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Impact of AI Exposure on the Development of English Language Skills: A Single-Participant Case Study-Based Investigation

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Abstract

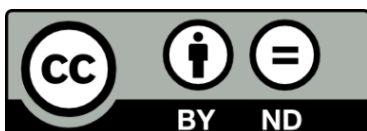
Developing English language skills in ESL learners is a long-experienced challenge for teachers and the learners. In this scenario, consistent interaction with artificial intelligence (AI) tools capable of orchestrating authentic interactions with the language is found to be useful in facilitating learners to acquire and master of English language skills. Such tools have the potential to create opportunities for learners to achieve personalised and interactive learning experiences, enable teachers to provide individualised feedback, and open avant-garde adaptive pathways for learning. Additionally, they may promote learners' motivation, encourage their active participation, and engage them in self-directed learning procedures. Therefore, this exploratory single-participant case study aims to investigate whether exposure to AI has a positive impact on developing English language skills. The data were collected using a qualitative case study focused on an academic in a public university in Sri Lanka. The data collection methods included semi-structured interviews, document analysis, and observations. The results obtained during the action research and empirical study indicated that consistent interaction with AI tools facilitates the acquisition of English language skills and enables individuals to use them confidently in authentic situations.

Keywords: AI Exposure, Artificial intelligence, Case study, English language skills, ESL learners

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With the rapid advancement of digital technologies, Artificial Intelligence (AI), functions as a transformative tool in education, particularly in second and foreign language learning. AI refers to the simulation of human intelligence through computational systems capable of performing tasks such as reasoning, learning, problem-solving, communication, and perception (Pannu, 2015; Kasirzadeh & Gabriel, 2023). AI has evolved into a discipline concerned with the simulation of human cognitive processes such as reasoning, learning, perception, and communication. The term "artificial intelligence" was first introduced by McCarthy in 1956 (McCarthy et al., 2006). Primarily, Artificial Intelligence was developed as a branch of computer science. However, today, AI applications can be applied across diverse fields. They have successfully eliminated numerous obstacles, transforming education into a more adaptive and individualised learning environment.

The use of AI has been significantly increasing across different sectors, including language education. AI reproduces human intelligence through diverse computational processes (Zawacki-Richter et al., 2019) and produces computer programmes that filter knowledge and help individuals do their tasks independently (Rahman et al. 2025). AI enables individuals to learn like machines, and it supports solving

complicated issues in a way that resembles human thinking (Nilsson, 2009). As a multidisciplinary area of study within the broader field of computer science, AI has been used to solve cognitive and linguistic problems, which are new ways to help people learn and develop languages (Russell & Norvig, 2021).

English, one of the most studied languages in the world (Crystal, 2003), acts worldwide as a lingua franca in connecting people from diverse professional backgrounds across multiple contexts. Therefore, the acquisition of English language skills is indispensable for personal development and enhanced professional achievements. A thorough command of English ensures access to a wealth of information and resources and absorption of a wide knowledge and understanding of the world. Despite its global significance, teaching and learning English as a second language is a challenge in many non-English-speaking countries, including Sri Lanka. Learners often encounter linguistic and non-linguistic barriers such as limited exposure to authentic language use, a lack of confidence, insufficient opportunities for interaction, and inadequate learning resources. These barriers compel educators and researchers to explore methods of using artificial intelligence (AI) tools to support ESL learners.

In language education, AI technologies have increasingly been used to support teaching and learning processes



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through adaptive, interactive, and personalised learning environments. It facilitates learning and independent problem-solving (Zawacki-Richter et al., 2019; Rahman et al., 2025). Furthermore, AI-based systems assist learners in engaging with language tasks autonomously while receiving immediate support and feedback. According to Russell and Norvig (2021), AI applications are capable of addressing the cognitive and communicative challenges commonly associated with language learning.

AI is designed as a tool to allow learners to access immediate feedback and continuous opportunities for autonomous, self-directed learning. Additionally, through its use of adaptive algorithms and personalised learning paths, AI provides learners with the opportunity to autonomously assess their language skills, determine areas of need, and learn repetitively based on their own specific needs and preferences (Zawacki-Richter et al., 2019; Russell & Norvig, 2021). Additionally, the rapid response time of AI promotes the development of learner autonomy, self-efficacy, and confidence by enabling learners to monitor their progress and take responsibility for their language development (Rahman et al., 2025). Moreover, AI-enabled learning environments provide learners with equitable access to valuable language learning resources by granting access to these resources anytime, anywhere (Holmes et al., 2019). Furthermore, AI

tools also support learners' acquisition of numerous language competencies (e.g., vocabulary building, grammatical precision, sentence structure, punctuation, spelling, pronunciation and the contextual use of language) (Shadiev & Liu, 2023). Therefore, AI-assisted learning environments may improve language proficiency and promote independent learner behaviours, ultimately facilitating successful communication in academic, professional, and social settings using English as a second language.

Constant interaction with AI tools may support individuals in acquiring the English language and enhancing their language skills. As a result, learning English as a foreign or a second language has become easier. These tools may provide individuals with opportunities to practice the target language in interactive artificial contexts. Interactive learning fosters engagement, motivation, and the practical application of language skills. Interactive learning encourages learners' spontaneous use of language, builds confidence, and increases better retention of language skills (Song et al., 2026). Additionally, interactive language learning may expose learners to diverse perspectives, enriching their language comprehension and expression abilities. AI tools provide individualised language experiences and demonstrate how language functions in authentic situations. Interactive learning enables learners to use language in meaningful contexts



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and bridges the gap between theoretical knowledge and practical use (Duranti & Goodwin, 1992). By engaging students more actively, efficiently, and effectively, these tools enhance their target learning experience. They are also adaptable and flexible which allows individualised instruction that accounts for each learner's unique needs and learning styles.

