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THE EFFECTS OF ARTIFICIAL INTELLIGENCE ON THE ENGLISH WRITING SKILLS OF ESL STUDENTS AT RAHIM YAR KHAN

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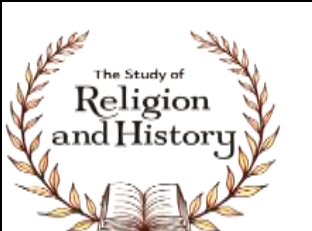
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Abstract

This study aims at analyzing the impact of Artificial Intelligence (AI) Writing Tools on the English Writing Skill of English as a Second Language (ESL) learner of Rahim Yar Khan, Pakistan. The study was spurred by the growing adoption of AI in learning and the surging demand for affordable language-learning options in resource-poor areas. The study was conducted with a mixed-method design, collecting quantitative data through a pre-test and post-test conducted with 100 ESL learners, and collecting qualitative data through semi-structured interviews with 20 of the ESL learners. The quantitative results revealed that there were statistically significant improvements in four most important writing skills, with the largest improvements in grammar accuracy and sentence coherence. Qualitative data analysis revealed that learner confidence, writing apprehension and self-knowingness of writing were increased with the thematic coding of the qualitative data. Over-reliance on AI tools and lessened critical thinking were among the cautions raised as well. Evidence supports that AI composing tools can be useful adjuncts to conventional ESL teaching, particularly in educationally disadvantaged contexts. The study concludes with pedagogical implications for ESL and guidelines for the effective integration of AI tools without sacrificing learner agency and analytical skill-building. This study works towards advocating for greater equity in education with new creative and inexpensive ways to enhance ESL writing education and student outcomes particularly in less privileged contexts such as Rahim Yar Khan, Pakistan.

Introduction

The recent advent of Artificial Intelligence (AI) for instructional practices has changed the traditional classroom, especially for language learning in recent years. The development of

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writing competence is perhaps the most essential domain in which AI has exhibited real-world value. A second-language writer must acquire complex linguistic components such as grammar, vocabulary, coherence and cohesion, and organization. For example, English as a Second Language (ESL) writers experience increasing complexity and, for those writing in limited-resource environments such as Rahim Yar Khan, Pakistan, these complexities become even more arduous due to weak instructional scaffolding, language interference from local dialects, and limited language exposure and experience with English writing procedures (Abbas, 2023). AI-supported writing programs (e.g., Grammarly, Hemingway Editor, ProWritingAid) offer more than reasonable alternatives by providing immediate, personalized, and usable feedback pertaining to grammar, punctuation, word choice, and sentence structure. The computer programs are based on Natural Language Processing (NLP) and related machine learning techniques, allowing the software to recognize common errors in writing and provide immediate feedback in real time (Wang et al., 2023). Grammarly - which highlights surface errors such as punctuation and spelling but also provides intelligent suggestions - identifies errors in tone, clarity, and engagement appropriateness that are significant components of academic writing (Abu Qub'a et al., 2024). For ESL students in Rahim Yar Khan, AI tools can act as supplementary teachers, offering feedback that would normally require large class sizes, limited amounts of teachers, or not feedback opportunities in traditional classrooms. These AI tools create a no-risk environment where students can engage with the language, revise their writing anonymously, and build their comfort level and self-advocacy skills when expressing themselves in English, incrementally (Abu Qub'a et al., 2024). Learners that have anxiety about writing, or who are apprehensive to be evaluated by their peers, should find an engaging and relevant writing space, with AI feedback and anonymity. Even with the advantages of AI writing technologies, anxieties remain about the future pedagogic impact of AI. Some researchers have pointed to the increased use of AI-driven corrections, as opposed to learner corrections, could hinder learner's abilities toward editing their own writing and using critical thinking skills (Zhai et al., 2024). In addition, most research publications are occurring in technologically advanced or urban schools or organizations, and these research studies have created an overwhelming gap in knowledge on what happens in semi-urban or rural areas, such as Rahim Yar Khan, where the profiles and types of digital literacy, internet access, and teacher-student's interactions are all different.

