, 2022).

Although AI tools like Quillbot, ChatGPT, Grammarly, and others can automate certain operations, they are unlikely to completely replace researchers. However, the skill set required may vary. In addition to their traditional research skills, researchers and language learners need to adapt their methodologies and become more proficient with AI technology (Brynjolfsson & Mcafee, 2017). QuillBots' paraphrasing feature may cause learners to become overly reliant, hindering their ability to independently absorb and rewrite knowledge.Negative impact of Quillbot's as reported that learners rely on it overly and undervalue their writing and critical thinking skills (Jaladara et al., 2023).

Although it performs better than other software choices, the Quillbot grammar checker has flaws that require manual error checks. Instructor comments should be included in the tool so that teachers may concentrate on content and organization and have more time to address grammatical problem (Ho, 2022).

3.2.4 Google Translate

Although there has been much discussion over the role of translation in language learning and teaching, it is impossible to deny that translation is a helpful method included in language classroom activities (Dagilienė, 2012). Sarigül (2016) revealed that language learners can benefit from dictionaries, and those who are able to use them well can continue their studies outside of the classroom. Previously, it is stated

> "Dictionary training should be an integral part of any syllabus" (p.157)

Google Translate (GT) is a free language translation tool that–Google offers to internet users to translate from source languages to

destination languages. Compared to a standard dictionary, Google Translator has become a more useful tool. Thanks to its speed and accuracy with contemporary terms and collocations, it is especially helpful for online study. An increase in the number of language learners who utilize this translation tool and are aware of it for their learning process (Josefsson, 2011).

GT is used by English majors and learners from other degrees to enhance their English language proficiency. For instance, engineering students utilize GT to improve their English language abilities and look up technical jargon (Zulkifli et al., 2019). Complex AI models like GT can be difficult to interpret, particularly those that rely on deep learning. Scholars may find it difficult to comprehend how the model comes to its findings. Because it sometimes hides errors that lead to confusion in the information obtained.

The attempts are vital to create AI models that are easier to understand for use in research (Lipton et al., 2018). According to Yanti & Meka (2019), the first drawback was that learners became too indolent to open dictionaries. GT or online translation dictionaries have taken the role of manual dictionaries. The second drawback was that GT sometimes did not work properly and give inaccurate results with grammatical error. Learners can't identify the mistakes properly due to lack of thinking capability.

3.3 AI in the English Classroom: A Boon or Bane for Creativity?

The use of AI in English classes has spurred a contentious discussion over whether or not AI encourages or stifles student creativity. On the one hand, AI tools such as writing aids, grammar checks, and tailored learning platforms have completely transformed English language learners' approaches to language acquisition. However, some contend that these technologies might stifle creative thinking, weaken problem-solving abilities, and lead to an excessive dependence on technology (Anis & Khalid, 2024).

3.3.1 AI as a Boon for Creativity

1. Improved Learning and Experimentation: Students are encouraged to experiment with a variety of writing styles and strategies by the use of AI-powered tools such as natural language generators. AI platforms can encourage students to try new things with their writing by offering ideas and stylistic variants, which may help them expand their creative boundaries (Ou et al., 2024).
2. Personalized Learning: AI provides customized feedback according to each learner's unique learning style. This customization inspires original solutions to writing problems and encourages students of all skill levels (Fitria, 2021a; Seo et al., 2021).
3. Breaking down Barriers through Language: AI-driven language models have made it possible for non-native English speakers to communicate more freely.These tools provide students with greater confidence to explore creative ideas by simplifying the technical parts of writing (Raheem et al., 2023).
4. Instant Feedback: Students may immediately see the effects of changes they make to their work with the help of instant grammar and style advice. Because real-time feedback enables more rapid iteration and improvement, it can foster innovation (Gupta, 2022).