In terms of sociocultural theory, interaction is vital for students' language development; thus, the key method through which students create knowledge and gain communicative skills is engaging with language through meaningful interactions in a variety of situations (Vygotsky, 1978). Similarly, Stephen Krashen's Input Hypothesis (1982) argues that language acquisition occurs when learners are exposed to meaningful and comprehensible input slightly beyond their current level of competence. AI-enabled learning environments can support these processes by enabling continuous interaction, contextually relevant communication, and tailored assistance as students are able to interact over time with AI-based resources. With ongoing interaction with AI tools, learners may be able to monitor their development, identify areas to target for improvement, and engage in focused practice that can improve the self-regulation skills of learners and foster learner autonomy (Luckin et al., 2016; Escalante et al., 2023). Additionally, AI-assisted

environments can assist students in developing structural and functional features of language through the provision of context-sensitive feedback regarding language use and communicative effectiveness. The interactions provided through this support can help develop greater competency in language, improved fluency, and higher confidence in using English in academic, professional, and day-to-day settings. In light of this context, the current research studies whether ongoing interaction with AI-based resources can assist English language learners in developing their English language skills and increasing their use of English in authentic settings.

Although the use of AI-assisted language learning continues to expand and provide significant improvements to learners' grammar, spelling, vocabulary and speaking skills, both the implementation of such programmes and their impact on education are of concern. Researchers have expressed concerns regarding how the overuse of AI tools' overuse leads to less authentic human interactions, limited development of critical thinking, unequal access to technology, varying levels of digital literacy, AI tool inaccuracy, and issues surrounding academic integrity within educational settings (Biber et al., 2021; Perkins, 2023; Cotton et al., 2024). As such, there is an argument for the use of AI as a supplementary educational tool rather than a substitute for

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traditional language instruction and human interaction. Additionally, existing studies primarily evaluate either the use of select AI tools or short-term classroom applications, and very little research has explored how extended access to an AI-supported environment affects a learner's language development processes in authentic academic and professional contexts. Additionally, limited research has examined the lived experience of learners as they integrate AI into their daily communication and how continued engagement with AI may influence their language development, learner autonomy, confidence, and professional communication. In response, the current exploratory case study examines extended engagement with AI tools as a contributing factor in language acquisition and related learner behaviours in a real-world setting.

LITERATURE REVIEW

As a global lingua franca, English plays a central role in international communication. English is used in many different ways around the world as a second or foreign language in global communication, tourism, education, business and the digital world (Lan et al., 2020). The ability to communicate effectively in English requires students to develop proficiency in all four major components of the language: listening, speaking, reading and writing. The development of these four skills as a coherent system is required for

successful communication and academic success. (Grabe & Stoller, 2002). However, enhancing these skills is challenging for the teachers and learners, particularly for adult learners, as a result of linguistic barriers and non-linguistic barriers (Kormos, 2023). Linguistic barriers commonly include limited vocabulary, poor grammatical competence, the inability to pronounce English correctly, and complexities in spelling and constructing sentences appropriately in English. Non-linguistic barriers include anxiety, fear of failure, low self-esteem, a lack of motivation, and cultural differences that can hinder language acquisition. All these barriers may prevent learners from feeling confident enough to participate actively in language-learning activities, resulting in fewer opportunities for practicing their language skills and, consequently, taking longer to develop their language ability overall.

These challenges can be overcome through exposure to AI (Baranwal, 2022; Kannan & Munday, 2018). AI technology is defined as computer systems that are able to simulate some of the capabilities of human intelligence (Russell, 2021); therefore, AI technologies have been shown to support language practice, comprehension, and retention through the use of interactive and adaptive learning environments (Chen et al., 2020). Research indicates that ongoing and regular interaction with AI-based language learning platforms can



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support language learning for meaningful experiences through continual exposure to input of language, and through opportunities for practicing independently (Kohnke et al., 2023). Furthermore, AI-enhanced learning environments are likely to result in a higher level of student participation in language acquisition activities by providing students with unique and diverse experiences that meet their learning needs. Research suggests that regular exposure to AI technologies may improve language learning in the areas of grammatical accuracy, vocabulary usage, fluency, coherence, and confidence in using the language, indicating a need to continue investigating the potential educational benefits of AI in L2 learning environments (Kasneci et al., 2023; Kohnke et al., 2023; Holmes et al., 2019).

Technology has long played a significant role in language education by facilitating learning, motivating learners, and introducing innovative instructional approaches (Larsen-Freeman & Anderson, 2011; Ahmadi, 2018; Gilakjani, 2017). Artificial intelligence-assisted education has emerged as a powerful tool for promoting student engagement and facilitating self-directed learning (Shadiev & Liu, 2023). Despite Shadiev & Liu (2023) asserting that artificial intelligence is more likely to facilitate improvements in second language speaking than traditional language classroom instruction, Kohnke et al. (2023) points out that artificial

intelligence cannot replace all aspects of human interaction, including teachers' guidance and cultural immersion, within the language learning process. Therefore, a balanced integration of artificial intelligence-assisted learning with traditional teaching methodologies is critical.

Increasingly, researchers (Kasneci et al., 2023; Qi et al., 2025; Holmes et al., 2019) have investigated how different types of AI can help learners develop specific English language skills. For example, (Zawacki-Richter et al., 2019) accounted for AI aids used in particular with vocabulary, grammar, and written accuracy. They found AI tools like Grammarly, ChatGPT, and Duolingo provided students with hints on improving grammar, placing vocabulary in context, and improving their written accuracy. Chen et al. (2020) evaluated listening and speaking AI tools and found that among the tools listed, ELSA Speak and Google Assistant specifically influenced these two language skills. Chen et al. (2020) argued that engagement in AI-supported learning activities provides practice for learners' fluency and pronunciation. Researchers have also explored the role of AI in reading and comprehension development. Qi et al. (2025) suggested that AI-based learning activities led to development in reading and comprehension skills, while Kohnke et al. (2023) argued that adaptive reading systems and instant translation tools may support learners' comprehension and analytical reading



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skills. Studies suggest that AI-assisted learning environments may support gradual enhancement in grammatical accuracy, sentence complexity, vocabulary range, coherence, and confidence in communication rather than guaranteeing complete mastery of linguistic, pragmatic, or discourse competence (Qiao et al., 2025; Abano & Estremera, 2025; Wiboolyasarini & Jinowat, 2025).