Given those facts, it is important to explore how ESL learners in Rahim Yar Khan employ AI writing tools, the concrete advantages of those tools to their writing skills, and how students view the impact of the tools. This research will fill that gap by examining the efficacy and shortcomings of AI-assisted writing among English as Second Language (ESL) learners in this region. In doing so, it will evaluate whether AI tools can really serve as effective enhancements to traditional pedagogies, especially in situations where the educational infrastructure is lacking, but access to digital technology is getting larger. For teachers, learners and policy makers of the second language, this is a real important study specially in the underprivileged areas like Rahim Yar Khan. The study explores the impact of AI-powered writing tools on the writing abilities of ESL learners and addresses a significant gap in the broader literature. The previous research on

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the role of AI in L2 learning was conducted in urban or technologically advanced environment, and some of these studies are lacking in considering the socio-educational environment of students in rural or semi-urban Pakistan. This study can therefore provide useful insights to determine if such programs as Grammarly and ProWritingAid could be used as an aid to learning for a class like an ESL class where there is limited assistance from the teacher. It will also reveal how these tools affect the learner's grammar, vocabulary, coherence and the whole development of academic writing, thus providing more effective teaching strategies that really enhance the learner's writing performance.

Literature Review

Artificial Intelligence (AI) is a game-changing technology that mimics human actions through algorithms and computational methods. Some examples of this are machine learning (ML), natural language processing (NLP), and deep learning, and by using AI we can enable machines to do things like understand, reason and make decisions. Soori et al. (2023) explained that AI has emerged as a game-changing capability across many fields including education, especially where it enhances personalized learning, adaptive instruction, and automated feedback. In language acquisition, AI has been a very effective educational tool in addressing the variable needs of students, especially when learning English as a Second Language (ESL) (Ling, 2023). The use of AI in education is a potential means of supporting the distinctive learning requirements of students in real-time. For ESL learners, artificial intelligence presents the potential of closing language gaps, improving language capacities, and developing necessary skills, such as writing (Ling, 2023). AI embedded skills use the capabilities of NLP in analyzing text, finding errors, and providing options for improvement. These skills have value for students and instructors alike, since they make learning more accessible and contribute to improved learning quality. As mentioned by Mohamed et al. (2024), the implementation of AI in education lies beyond technical support, and can likewise be motivational and engaging for learners. When providing immediate feedback and personalized learning experiences, AI motivates learners to engage in their learning. By developing learner engagement, AI is important in terms of ESL learners, as they face unique circumstances when learning a new language. AI capabilities support ESL learners in overcoming barriers, building self-efficacy, and developing the skill sets necessary to conduct themselves in academic and work contexts.

AI Software Applications

AI (artificial intelligence) writing tools have changed the landscape of writing, learning, and teaching. AI tools provide immediate feedback regarding grammar, vocabulary, sentence structure, and more, enabling learners to identify and fix their mistakes as they write (Putra, 2023). Additionally, AI writing tools offer personalized and adaptive support, making them ideal tools for writing development, especially for ESL (English as a Second Language) students. The most popular AI writing tools include Grammarly, ProWritingAid, and the Hemingway Editor. Grammarly is one of the most well-known AI writing assistants. Grammarly is known for its contextual real-time grammar, punctuation, word choice, and style suggestions. Grammarly uses sophisticated natural language processing (NLP) algorithms to analyze writing and make context-based suggestions. Grammarly helps ESL students address the most common writing

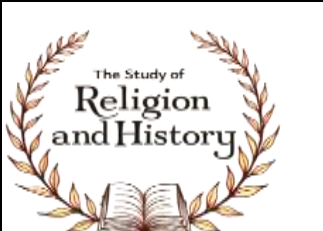
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weaknesses such as subject-verb agreement, sentence fragments, and word choice (Tran, 2025). Research has shown that Grammarly significantly improves the quality of students' writing by increasing clarity, coherence, and grammatical accuracy. For example, Tran (2025) found that students who used Grammarly significantly increased their writing quantity focusing on sentence form and word choice.

Unlike Grammarly, which stresses grammatical and vocabulary rules, ProWritingAid offers in-depth reports on different elements of writing, including sentence structure, use of words, and stylistic elements. This makes it a worthwhile competence for students to want to sharpen their writing skills, and become more refined and professional writers (Fitria, 2023). Studies have confirmed ProWritingAid to be effective in upgrading students' writing skills. For example, in a study by Fitria (2023), she showed that ProWritingAid was especially superior in shaping the students as better and more competent writers. Hemingway Editor also serves to improve the readability and comprehensibility of one's work through the encouragement of using a more direct and straightforward writing style. It highlights complex sentences, passive voice, and adverb heavy writing, subsequently helping authors to write clean and concise text. It may not have the same functionality and features as Grammarly or ProWritingAid, however, the Hemingway Editor is an excellent technology for ESL learners who may struggle with wordiness and complex sentences (Chesson, 2023). Several studies have suggested Hemingway Editor was effective at improving the readability of technical and academic texts, and also made them more accessible to readers.