3.3.2 AI as a Bane for Creativity

1. Over-Reliance on AI technologies: One of the main concerns is that learners could become overly reliant on AI technologies, which could impede their capacity to think critically and solve problems. If students rely too much on AI-generated ideas, they may lose the opportunity to fully engage in the writing process (C. Zhai et al., 2024).
2. Standardization of Language: The development of a distinctive voice or style may be stifled by this uniformity, which would restrict the artistic creativity of learners (Acar et al., 2019)
3. Decrease in Deep Thinking: The rapidity at which AI can solve language issues might discourage students from thinking more thoroughly or attempting more challenging writing assignments. For some students, immediate solutions are more important than completing challenging writing assignments creativity (Alharbi, 2023).
4. Academic Integrity and Ethics Concerns: The development of AI systems capable of producing creative works or whole essays poses ethical and integrity concerns. Students may put less effort into the creative process as a result of this simple access to content creation (Baek & Wilson, 2024).

The extent to which AI influences creativity will depend on how it is used in English classrooms. When used carefully, artificial intelligence (AI) may be a valuable tool that helps students reach their full creative potential by putting less emphasis on technological limitations and more on ideas. Unchecked dependence on these instruments, however, runs the danger of stifling original ideas and leading to more formulaic, less imaginative work. Instructors and students need to come up with a well-rounded strategy that takes use of AI's advantages while encouraging autonomous innovation and critical thinking.

3.4 Comparing AI-Assisted vs. Human-Led English Learning

3.4.1 Personalization and Flexibility

Table 1. Comparison of personalization and flexibility among AI-assisted and Human led English learning

AI-Assisted English Learning	Human-Led English Learning
• AI-driven tools in language learning use algorithms to assess student progress, pinpoint weaknesses, and deliver personalized instruction. • It offers real-time feedback and modifies difficulty levels based on the learner's speed. • Hyper-personalization makes AI tools perfect for self-paced learning, letting learners go at their own pace (De la Vall & Araya, 2023).	• Human instructors can personalize lessons but due to limited time phrase they may not provide immediate feedback. • They offer deeper comprehension by considering non-verbal signs and emotional states, which AI might overlook. • This leads to more sympathetic and customized assistance.

3.4.2 Depth of Knowledge and Creativity

Table 2. Comparison of depth of knowledge and creativity among AI-assisted and Human led English learning

AI-Assisted English Learning	Human-Led English Learning
• AI does a great job in teaching fundamental abilities for English learners like grammar, vocabulary, and pronunciation. But it has trouble in teaching complex ideas like creative writing or literary interpretation. • It often lacks the originality and depth found in human interaction.	• Teachers are excellent at imparting sophisticated language skills, such as critical thinking, creative writing, and tone interpretation, while also supplying the cultural background necessary for language acquisition. • Human interaction fosters candid conversations that advance creativity and comprehension (Afzal et al., 2023).

3.4.3 Flexibility and Accessibility

Table 3. Comparison of flexibility and accessibility among-assisted and human led English learning

AI-Assisted English Learning	Human-Led English Learning
• AI offers learners' unmatched flexibility by enabling access to take English language classes anytime, anywhere. • Regional boundaries are eliminated by its on-demand availability, enabling a worldwide audience to practice with a variety of accents and dialects (Anis & Khalid, 2024).	• AI is available around-the-clock, while human-led learning is restricted to set times and places. • However, by encouraging responsibility, structured in-person instruction may be advantageous for English learners (Anis & Khalid, 2024).

3.5 Potential Risks of Overreliance on AI in Learning English Language

This study explores the effects of AI-assisted tools on university ESL learners' individualized learning and academic English reading abilities in the classroom with regard to how AI tools support learners' assessments. The emphasis was on issues like the overuse of AI and its ethical ramifications. It offers priceless insights into the possible advantages and difficulties of developing AI tools to improve leaners' reading comprehension of English in higher education settings (Chea & Xiao, 2024).