Second Language Acquisition (SLA) Theory (Ellis, 2005) highlights the importance of corrective feedback in language development. Some researchers have noted that AI-based feedback can be useful in giving feedback on coherence, sentence structure, organization and writing style. The effect of personalised real-time feedback on learner engagement and motivation when learning English has been studied (Shadiev & Liu, 2023). Gamification features on AI-based learning platforms provide learners with an opportunity to engage in interactive learning that provides opportunities for repeated practice, self-directed learning, and increased interest and participation. AI tools, such as grammatical checkers, writing assistants, and conversational platforms (such as ChatGPT), give learners access to immediate corrective feedback, the opportunity for error revision, and experience practicing the use of language independently. AI-based feedback may assist learners in identifying patterns of language use and enhancing clarity and accuracy in

the way they communicate (Escalante et al., 2023).

While it is apparent that AI-supported language acquisition can benefit students, previous studies have reported numerous restrictions and concerns about the use of AI tools in education. Biber et al. (2021), Perkins, (2023) and Cotton, et al. (2024) argued that an over-indulgence of AI tools may limit a learner's level of critical interaction with the language production and editing process. It has also been suggested that by providing automated feedback, the motivation level of a learner may increase, but it will not be able to match the emotional intelligence of a human educator, or be aware of the situational context of the learner, both of which are key components in developing successful language skills (Perkins, 2023). Cotton et al. (2024) also raised concerns about the presence of inaccurate recommendations produced by the AI, the potential for bias in the AI, and the possibility for the learner to accept the erroneous feedback given to them by the AI without critical thought. These concerns highlight that rather replacing authentic human-to-human interaction, AI tools should be considered complementary resources for supporting the education of an individual and for improving their overall experience during the language acquisition period. Therefore, a balanced approach to pedagogy, where AI-supported learning and traditional methods of instruction are both



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present, may yield the highest returns based on the use of AI while mitigating its disadvantages.

Despite a considerable amount of investigation into the efficacy of AI tools in language acquisition, there has been relatively little research into the impact of sustained use of AI systems on language learners' development in both an educational and a professional setting. The first studies emerging from this suggest that providing opportunities for learners to engage regularly with platforms supported by AI may lead to improved language development and increased confidence among learners (Song et al., 2026). In addition to a shortage of qualitative studies examining learners' perceptions of their interactions with AI and how this type of exposure may inform independent language learning strategies and language use in a professional environment, many current studies rely on experimental methodological approaches, while relatively few focus on an exploratory qualitative approach examining how language is used authentically over time. The present study addresses this gap by examining observable changes in learners' language use through a comparative analysis of authentic documents produced before and after prolonged interaction with AI tools.

The study specifically considers observable developments in grammatical accuracy, sentence complexity, vocabulary range, coherence, and confidence in

professional communication. Additionally, the study acknowledges that its findings are exploratory and interpretive in nature rather than experimentally validated. Standardised language proficiency testing was not employed because the research was designed as an exploratory qualitative case study rather than a quasi-experimental investigation.

RESEARCH METHODOLOGY

This study adopted an exploratory single case study design based on interpretivist principles which emphasise the importance of how people construct meaning from their experiences in relation to their social contexts. This relies on a critique of the notion of an objective experience and, hence, claims that reality is socially constructed by people and is understood in various ways (Stake, 1995; Merriam, 1998). The study aimed to explore the complex language learning journey of an experienced academic who sought to improve his English as a second language through prolonged interaction with Artificial Intelligence (AI) tools in professional and academic contexts. This study explores how sustained interaction with AI tools influenced an adult ESL learner's English language development, particularly changes in written language, confidence, and self-directed learning practices. Using this design provided insight into the participant's lived experiences in an authentic learning environment. The

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study also served as a preliminary investigation, which may serve as a basis for further research on how AI technologies might be integrated into second language teaching and learning methodologies.

For the duration of this phase of research, the participant was observed over a period of 18 months, during which the participant had consistent interactions with various forms of AI tools used for academic, instructional, and professional communication. This lengthy period of engagement allowed for ongoing observations to be made of developmental patterns, behavioural adaptations, and changing language practices rather than through discrete observations. The primary focus of this study was to examine the participant's interaction patterns with AI technologies, the participant's motives for learning language, the development of the participant's confidence in the use of language, the participant's use of learning strategies, the challenges the participant faced, and the ways in which the participant developed his own learning processes as he engaged in an environment where he utilised AI assistance.

The participant, a Senior Lecturer in economics and computer science at a public university in Sri Lanka, has an educational background that includes a BSc (Special Degree) in mathematics and an MSc in computer applications. He has experience providing instruction in multiple areas, including mathematics for social statistics,

computer programming, and database systems. This participant's primary language is Sinhala, but over the past few years, he developed increased confidence and competency in using English, especially since he has recently adopted AI tools in academic and professional settings. This individual was purposefully selected for participation using purposive sampling due to his ongoing use of AI and his wish to improve his English proficiency, both of which align with the study's aims. Using this method aligns with qualitative case study research because it emphasises depth of understanding rather than generalisability (Patton, 2002). Although the study used one participant purposely to support its exploratory nature, this design allowed for a detailed examination of the participant's learning experiences, interactional patterns, and developmental changes over the course of the study, thus providing insights that may inform larger participant populations in future studies (Creswell & Poth, 2016; Yin, 2018).