Restrictions of AI Writing Skills

AI writing tools are characterized by similar limitations in addressing context-based nuances, cultural differences, and the creativity aspect of writing; the first limitations speak to their inability to address higher-order writing skills, in addition to their limited assistance in specified contexts. For example, although Khalifa and Albadawy (2024) claim that AI writing tools do successfully address grammatical mistakes and sentence structure harms, they find it very hard to provide constructed feedback on higher-order writing skills, such as argumentation, critical thinking and creativity (Aijun, 2024). Computer programs for AI are often developed for a generic application and may not cater to the individual needs of ESL students from diverse linguistic and cultural backgrounds. Feedback in such instances may not be contextually useful or culturally correct. For example, Mohammed & Khalid (2025) say that an AI program can offer grammatically correct changes to a sentence without considering the cultural or rhetorical norms of the learner's first language. This limitation shows why it still needs human intervention to give more context sensitive and sort of nuanced feedback. Another major disadvantage of AI writing tool is that people become overly reliant on them. This is because those who rely on AI for error correction are likely to become less proficient in writing. This is because individuals who use AI for error correction will most likely not grow into writers. This kind of dependence also makes it difficult for them to detect and rectify mistakes themselves, a very important aspect of language learning. When a person depends excessively on any AI software, it can result in a decline of critical thinking and problem-solving skills, according to Ellis et al. (2020), as they are not actually learning.

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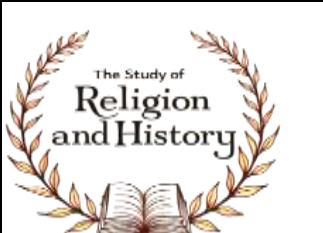
Role in ESL Education

Artificial Intelligence (AI) programs have now started to become essential in the English as a Second Language (ESL) teaching process, particularly in fostering writing skills. These types of programs often provide personalized feedback, include engaging activities for learning, and may offer adaptive assistance, making them valuable in helping ESL students manage the unique demands of acquiring the language (as noted in Khan et al., 2024). AI can eliminate the most frequent writing barriers, boost confidence, and over time improve students' English language proficiency. Still, it's also important to be careful here, because the success of AI in ESL can't really be overstated as if it's the whole story about the student's learning (Khan et al., 2024). So, to maximize the "scope" of AI, we need to reach some balance between AI-assisted learning and more traditional approaches. One of the main advantages of AI computing programs in ESL instruction is that they can provide personalized feedback. As Widiati et al. (2023) state, whereas in a normal classroom setting, teachers are not able to provide one-on-one feedback to every student, AI programs can take the time to read through every student's writing and give them feedback about how to get better. For example, programs such as Grammarly and ProWritingAid highlight grammatical errors, suggest better word choices, and offer sentence improvement suggestions. This individualized feedback helps ESL students to be cognizant of and work on their own weaknesses, such as subject-verb agreement, sentence fragments, and choice of words, which are often determined by the patterns of their home language (Satake, 2024).

Language practice software applications based on artificial intelligence can not only help with language practice, but also create dynamic learning scenarios with a certain sense of touch for ESL learners. These tools sort of 'remind' students that they are involved in the writing process, rather than just watching, through progress tracking, play-based rewards, and setting targets. For instance, like Grammarly, they can target specific writing goals, like making your writing stronger, clearer, or more formal, and then receive progress reports indicating what is improving. Putra (2023) states that those elements are able to inspire students to be responsible for their learning and continue to strive for improvement, even if it is not easy and takes a long time. Writing is the area that is the most challenging for ESL students. They may have difficulty organizing their thoughts, following grammatical rules and choosing words that make sense. These problems often exacerbate in the absence of much English outside of class and with the interference of L1. The use of AI computer tools can be particularly helpful, as they can provide instant feedback for students to refer to immediately. For example, ProWritingAid offers writing style, readability, and coherence reports. Therefore, learners can edit their works towards making ideal works of what they have written (Fitria, 2023).