Abd-Alrazaq et al., (2023) issued a warning against the tendency of generative AI tools to create incorrect information and invent claims that are not true. Users may become overly dependent on these technologies as a result, increasing the danger of dependence. This over-reliance may prevent medical and other students from developing critical thinking, problem-solving, and effective communication skills. The ease with which AI tools may respond to queries could discourage students from conducting in-depth studies and developing their own opinions, making it difficult to integrate these tools in a way that strengthens rather than weakens critical thinking and problem-solving skills. The above discussion is well illustrated by the figure below Figure 4.

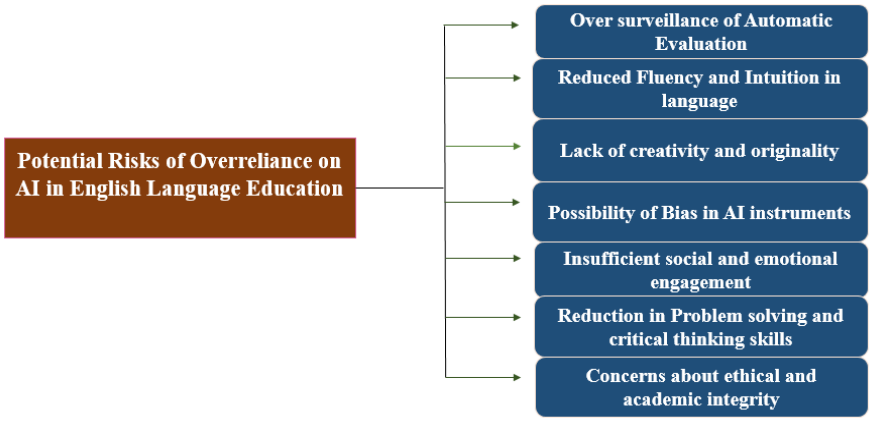

Figure 4. Potential risks by Using AI in Language Learning.

The Figure 4 illustrates the different risks of overreliance on AI in learning. For instance, a lack of creativity, a reduction in problem-solving, ethical issues, and others, were presented.

According to Santiago Jr et al.,(2023), professors and users have differing opinions about the application of AI techniques. Although some people find these tools useful in improving their writing abilities, there is a general worry that an excessive reliance on them might result in less work being put into creating well-structured sentences and using correct syntax and spelling. The faculty is concerned that this dependency would jeopardize students' ability to acquire critical writing and research abilities. The discipline of critically assessing information sources, cross-referencing data, and developing a thorough comprehension of study issues may all be weakened by the overuse of AI technologies, which would ultimately impair one's capacity for independent analysis and interpretation.

The negative consequences of relying too much on the AI conversation system are pointed out, as it might jeopardize students' ability to exercise critical thinking and solve problems. They contend that students run the danger of failing to acquire the critical thinking skills, logical argument construction, and knowledge integration from a variety of sources necessary for success in both their academic and professional endeavors if they rely too much on AI to generate material (Koos & Wachsmann, 2023).

5. Conclusion

In conclusion, artificial intelligence (AI) has clear advantages in simplifying language learning through real-time feedback, personalized instruction and improving accessibility. However, excessive usage of AI can seriously harm English language learners' creative thinking and learning process. To avoid these pitfalls, teachers can carefully use AI for repetitive activities (like grammar drills) and save creative writing and literary analysis for conversations led by humans that encourage creativity. Learners should critically engage with AI outputs to preserve their unique voices and complement automated tools with peer collaboration for emotional and contextual depth. Policymakers, in turn, must establish ethical guidelines such as bias audits and transparency standards and invest in teacher training programs to ensure AI supplements, rather than supplants, human instruction. A key limitation of this review is the absence of empirical studies that critically examine the long-term impact of AI tools on the creative development of English language learners. Research demonstrates that although AI is good at organized tasks but struggles to develop rhetorical or cultural awareness, hybrid models (flipped classrooms) succeed in combining efficiency and in-depth learning. Ultimately, AI's role should be to amplify, not automate, the human-centered pedagogies that nurture the creativity and adaptability essential for language mastery.