Data collection occurred over 18 months using multiple qualitative methods, including semi-structured interviews, observations, document analysis, and reflective discussions. The data collection and analysis procedures were sampled at several points in time through each of the methods listed above. This sampling included: conducting periodic semi-structured interviews; observing



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professional interaction between the participant and others; analysing written drafts of documents; comparing written documents prepared pre-AI and post-AI; and engaging in reflective discussions with the participant about how he used AI tools.

Another significant source of data collection for this study was document analysis; the researcher examined written documents which included assignments, lecture notes, research drafts, correspondence via email from a professional context, proposals, letters and Artificial Intelligence (AI) writing prompts. In order to create a developmental time series, archival documents produced prior to having prolonged exposure to AI tools were compared with documents created after participants had interacted with AI tools for a significant amount of time. By comparing these two types of documents, the researcher was able to document changes in the basis of grammatical correctness, length of sentence, breadth of vocabulary use, clarity of meaning, and the participant's confidence when communicating professionally. To determine observable changes in the participants' written communication over time, baseline and comparative document analysis methodology was utilised. Baseline data included all documents generated prior to having regular contact with AI writing tools (e.g., emails, lecture notes, letters and academic drafts); these documents

were compared systematically with the corresponding documents generated after a lengthy period of time working under the influence of AI writing tools.

Document Analysis Matrices were utilised to categorise and monitor repeated patterns pertaining to grammatical accuracy, sentence construction, word selection, coherence, organisation and communication confidence based on previously established criteria. The analysis did not assume that the participant had achieved total acquisition of the target language; however, it provided an opportunity to establish measurable trends and patterns associated with participant success through the use of real-world communicative contexts.

The use of semi-structured interviews was an effective method of allowing the participant to reflect on his experiences, challenges, motivations, and perceptions of using AI to assist him with language learning. Using open-ended questions allowed for flexibility in his responses and encouraged a more detailed exploration of emergent theme development during the research process. Observations were conducted to examine how the participant interacted with AI tools in an authentic academic and professional setting. In 18 months, there were 24 total observations. Following each observation, field notes were written based on a structured observation guide document, yielding information regarding confidence and interaction,

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language use, communication strategies, and the use of AI. Examples included observing how the participant enhanced his engagement with AI tools while creating lecture materials, writing emails, producing drafts of research, participating in professional and academic conversations and speaking English in both formal and informal settings. Records of these observations were kept throughout the entirety of the research to keep track of how language development occurred over time and how the participant grew in confidence in using AI tools for communicating in English.

The collected data were thematically analysed for the purpose of identifying patterns regarding the participants' language acquisition and learning experiences. Systematic coding and organisation of the interview data, observational data, reflective discussions, and documentary evidence produced thematic codes by which the result section was structured to clarify and enhance the coherence of the data.

To improve the reliability and consistency of the results, triangulation was used. Evidence from interviews, observations, document analysis, and reflective conversations was compared and cross-checked for patterns that converged across several sources of evidence. The triangulation process provided verification of the reliability of the findings and reduced common limitations typically associated with a single case study research.

This research is primarily exploratory and interpretive - its findings were not derived from methods of experimental verification. The language ability of the participant was not tested using standardised evaluations because the research was a qualitative exploratory case study rather than being quasi-experimental. Consequently, the results of this research are context-related insights of observable language development due to extended use of AI tools and cannot be interpreted as definitive assessments of language acquisition.

RESULTS AND DISCUSSION

The findings from the document analysis, interview, and observations, demonstrated that exposure to AI tools had a positive impact on the participant's English language proficiency. The participant showed observable improvements in the English language as a result of using the AI tools. Furthermore, results showed the participant gained confidence, developed his writing skills, learned to communicate with academics and professionals using English, and exhibited greater autonomy in his English learning and English usage due to his experience using AI tools. Through the use of AI tools, the participant learned and improved his English language skills - primarily his writing, vocabulary, and grammar skills.

Document Analysis Evidence and



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Baseline Comparisons

A document analysis rubric was used to conduct a qualitative comparison of baseline and post-AI documents on five different dimensions (See Table 1).

Table 1. Comparative Rubric Scores

Criterion	Baseline (1-5)	Post-AI (1-5)
Grammatical Accuracy	2	4
Vocabulary Range	2	4
Sentence Complexity	2	4
Coherence and Organisation	2	4
Professional Communication Effectiveness	3	5

Note. Baseline and Post-AI scores were assigned by the researcher using an analytic writing rubric to evaluate the participant's written communication before and after AI use. Scores range from 1 (very poor) to 5 (excellent).

The results obtained from comparing rubric-based ratings (See Table 1), were able to identify significant developmental trends across all areas of examination. Although these ratings should not be interpreted as standardised scores for proficiency, they provide additional analytic transparency with which to support the findings of this study.

Representative examples of the document analysis were utilised to provide further corroboration of the findings. Baseline documents were used in comparison with the post-training documents that were created

after 18 months of regular use of AI-assisted language practice. The document analysis revealed that the participant had made measurable progress in his academic and professional writing as a result of using AI tools over a sustained period of time. Prior to his exposure to AI tools, his writing consisted of shorter sentences, numerous grammatical errors, and limited vocabulary use. In comparison, his more recent writings demonstrated increased complexity in syntax, better organisation of ideas, and more effective presentation of his academic work. Illustrative examples of observable changes to the participant's writing can be seen in the following table (See Table 2).

Table 2. Illustrative Comparison of Baseline and Post-AI Writing Samples

Language Feature	Baseline Sample	Post-AI Sample
Grammar	"I am sending this proposal for your approval and please check it."	"I am submitting this proposal for your review and would appreciate your feedback."
Vocabulary	Frequent use of common vocabulary (e.g., good, important, help)	Greater use of academic and discipline-specific vocabulary (e.g., facilitate, implementation, methodology)
Sentence Structure	Predominantly simple sentences	Increased use of complex and compound



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Coherence	Ideas presented with limited transitions	sentence structures Improved logical flow through the use of cohesive devices and transitions

Note. The examples presented are representative excerpts selected from the participant's written communication before (Baseline) and after sustained AI use (Post-AI). The excerpts illustrate qualitative changes in grammatical accuracy, vocabulary use, sentence structure, and coherence identified through the document analysis.