Academic Writing

Academic writing is formal writing in the context of learning and research. It includes evidence-based arguments, critical thinking and conventions like citation format and style. The learners in this study were ESL learners, and sometimes they have difficulties in academic writing because they have no experience of the academic conventions and academic writing such as writing organized essay and academic research study (Rachmawati & Fadhilawati, 2024). Clarity, coherence, and organization suggestions are just a few ways in which AI skills can boost

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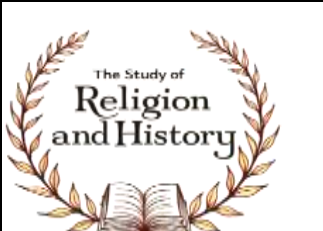
academic writing. For instance, ProWritingAid provides extensive sentence structure, readability, style reports to improve students' academic writing.

Nevertheless, according to Pervaiz et al. (2025), AI skills are not as effective in handling higher-order writing skills, such as argumentation and critical analysis, which require human intervention and guidance. Formal academic writing styles vary greatly from when students demonstrate their purpose and or interest, and cultural perspectives. Some students place importance on clarity and accuracy, while others place importance on creativity and originality. AI functions can be adapted to these styles, as the feedback can be flexible. For example, Grammarly allows users to establish tone, formality, and purpose goals, which let students adapt their writing to context (Tran, 2025). Yet, AI skills are not able to account for personal preferences through students' ability to grasp and utilize the feedback. As highlighted by Maphoto et al. (2024), some students have critically defined AI skills, as too didactic, as it restricts students' ability to access alternative forms of writing style and expression.

English Writing Skills and AI

English writing instruction with Artificial Intelligence (AI) incorporated has revolutionised how students, especially ESL learners, acquire writing skills. AI skills offer immediate feedback, personalised learning, and adaptive assistance and thus are assets to enhance grammar, vocabulary, coherence, and general writing abilities. This part discusses the impact of AI on English writing abilities, the problems encountered during the AI era, teaching methods, and the characteristics of AI skills that support writing instruction. English writing skills have also been improved by AI abilities by correcting for some of the most prevalent issues ESL students have. AI abilities give immediate feedback on sentence organisation, punctuation, and grammar, enabling students to identify and correct errors instantly. Students who used AI abilities like Grammarly and ProWritingAid improved dramatically in writing accuracy, coherence, and vocabulary use (Tran, 2025). Among the key strengths of AI features is their ability to personalize feedback based on personal needs. Grammarly, for instance, offers personalized suggestions for improving tone, clarity, and interest, while ProWritingAid provides detailed reports on writing style and readability. These features help students learn more about writing conventions and become better competent (Fitria, 2023). Challenges of EWS in the AI Era

While AI abilities have many benefits, they also create problems for ESL learners and instructors. Forming a top concern is the risk of overreliance on AI skills that can inhibit the use of independent writing abilities. As noted, in accordance with Zhai et al. (2024), students who overdepend on AI competence to check and correct errors do not necessarily attain critical thinking and problem-solving abilities because they are unable to detect and correct errors without assistance. A second challenge is that AI competence is incapable of handling higher-order composition skills, including argumentation, critical thinking, and creativity. AI features are effective in identifying grammatical errors and rephrasing sentences, but are not always up to the challenge of offering actionable critique on more sophisticated writing assignments. For instance, Saira et al. (2025) noted that AI features are weak at determining if arguments made in written scholarly work are convincing and coherent. Linguistic and cultural differences also present challenges for ESL writers using AI features. Many of the AI features are created for

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native speakers of English and may not be aware of the unique needs and challenges of ESL learners. This may result in uncontextualized or culturally appropriate responses which mean these features have less utility (Saira et al., 2025).

AI-Based Feedback on Study Writings

Feedback is a fundamental part of writing instruction and the capabilities of AI present a unique opportunity for short feedback and supportive feedback to students. AI-enabled tools such as Grammarly and ProWritingAid are capable of scanning students' writing in real time and noting flaws, with suggestions for rectification. In addition, students can learn from their mistakes and are likely to develop a more beneficial writing style over time through real-time feedback (Clugston, 2024). Perhaps the greatest advantage of AI-enabled feedback is its consistency and impartiality. Human feedback can, at times, be reliant on subjective factors. AI capabilities can provide systemic feedback based on pre-articulated algorithms. AI-enabled feedback is particularly useful for ESL learners because of its systemization. Each learner receives the same level of support, regardless of proficiency (Khan et al. 2024). Despite these benefits, AI capabilities are limited. For example, AI capabilities may struggle to provide context-driven comments related to complex writing skills: argumentation, critical thinking and creativity. Escalante et al (2023) also affirm other students will find AI feedback overly prescriptive, preventing them from examining other styles and approaches. To correct such limitations, teachers ought to supplement feedback from AI with that of human beings. For example, teachers can review students' work after utilizing AI features and add further comments on areas that the features might have failed to address (Satake, 2024).