Acknowledgment

The author extends her appreciation to Prince Sattam bin Abdulaziz University for funding this research work through the project number (PSAU/2025/R/1446).

Authors' contributions

NA

Funding

The author extends her appreciation to Prince Sattam bin Abdulaziz University for funding this research work through the project number (PSAU/2025/R/1446).

Competing interests

The author declares that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Sciedu Press.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

References

Abd-Alrazaq, A., AlSaad, R., Alhuwail, D., Ahmed, A., Healy, P. M., Latifi, S., … Sheikh, J. (2023). Large language models in medical education: opportunities, challenges, and future directions. *JMIR Medical Education*, *9*(1), e48291. https://doi.org/10.2196/48291

Abdalkader, S. M. A. (2022). Using Artificial Intelligence to improve Writing Fluency for The Preparatory Stage Students in Distinguished Governmental Language Schools. *Egyptian Journal of Educational Sciences*, *2*(2), 39-70. https://doi.org/10.21608/ejes.2022.270694

Acar, O. A., Tarakci, M., & Van Knippenberg, D. (2019). Creativity and innovation under constraints: A cross-disciplinary integrative review. *Journal of Management*, *45*(1), 96-121. https://doi.org/10.1177/0149206318805832

Ahmad, M. F., & Ghapar, W. R. G. W. A. (2019). The era of artificial intelligence in Malaysian higher education: Impact and challenges in tangible mixed-reality learning system toward self exploration education (SEE). *Procedia Computer Science*, *163*, 2-10. https://doi.org/10.1016/j.procs.2019.12.079

Alharbi, W. (2023). AI in the foreign language classroom: A pedagogical overview of automated writing assistance tools. *Education Research International*, *2023*(1), 4253331. https://doi.org/10.1155/2023/4253331

Alm, A., & Watanabe, Y. (2023). Integrating ChatGPT in Language Education: A Freirean Perspective. *Iranian Journal of Language Teaching Research*, *11*(3 (Special Issue)), 19-30.

Anis, N., & Khalid, B. (2024). *Teachers' and Students' Perception about the Effects of Using ChatGPT, Grammarly, and Quillbot on Students' Writing Skills*. university center of abdalhafid boussouf-MILA.

Armanda, M. L., Nugraheni, A. F., Wulansari, A., & Imron, A. (2022). " Grammarly" as English Writing Assistant from EFL Students' Perspective. *English Education: Journal of English Teaching and Research*, *7*(2), 128-137. https://doi.org/10.29407/jetar.v7i2.17988

Baek, E. O., & Wilson, R. V. (2024). An Inquiry Into the Use of Generative AI and Its Implications in Education: Boon or Bane. *International Journal of Adult Education and Technology (IJAET)*, *15*(1), 1-14. https://doi.org/10.4018/IJAET.349233

Bai, L., Liu, X., & Su, J. (2023). *ChatGPT: The cognitive effects on learning and memory. Brain-X*, *1*(3), e30. https://doi.org/10.1002/brx2.30

Bruce, I. (2021). Towards an EAP without borders: Developing knowledge, practitioners, and communities. *International Journal of English for Academic Purposes: Research and Practice*, *2021*(Spring), 23-36. https://doi.org/10.3828/ijeap.2021.3

Brynjolfsson, E., & Mcafee, A. (2017). Artificial intelligence, for real. *Harvard Business Review*, *1*, 1-31.

Calafato, R., & Gudim, F. (2022). Comics as a multimodal resource and students' willingness to communicate in Russian. *Journal of Graphic Novels and Comics*, *13*(2), 270-286. https://doi.org/10.1080/21504857.2021.1951788

Chea, P., & Xiao, Y. (2024). Artificial Intelligence in Higher Education: The Power and Damage of AI-assisted Tools on Academic English Reading Skills. *Journal of General Education and Humanities*, *3*(3), 287-306. https://doi.org/10.58421/gehu.v3i3.242