An evaluation of the participant's documentation found improvement in grammar, vocabulary and coherence in his written work (See Table 2). The participant demonstrated ability to write a range of sentence types from single sentences to multi clause and compound sentences. Use of AI tools at the university appeared to help clarify and enhance coherence of participants English writing. It was also determined that participant's spoken English had improved at meetings, lectures, and research presentations. Participant developed confidence attending meetings, lectures, and research presentations which is consistent with Chapelle (2001) and Kohnke et al. (2023). Where Chapelle (2001) indicated that technology can enhance acquisition of a second language by providing means for creating interactive and adaptable language learning environments, and Kohnke et

al. (2023) indicated that AI tools are beneficial for enhancing spoken English through providing individualized feedback, developing interactive exercises, and modelling pronunciation, resulting in facilitating greater engagement and confidence in spoken language communication. Kohnke et al. (2023) also stated that through exposure to AI tools learners are better equipped to improve fluency, accuracy and confidence when speaking resulting again in facilitating effective oral communications in academic and professional environments.

The document analysis revealed substantial changes in the participant's written communication following sustained AI use. Comparisons of emails, research drafts, proposals, and lecture notes demonstrated improvements in grammatical accuracy, vocabulary sophistication, organisational structure, and explanatory depth. Table 3 summarises the evidence identified across the different document types and the corresponding areas of development.

Table 3. Document Analysis Matrix

Docum ent Type	Pre-AI Evidence	Post-AI Evidence	Develop ment Observed
Emails	Short, informal sentences	Formal academic style	Improved grammar
Research Drafts	Limited vocabulary	Discipline-specific terminology	Vocabulary growth



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Proposals	Basic organization	Clear structure and cohesion	Improved coherence
Lecture Notes	Fragmented explanations	Extended explanations	Greater complexity

Note. *The matrix summarises representative findings from the document analysis comparing the participant's written documents produced before and after sustained AI use. The identified developments reflect the researchers' qualitative analysis of writing features across multiple document types.*

To further illustrate the nature of the participant's writing development, representative excerpts from research writing produced before and after sustained AI use are presented in Table 4. The examples demonstrate improvements in grammatical accuracy, lexical sophistication, sentence complexity, coherence, and overall academic writing style.

Table 4. Research Writing Example

Before AI:	After AI:
This study talks about mathematics and computer science teaching.	This study investigates the influence of AI-assisted learning on pedagogical practices and disciplinary knowledge construction in mathematics and computer science education.

Mathematics is important. Programming is important. Students need both skills. Mathematics and programming are fundamental components of contemporary education.

Furthermore, the integration of these disciplines enables students to develop both analytical and computational competencies.

Students learn computer subjects and mathematics.

Students engage with statistical modelling, algorithmic thinking, computer programming, and database management systems, thereby developing advanced analytical and technological competencies.

Mathematics is important. It helps solve problems. It is useful.

Mathematics provides a foundation for logical reasoning and quantitative analysis; therefore, proficiency in mathematical concepts facilitates effective problem-solving across academic and professional contexts.

Programming is useful. People use it to make software. Many jobs need it.

The importance of programming skills to meet the needs of today's digital workplace cannot be overstated. Digital



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	technology relies heavily on computer programming as an important part of creating new technologies.
Databases store information. They are important for organizations.	Database management systems play a pivotal role in information storage and retrieval; moreover, they facilitate efficient data management and informed decision-making within organizational environments.

Note. The examples are representative excerpts from the participant's research writing before and after sustained AI use. The excerpts were selected to illustrate qualitative changes in grammatical accuracy, vocabulary use, sentence complexity, coherence, and academic writing style identified through the researchers' document analysis. Minor edits were made where necessary to preserve confidentiality without altering the intended meaning.

Through multiple examples, the research shows an increase in academic writing of the participant that was improved by the use of AI-based writing support. Prior to utilising AI, the participant demonstrated relatively simple sentence structure with repetitive vocabulary, weak cohesion, and a descriptive writing style. In many ways, the post-AI examples exhibited

significantly improved linguistic proficiency, conceptual clarity, and adherence to academic convention. For example, the use of explicit research-based vernacular had increased significantly beyond informal usage (e.g., using "talks about" as academic verbs such as "investigates") and more discipline-specific terminology was being used (e.g., "pedagogical practices," "disciplinary knowledge construction," "statistical models," "algorithmic thinking," and "database management systems"). In addition, the participant created better cohesion between text and logical text organisation by adding cohesive devices and transition markers (e.g., "furthermore," "therefore," "consequently," and "moreover"), which improved the clarity of relationship between ideas and enhanced the overall text's coherence. Post-AI writing demonstrated a transition from subjective and generalised statements to more analytical with evidence-based reasoning in support of the building of academic arguments and development of cause-and-effect relationships. The post-AI examples contained an increase in the use of cohesive devices that improved both textual coherence and established clear connections between ideas (e.g., "furthermore," "therefore," "consequently," and "moreover"). Additionally, previously informal language was replaced with formal, precise language to a greater degree, indicating an increased understanding of what an academic audience expects

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and communication within a discipline. Collectively, these examples indicated that the participant's writing progressed from basic descriptive writing to a higher-level academic writing style characterised by improved cohesion, logical progression, lexical sophistication, disciplinary specificity, and increased depth of analysis. The comparative analysis identified observable improvements in grammar, vocabulary choice, sentence complexity, and coherence. This was not interpreted as evidence of total language acquisition, but rather, as evidence of an increased level of language development as a result of extended exposure to AI writing tools.