Chen, S., Zhang, K., Li, X., Ye, H., Lin, K. J., & Law, R. (2023). ChatGPT: Cross-cultural tourism research imperative. *Journal of Economics and Management*, *45*(1), 137-146. https://doi.org/10.22367/jem.2023.45.07

Chocarro, R., Cortiñas, M., & Marcos-Matás, G. (2023). Teachers' attitudes towards chatbots in education: a technology acceptance model

approach considering the effect of social language, bot proactiveness, and users' characteristics. *Educational Studies*, *49*(2), 295-313. https://doi.org/10.1080/03055698.2020.1850426

Dagilienė, I. (2012). Translation as a learning method in English language teaching. *Studies about Languages*, *21*, 124-129. https://doi.org/10.5755/j01.sal.0.21.1469

Danilina, E., & Le Pichon, E. (2024). Embracing Advances in AI-Based Language Tools in EAP Programs: Towards a Plurilingual Shift. In *Reconceptualizing Language Norms in Multilingual Contexts* (pp. 88–107). IGI Global. https://doi.org/10.4018/978-1-6684-8761-7.ch005

De la Vall, R. R. F., & Araya, F. G. (2023). Exploring the benefits and challenges of AI-language learning tools. *International Journal of Social Sciences and Humanities Invention*, *10*(01), 7569-7576. https://doi.org/10.18535/ijsshi/v10i01.02

Derakhshan, A., & Ghiasvand, F. (2024). Is ChatGPT an evil or an angel for second language education and research? A phenomenographic study of research-active EFL teachers' perceptions. *International Journal of Applied Linguistics*. https://doi.org/10.1111/ijal.12561

Dizon, G., & Gayed, J. M. (2021). Examining the impact of Grammarly on the quality of mobile l2 writing. *Jalt Call Journal*, *17*(2), 74-92. https://doi.org/10.29140/jaltcall.v17n2.336

Dodigovic, M., & Tovmasyan, A. (2021). Automated writing evaluation: The accuracy of Grammarly's feedback on form. *International Journal of TESOL Studies*, *3*(2), 71-87. https://doi.org/10.46451/ijts.2021.06.06

Du, J., & Alm, A. (2024). The impact of ChatGPT on English for academic purposes (EAP) students' language learning experience: A self-determination theory perspective. *Education Sciences*, *14*(7), 726. https://doi.org/10.3390/educsci14070726

Dube, M., Masengu, R., Sibanda, S., & Mandongwe, L. (2023). Assessment: higher education institutions' innovative online assessment methods beyond the era of the COVID-19 pandemic. In *Digital teaching, learning and assessment* (pp. 121-146). Elsevier. https://doi.org/10.1016/B978-0-323-95500-3.00010-9

Fernando, E. K., & Suryaman, M. (2022). Appropriating Grammar as a Tool in Writing Activities: Student's Perception. *Journal of English Language and Education*, *7*(2), 1-8. https://doi.org/10.31004/jele.v7i2.232

Firat, M. (2023). What ChatGPT means for universities: Perceptions of scholars and students. *Journal of Applied Learning and Teaching*, *6*(1), 57-63. https://doi.org/10.37074/jalt.2023.6.1.22

Fitria, T. N. (2021a). Artificial intelligence (AI) in education: Using AI tools for teaching and learning process. *Prosiding Seminar Nasional & Call for Paper STIE AAS*, *4*(1), 134-147.

Fitria, T. N. (2021b). Grammarly as AI-powered English writing assistant: Students' alternative for writing English. *Metathesis: Journal of English Language, Literature, and Teaching*, *5*(1), 65-78. https://doi.org/10.31002/metathesis.v5i1.3519

Gautam, A., & Jerripothula, K. R. (2020). Sgg: Spinbot, grammarly and glove based fake news detection. *2020 IEEE Sixth International Conference on Multimedia Big Data (BigMM)*, 174-182. https://doi.org/10.1109/BigMM50055.2020.00033

Gavrilova, Y. (2020). Artificial Intelligence vs. *Machine Learning vs. Deep Learning: Essentials*.

Ghufron, M. A., & Rosyida, F. (2018). The role of Grammarly in assessing English as a Foreign Language (EFL) writing. *Lingua Cultura*, *12*(4), 395-403. https://doi.org/10.21512/lc.v12i4.4582

Gold, R. (2021). *The plenitude: Creativity, innovation, and making stuff*. MIT press.

Gupta, S. K. (2022). Artificial Intelligence is Curse or Boon. *Galaxy International Interdisciplinary Research Journal*, *10*(2), 155-160.

Hill-Yardin, E. L., Hutchinson, M. R., Laycock, R., & Spencer, S. J. (2023). A Chat (GPT) about the future of scientific publishing. *Brain, Behavior, and Immunity*, *110*, 152-154.

Ho, C. C. (2022). The QuillBot grammar checker: friend or foe of ESL student writers?/Ho Chui Chui. *Journal of Creative Practices in Language Learning and Teaching (CPLT)*, *10*(1), 10-31.

Hua*, M. T. A. (2012). Promises and threats: iN2015 Masterplan to pervasive computing in Singapore. *Science, Technology and Society*, *17*(1), 37-56. https://doi.org/10.1177/097172181101700103

Hyland, K., & Jiang, F. K. (2021). A bibliometric study of EAP research: Who is doing what, where and when? *Journal of English for Academic Purposes*, *49*, 100929. https://doi.org/10.1016/j.jeap.2020.100929

Jacobs, G. M., & Renandya, W. A. (2019). *Student centered cooperative learning: Linking concepts in education to promote student learning*. Springer. https://doi.org/10.1007/978-981-13-7213-1

Jaladara, A. R., Jafar, M. B., & Salija, K. (2023). Quillbot web-application: Utilizing online technology on academic writing at an Indonesian Islamic higher education. *Celebes Journal of Language Studies*, 275-284. https://doi.org/10.51629/cjls.v3i2.152

Javaid, M., Haleem, A., Singh, R. P., Khan, S., & Khan, I. H. (2023). Unlocking the opportunities through ChatGPT Tool towards ameliorating the education system. *BenchCouncil Transactions on Benchmarks, Standards and Evaluations*, *3*(2), 100115. https://doi.org/10.1016/j.tbench.2023.100115

Jones, R. H., & Richards, J. C. (2015). *Creativity in language teaching: Perspectives from research and practice*. Routledge. https://doi.org/10.4324/9781315730936

Josefsson, E. (2011). *Contemporary approaches to translation in the classroom: A study of students' attitudes and strategies*.

Kasneci, E., Seßler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., … Hüllermeier, E. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences, 103*, 102274. https://doi.org/10.1016/j.lindif.2023.102274

Katalkina, N. A., Bogdanova, N. V, & Pankrateva, G. I. (2022). The use of literary works for stimulating students' creativity. *Technology, Innovation and Creativity in Digital Society: XXI Professional Culture of the Specialist of the Future*, 937-947. https://doi.org/10.1007/978-3-030-89708-6_75

King, L. A., Walker, L. M., & Broyles, S. J. (1996). Creativity and the five-factor model. *Journal of Research in Personality, 30*(2), 189-203. https://doi.org/10.1006/jrpe.1996.0013

Koltovskaia, S. (2023). Postsecondary L2 writing teachers' use and perceptions of Grammarly as a complement to their feedback. *ReCALL, 35*(3), 290-304. https://doi.org/10.1017/S0958344022000179

Koos, S., & Wachsmann, S. (2023). Navigating the Impact of ChatGPT/GPT4 on Legal Academic Examinations: Challenges, Opportunities and Recommendations. *Media Iuris, 6*(2). https://doi.org/10.20473/mi.v6i2.45270

Kumar Attar, R., & Komal. (2022). The emergence of Natural Language Processing (NLP) techniques in healthcare AI. In *Artificial intelligence for innovative healthcare informatics* (pp. 285-307). Springer. https://doi.org/10.1007/978-3-030-96569-3_14