The findings are consistent with the concepts described in Sociocultural Theory (Vygotsky, 1978). Vygotsky discussed that both exposure and interaction are needed to acquire and develop language skills. The AI tools acted as digital mediators by providing interaction and learning opportunities that develop English language skills via sections of texts, writing feedback and input. Since the participant was not exposed to the target language, he was not comfortable with this language, and as a result, he did not have confidence in using the language even with what he had already acquired. The unavailability of proper language learning methods and the lack of exposure to AI tools made English more challenging for him. He could not write even a simple letter. In addition,

it was impossible for him to present ideas in English. Though the participant's knowledge of the subject was good, he could not present ideas in English due to his lack of proficiency in the English language. Krashen's (1982) Input Hypothesis emphasises that language learners who are exposed to comprehensible input acquire the target language. As the AI tools deliver tailored training inputs, structured inputs, and contextualised inputs, they are likely the cause of the participant's progress in language skills.

Data from interviews and observations supported the findings of document analysis and showed that the participant's confidence in attending conferences, professional meetings, and academic discussions conducted in English had increased. The participant felt less anxiety related to communicating professionally because AI tools provided immediate corrective feedback and allowed for multiple opportunities to practise the language through activities that required its use. The participant desired to learn English for professional use, particularly in research and teaching. After using AI tools, the participant's confidence in producing research papers increased significantly. Prior to using AI tools, the participant did not feel confident participating in professional communication; however, now he feels comfortable communicating in international academia. AI tools greatly aided the participant's anxiety related to language by providing real-time



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feedback and corrective suggestions and by providing a self-directed approach to learning. The findings also provided evidence that the participant was growing more autonomous in his language learning. The participant independently used AI tools to make revisions to drafts, clarify the meaning of vocabulary, practice sentence structure, and create better presentation materials.

The participant asserted:

“Before I began regularly utilising AI tools for writing, I often found it challenging to compose emails and academic research papers in English. I would spend a significant amount of time verifying grammar and vocabulary. Now that I am getting immediate feedback through the use of AI tools, I feel more confident to write letters and papers in English,”

(P01, Senior Lecturer, Male, 50, Interview, 15 March 2025).

The participant further stated:

“Using AI tools also helps me understand how to structure my ideas more logically and use more appropriate academic vocabulary in writing,”

(P01, Senior Lecturer, Male, 50, Interview, 15 March 2025).

These statements support that the participant identified the AI-generated, written communication feedback as

being useful for building his self-confidence and improving his written communication skills.

Observational Recordings

The records were maintained as an ongoing observational record over an 18-month period, documenting changes in the participant's engagement in professional communication. The observations indicated more frequent participation in academic meetings conducted in English, greater willingness to present research findings at conferences, increased independence in drafting professional correspondence, and reduced reliance on colleagues for assistance with language-related issues. These changes suggest a gradual improvement in the participant's confidence and professional communication abilities over the course of the study.

These practices align with sociocultural perspectives that emphasise mediated learning and interaction in language development. These findings further align with (Krashen, 1982; Ellis, 2005). Krashen (1982) emphasized that language learners acquire a language when they are exposed to comprehensible input, language that is slightly beyond their current proficiency level. Krashen further emphasized that exposure to the target language leads to natural acquisition, rather than memorization of rules. Similarly, (Shadieff & Feng, 2024) highlighted the value of opportunities



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for immediate feedback, corrective indicators, and interaction in the development of self-directed, autonomous learning for enhancing learners' accuracy and fluency through real-time feedback and customized support. Ellis (2005) further emphasized that AI tools such as Grammarly and QuillBot provide real-time feedback, help learners refine their writing, avoid errors, and develop grammatical accuracy boosting their confidence in using the target language.

Before exposing to AI tools, the participant had a passive exposure to the English language and did not attend explicit language learning instruction. The participant's increase of attending conferences and international collaborations emphasized the adaptation of AI-supported language acquisition strategies. This is consistent with Syuhra et al. (2025). They highlighted that AI-based language learning techniques inspire to independently interact with and engage with diverse English-speaking communities. Additionally, Vygotsky's (1978), social-cultural theorization reinforces this transformation. When the participant engages in the AI tool that simulates real-life linguistic interactions, it produces scaffolding that allows for learning.

Results from this study provide evidence of the participant's multifaceted development of his

English language use and professional communication skills as a result of sustained interaction with AI-assisted learning tools. The results align with recent findings that generative AI can enhance linguistic acquisition and help improve writing quality and vocabulary development through custom and flexible learning opportunities (Kasneci et al., 2023; Kohnke et al., 2023; Yan, 2023). Document analysis revealed significant improvements in his grammar and sentence structure, indicating increased proficiency in writing; further evidence (written drafts and interviews) of increasing use of academic vocabulary and discipline-specific terms reflects higher levels of sophistication in his vocabulary and a better ability to communicate academically and professionally. Increased confidence was apparent through participant's greater willingness to participate in conferences, academic discussions, and other professional interactions in English, based on observations and interview data. Furthermore, documentation showed increased competence in creating professional communications (email, proposals, presentation) which indicates evidence of a practical transfer of language skills to work-related tasks.

The results demonstrate that while AI tools provide opportunities for developing English as a second language skills through exposure alone, it is insufficient to guarantee full acquisition unless used with

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meaningful interaction. This finding is in accordance with Krashen's (1982) Input Hypothesis which states that in order to develop language skills in a second language, a learner must be exposed to comprehensible input. Furthermore, it can be concluded that it would be impossible to assess whether language acquisition has been successful until a learner interacts in meaningful ways with the target language. Although there were gains in developing reading, writing, speaking, grammar and vocabulary, less progress was made in developing listening and spontaneous speaking from only having exposure to AI tools. There is an overwhelming amount of written input available through exposure to AI tools; however, exposure to speaking and listening cannot solely rely on AI tools because both of these skills depend on having more exposure than what was provided through the use of AI tools. Therefore, the findings suggest that, while there is an increase in development from using AI, exposure to AI alone may not support development in the areas of spontaneous speaking and listening. Additionally, as noted above, human interaction and authentic communicative participation play a vital role in the process of acquiring a second language. In addition, due to the nature of this single case study as exploratory research, the ability to generalise from this study is limited. Furthermore, even though the case study provides an in-depth perspective of AI tool use to acquire English as a

second language, it is limited in generalisability since it is based on one participant. Self-reported experiences provided a great deal of subjectivity to each case, and the length of observation may have not fully captured the true extent of development due to the reliance on generally accepted conventions regarding the developmental process of language acquisition. Therefore, it can be argued that exposure to AI tools provides valuable opportunities for corrective feedback and interactive experiences; however, it may not completely replace the use of human interaction in the acquisition of second language skills, as proposed by Vygotsky (1978).

Although the results described herein are promising, it is prudent to exercise caution with regard to their interpretation. There is a good chance that the participant's previous interest in language learning and his willingness to experiment with new forms of technology had a strong influence on the outcomes observed. In addition, the ways in which the participant engaged with the available resources were key determinants of the types of learning experiences he had. Thus, this study does not assert that the results are universally applicable; instead, it is intended to demonstrate one of many potential uses of AI to enhance the ease of language learning to those who desire.

**Original Article****LIMITATIONS OF THE STUDY**

This research, conducted as a qualitative single-participant case study design, has inherent limitations with regard to generalising findings to other cases. The findings represent only the context in which the research was conducted as opposed to a more generalised population of learners and therefore need to be carefully interpreted as they represent the findings for only one individual. The characteristics of the participant may have also impacted both the learning process and outcomes that were observed. The participant exhibited a high level of motivation, used technology with ease, and had extensive experience with the English language before beginning this research, making it difficult to isolate the effects of AI technology on language development from other factors. Additionally, the use of one case in the study precludes capturing the breadth of variability of learner profiles and access to technology, sociocultural context, and proficiency levels. The lack of a control group and reliance on self-reported data limits the ability to establish strong conclusions about causality. To strengthen the findings of this research future studies would be well-advised to include a larger number of participants and a more diversified sample from other demographic backgrounds and use a mixed-methods or experimental study design to validate and connect to the findings of this study.

CONCLUSION

In summary, the findings from this exploratory case study suggest that the consistent use of AI-assisted learning environments may help develop English language skills for adult ESL students, particularly in the areas of writing, vocabulary development, learner autonomy and professional communication. The study's findings demonstrate that AI tools are being used as mediating resources to give immediate feedback, provide structured practice and allow self-directed learning opportunities. However, the study's findings suggest that AI-assisted learning does not provide enough support to enable students to develop spontaneous oral production (speaking) skills or to replace human interactions with an authentic language experience when acquiring a new language. Furthermore, given the interpretive and exploratory nature of this study, additional research with larger and more diverse cohorts of participants is needed to assess the long-term effects of AI-assisted language acquisition on different education systems and sociocultural contexts.

The findings show that AI tools can significantly facilitate the enhancement of learners' English proficiency when English is a secondary language. The incorporation of AI tools into learners' routines of English language acquisition supports the learners' ability to direct and moderate their own language acquisition process and to



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build their internal language development at an appropriate pace. By ascertaining effective uses of AI tools, educators may be able to identify AI language acquisition limitations and to address these limitations through the use of AI tools as supplemental resources for traditional language instruction, particularly in regard to developing unprepared and spontaneous speech and developing listening skills. Additionally, using AI tools to enhance interactions may contribute as mediators to the interaction-based language learning process. Consequently, these findings contribute to the field of language education and pedagogy. Finally, this study demonstrates the potential for AI tools to play an important role in English language acquisition through exposure to and interaction with AI tools. Learning from AI tools can develop self-efficacy and create autonomous English language users; however, constraints within the relationship of AI to language learning may create challenges, such as excessive dependence and limitations on speaking experiences. Future researchers should seek to examine the effect of AI-exposure on long-term language development trends and to explore the possibilities of integrating AI tools within traditional classroom ESL instruction for an integrative approach to language learning. Additional investigations into the effect of AI exposure on the use of language, particularly in writing and critical thinking, should also be conducted.

Finally, it would be interesting to investigate how the integration of AI tools into the traditional classroom might affect English language learning over time.

References

- Abano, R. C., & Estremera, M. L. (2026). Teaching languages with machines: A systematic review on the effectiveness of AI in ESL learning. *International Journal of Technology in Education*, 9(2), 431–446. <https://ijte.net/index.php/ijte/article/view/5196>
- Ahmadi, M. R. (2018). The use of technology in English language learning: A literature review. *International Journal of Research in English Education*, 3(2), 115–125. <https://doi.org/10.29252/ijree.3.2.115>
- Baranwal, D. (2022). A systematic review of exploring the potential of teachable agents in English learning. *Pedagogical Research*, 7(1).
- Biber, D., Conrad, S., & Reppen, R. (1998). *Corpus linguistics: Investigating language structure and use*. Cambridge University Press.
- Chapelle, C. A. (2001). *Computer applications in second language acquisition: Foundations for teaching, testing, and research*. Cambridge University Press.
- Chen, X., Xie, H., Zou, D., & Hwang, G. J. (2020). Application and theory gaps during the rise of artificial intelligence in education. *Computers and Education: Artificial Intelligence*, 1, Article 100002.
- Cotton, D. R., Cotton, P. A., & Shipway, J. R. (2024). Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. *Innovations in Education and Teaching International*, 61(2), 228–239.
- Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). SAGE Publications.
- Crystal, D. (2003). *English as a global language* (2nd ed.). Cambridge University Press.