Kurniati, E. Y., & Fithriani, R. (2022). Post-graduate students' perceptions of Quillbot utilization in English academic writing class. *Journal of English Language Teaching and Linguistics, 7*(3), 437-451. https://doi.org/10.21462/jeltl.v7i3.852

Lee, E., & Hannafin, M. J. (2016). A design framework for enhancing engagement in student-centered learning: Own it, learn it, and share it. *Educational Technology Research and Development, 64*, 707-734. https://doi.org/10.1007/s11423-015-9422-5

Lin, M., Preston, A., Kharrufa, A., & Kong, Z. (2016). Making L2 learners' reasoning skills visible: The potential of computer supported collaborative learning environments. *Thinking Skills and Creativity, 22*, 303-322. https://doi.org/10.1016/j.tsc.2016.06.004

Lingard, L. (2023). Writing with ChatGPT: An illustration of its capacity, limitations & implications for academic writers. *Perspectives on Medical Education, 12*(1), 261. https://doi.org/10.5334/pme.1072

Lipton, Z., Wang, Y.-X., & Smola, A. (2018). Detecting and correcting for label shift with black box predictors. *International Conference on Machine Learning*, 3122-3130.

Loeckx, J. (2016). Blurring boundaries in education: Context and impact of MOOCs. *International Review of Research in Open and Distributed Learning, 17*(3), 92-121. https://doi.org/10.19173/irrodl.v17i3.2395

MacNeil, A. J., Dagra, A., & Lucke-Wold, B. (2024). Commentary: Usefulness and Accuracy of Artificial Intelligence Chatbot Responses to Patient Questions for Neurosurgical Procedures. *Neurosurgery, 95*(1), e10-e11. https://doi.org/10.1227/neu.0000000000002879

Manalo, E., & Sheppard, C. (2016). How might language affect critical thinking performance? *Thinking Skills and Creativity, 21*, 41-49. https://doi.org/10.1016/j.tsc.2016.05.005

Miranty, D., & Widiati, U. (2021). An automated writing evaluation (AWE) in higher education. *Pegem Journal of Education and Instruction, 11*(4), 126-137. https://doi.org/10.47750/pegegog.11.04.12

Nguyen, N. D. (2023). Exploring the role of AI in education. *London Journal of Social Sciences, 6*, 84-95.

O'Neill, R., & Russell, A. M. T. (2019). Grammarly: Help or hindrance? Academic learning advisors' perceptions of an online grammar checker. *Journal of Academic Language and Learning, 13*(1), A88-A107.

Ou, A. W., Stöhr, C., & Malmström, H. (2024). Academic communication with AI-powered language tools in higher education: From a post-humanist perspective. *System, 121*, 103225. https://doi.org/10.1016/j.system.2024.103225

Raheem, B. R., Anjum, F., & Ghafar, Z. N. (2023). Exploring the profound impact of artificial intelligence applications (Quillbot, Grammarly and ChatGPT) on English academic writing: A Systematic Review. *International Journal of Integrative Research (IJIR), 1*(10), 599-622.

Sallam, M. (2023). The utility of ChatGPT as an example of large language models in healthcare education, research and practice: Systematic review on the future perspectives and potential limitations. *MedRxiv*, 2002-2023. https://doi.org/10.1101/2023.02.19.23286155

Sánchez, J., Salinas, A., & Harris, J. (2011). Education with Ict in South Korea and chile. *International Journal of Educational Development, 31*(2), 126-148. https://doi.org/10.1016/j.ijedudev.2010.03.003

Santiago Jr, C. S., Embang, S. I., Conlu, M. T. N., Acanto, R. B., Lausa, S. M., Ambojia, K. W. P., … Balilo Jr, B. B. (2023). Utilization of writing assistance tools in research in selected higher learning institutions in the philippines: A text mining analysis. *International*

Journal of Learning, Teaching and Educational Research, *22*(11), 259-284. https://doi.org/10.26803/ijlter.22.11.14

Seldon, A., & Abidoye, O. (2018). *The fourth education revolution*. Legend Press Ltd. DOI:10.1007/s10734-020-00506-5

Seo, K., Tang, J., Roll, I., Fels, S., & Yoon, D. (2021). The impact of artificial intelligence on learner–instructor interaction in online learning. *International Journal of Educational Technology in Higher Education*, *18*, 1-23. https://doi.org/10.1186/s41239-021-00292-9

Setyani, E. D., Bunau, E., & Rezeki, Y. S. (2023). The influence of Grammarly towards Indonesian EFL students' first-degree thesis writing confidence. *Elsya: Journal of English Language Studies*, *5*(1), 54-67. https://doi.org/10.31849/elsya.v5i1.6773

Shahriar, S., & Hayawi, K. (2023). Let's have a chat! A Conversation with ChatGPT: Technology, Applications, and Limitations. *ArXiv Preprint ArXiv:2302.13817*.

Siddiqi, M. (2022). Creativity in Language Teaching. *Pakistan Journal of Applied Social Sciences*, *13*(2), 1-16. https://doi.org/10.46568/pjass.v13i2.600

Tavakoli, M., & Tavakol, M. (2018). Problematizing EAP education in Iran: A critical ethnographic study of educational, political, and sociocultural roots. *Journal of English for Academic Purposes*, *31*, 28-43. https://doi.org/10.1016/j.jeap.2017.12.007

Tseng, Y. C., & Lin, Y. H. (2024). Enhancing English as a Foreign Language (EFL) Learners' Writing with ChatGPT: A University-Level Course Design. *Electronic Journal of E-Learning*, *22*(2), 78-97. https://doi.org/10.34190/ejel.21.5.3329

Ummah, L. K., & Bisriyah, M. (2022). EFL students' perception on Grammarly premium's feedback and dealing with inaccuracies. *JEES (Journal of English Educators Society)*, *7*(2), 163-172. https://doi.org/10.21070/jees.v7i2.1687

Wardatin, F. N., Setiawan, S., Mustofa, A., & Nugroho, H. A. (2022). Integrating self-directed learning in facilitating writers engagement through Grammarly: Exploring the perceptions of premium users. *EnJourMe (English Journal of Merdeka): Culture, Language, and Teaching of English*, *7*(1), 32-46. https://doi.org/10.26905/enjourme.v7i1.6849

Wei, L. (2023). Artificial intelligence in language instruction: impact on English learning achievement, L2 motivation, and self-regulated learning. *Frontiers in Psychology*, *14*, 1261955. https://doi.org/10.3389/fpsyg.2023.1261955

Williams, K. J., & Vaughn, S. (2020). Effects of an intensive reading intervention for ninth-grade English learners with learning disabilities. *Learning Disability Quarterly*, *43*(3), 154-166. https://doi.org/10.1177/0731948719851745

Xiao, Y., & Zhi, Y. (2023). An exploratory study of EFL learners' use of ChatGPT for language learning tasks: Experience and perceptions. *Languages*, *8*(3), 212. https://doi.org/10.3390/languages8030212

Zhai, C., Wibowo, S., & Li, L. D. (2024). The effects of over-reliance on AI dialogue systems on students' cognitive abilities: a systematic review. *Smart Learning Environments*, *11*(1), 28. https://doi.org/10.1186/s40561-024-00316-7

Zhai, N., & Ma, X. (2022). Automated writing evaluation (AWE) feedback: A systematic investigation of college students' acceptance. *Computer Assisted Language Learning*, *35*(9), 2817-2842. https://doi.org/10.1080/09588221.2021.1897019

Zulkifli, F., Mohamed, Z., & Azmee, N. A. (2019). Systematic research on predictive models on students' academic performance in higher education. *International Journal of Recent Technology and Engineering*, *8*(2), 357-363. https://doi.org/10.35940/ijrte.B1061.0782S319