Original Article

- Duranti, A., & Goodwin, C. (Eds.). (1992). *Rethinking context: Language as an interactive phenomenon*. Cambridge University Press.
- Ellis, R. (2005). Principles of instructed language learning. *System*, 33(2), 209–224. <https://doi.org/10.1016/j.system.2004.12.006>
- Escalante, J., Pack, A., & Barrett, A. (2023). AI-generated feedback on writing: Insights into efficacy and ENL student preference. *International Journal of Educational Technology in Higher Education*, 20(1), Article 42. <https://doi.org/10.1186/s41239-023-00425-2>
- Gilakjani, A. P. (2017). The significance of pronunciation in English language teaching. *English Language Teaching*, 10(3), 96–105.
- Grabe, W., & Stoller, F. L. (2002). *Teaching and researching reading*. Routledge.
- Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education: Promises and implications for teaching and learning*. Center for Curriculum Redesign.
- Kannan, J., & Munday, P. (2018). New trends in second language learning and teaching through the lens of ICT, networked learning, and artificial intelligence. *Círculo de Lingüística Aplicada a la Comunicación*, 76, 13–30. <https://doi.org/10.5209/CLAC.62495>
- Kasirzadeh, A., & Gabriel, I. (2023). In conversation with artificial intelligence: Aligning language models with human values. *Philosophy & Technology*, 36(2), Article 27.
- Kasneci, E., Seßler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günemann, S., Hüllermeier, E., Krusche, S., Kutyniok, G., Michaeli, T., Nerdel, C., Pfeffer, J., Poquet, O., Sailer, M., Schmidt, A., Seidel, T., & Kasneci, G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences*, 103, Article 102274. <https://doi.org/10.1016/j.lindif.2023.102274>
- Kohnke, L., Moorhouse, B. L., & Zou, D. (2023). ChatGPT for language teaching and learning. *RELC Journal*, 54(2), 537–550. <https://doi.org/10.1177/00336882231162868>
- Kormos, J. (2023). The role of cognitive factors in second language writing and writing to learn a second language. *Studies in Second Language Acquisition*, 45(3), 622–646.
- Krashen, S. D. (1982). *Principles and practice in second language acquisition*. Pergamon Press.
- Lan, Y.-J., Sung, Y.-T., & Chang, K.-E. (2020). Communicative language teaching and English as a foreign language undergraduates' communicative competence in Tourism English. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 27, 100271.
- Larsen-Freeman, D., & Anderson, M. (2011). *Techniques and principles in language teaching* (3rd ed.). Oxford University Press.
- Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence unleashed: An argument for AI in education*. Pearson.
- McCarthy, J., Minsky, M. L., Rochester, N., & Shannon, C. E. (2006). A proposal for the Dartmouth summer research project on artificial intelligence, August 31, 1955. *AI Magazine*, 27(4), 12–12.
- Merriam, S. B. (1998). *Qualitative research and case study applications in education* (2nd ed.). Jossey-Bass.
- Nilsson, N. J. (2009). *The quest for artificial intelligence*. Cambridge University Press.
- Pannu, A. (2015). Artificial intelligence and its application in education. *International Journal of Advanced Research in Computer Science*, 6(3), 324–329.
- Patton, M. Q. (2002). Two decades of developments in qualitative inquiry: A personal, experiential perspective. *Qualitative Social Work*, 1(3), 261–283. <https://doi.org/10.1177/1473325002001003636>



Original Article

- Perkins, M. (2023). Academic integrity considerations of AI large language models in the post-pandemic era: ChatGPT and beyond. *Journal of University Teaching and Learning Practice*, 20(2), 1–24.
- Qi, A. Y., Yunus, M. M., & Lun, C. W. W. (2025). Enhancing English reading skills through AI-based tools: A systematic review. *Quantum Journal of Social Sciences and Humanities*, 6(6), 373–390.
- Qiao, S., Gu, M. M., & Lu, C. (2025). Artificial intelligence for language learning: A systematic review of its design, theoretical foundations, implementation, and impact. *International Journal of Applied Linguistics*. Advance online publication. <https://doi.org/10.1111/ijal.7003>
- Rahman, G., Mudhsh, B. A., Almutairi, M., & Kouki, M. (2025). Optimizing ESL learners' speech act performance: The role of AI-powered chatbots in pragmatic competence development. *Theory and Practice in Language Studies*, 15(10).
- Russell, S. J., & Norvig, P. (2021). *Artificial intelligence: A modern approach* (4th ed.). Pearson.
- Shadiev, R., & Liu, J. (2023). Review of research on applications of speech recognition technology to assist language learning. *ReCALL*, 35(1), 74–88.
- Shadiev, R., & Feng, Y. (2024). Using automated corrective feedback tools in language learning: a review study. *Interactive learning environments*, 32(6), 2538–2566.
- Song, Y., Song, N., & Luo, J. (2026). Impact of AI-assisted learning on EFL vocabulary acquisition: A study based on Technology Acceptance Model. *Journal of Educational Technology and Innovation*, 8(2).
- Stake, R. E. (1995). *The art of case study research*. SAGE Publications.
- Syuhra, M. N., Chandra, N. E., & Rosalina, E. (2025). Artificial intelligence in English language teaching: A systematic literature review of tools, impact, and challenges. *Voices of English Language Education Society*, 9(1), 193–205.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Wiboolyasarin, K., & Jinowat, N. (2025). AI-powered feedback in second language writing: A systematic scoping review of technological innovations in digital language education. *International Journal of Language Studies*, 19(4).
- Yan, D. (2023). Impact of ChatGPT on learners in a L2 writing practicum: An exploratory investigation. *Education and Information Technologies*, 28(11), 13943–13967. <https://doi.org/10.1007/s10639-023-11742-4>
- Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). SAGE Publications.
- Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education—where are the educators? *International Journal of Educational Technology in Higher Education*, 16(1), Article 39.