Research Methodology

Research Design

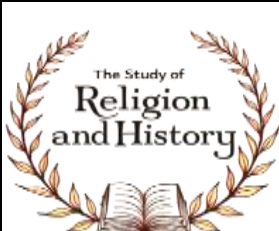
The study adopted mixed-methods design to examine the impact of the use of Artificial Intelligence (AI) writing tools on the writing habits of ESL learners in Rahim Yar Khan. It contained both qualitative and quantitative data collection and analysis. The quantitative part employed the pre-test/post-test design, with students' writing being assessed before and following three months of using the AI tools (Grammarly and ProWritingAid). The qualitative aspect featured semi-structured interviews to gain insights into participants' experiences and attitudes related to AI writing support. This method allowed for a full understanding of the effect of AI on grammar, vocabulary, clarity, and writing confidence in ESL writing development.

Population of the Study

For this study, ESL students of different educational organizations were taken from Rahim Yar Khan, such as government colleges, private language schools, universities with English departments, etc. The participants were very varied in their English proficiency, education, technological experience, etc. This population was chosen because it is relevant to the aims of the study, because it is dealing with pedagogical, linguistic and technological issues that are different from what happens in traditional education.

Sample and Sampling Technique

A stratified random sampling technique was used in Rahim Yar Khan educational institutions to get a representative sample of 100 ESL students (Adeoye, 2023). Stratification was performed

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for key factors such as gender, experience with AI writing tools, and level of English language proficiency (beginner, intermediate and advanced). By adding variation to the sample, the researcher was able to take into consideration factors that might affect writing performance. Subjects were selected randomly in each stratum to reduce selection bias and ensure the results were as reliable as possible.

Data Collection Methods

The study tried to explore how AI writing software affects the English writing proficiency of ESL learners in Rahim Yar Khan using quantitative and qualitative data collection techniques. 100 participants took a pre-test and post-test to measure grammar, sentence structure and writing organization, which was also assessed according to a standard rubric. After some training of the students on the use of tools such as Grammarly and ProWritingAid, they used such tools in their assignments for three months and the use of these tools was monitored. The key indicator of improvement was the difference in test scores and these were analyzed statistically. In addition, a purposive sample of 20 students, across English-language proficiency levels, was interviewed to gain qualitative data on their experiences, attitudes, and problems with the AI tools, in either English or Urdu.

Data Analysis Methods

The impact of AI composition tools on the writing competence of ESL students was collected quantitatively and qualitatively for further analysis. The quantitative aspect entailed analyzing pre-test and post-test scores of 100 students using SPSS with a paired sample t-test to assess the differences between their writing skills before and after the intervention based on different parameters to check the accuracy of grammar, range of vocabulary, and sentence structure. Qualitative data was collected in semi-structured interviews with 20 students and analyzed for themes, which included themes of self-correction, decreased anxiety, dependence upon tools, and improved clarity of writing. This holistic approach gave a complete vision of the effectiveness and experiential impacts of AI writing tools on ESL students in Rahim Yar Khan.

Ethical Considerations

This research was done in an ethical manner, with the utmost care taken to respect the rights of the participants in ethical research procedures. The entire research proposal was reviewed and cleared by the IRB prior to beginning data collection to make sure that the study passed academic as well as ethical standards. The purpose, content, and voluntary nature of the study were explained to all participants. Each subject in the study signed an informed consent form which guarantees of confidentiality. Additionally, the study's use of AI writing tools were limited to research and teaching. All these measures allowed the study to be carried out in the highest moral standards.

Findings

The results not only show statistically significant improvements in writing skills but also the students' confidence level and the difficulties they encountered during the intervention process, providing students with a broad spectrum of understanding of how AI tools can support the writing skills of students.

Qualitative Data Analysis

This provides quantitative data analysis which was gathered in a pre-test and post-test design with 100 ESL students at Rahim Yar Khan. The intention was to find out whether the addition of AI writing software (ProWritingAid and Grammarly) brought statistically significant improvement in the writing skills of the students over a three-month intervention period. The two tests were marked according to a rubric that evaluated students' performance in the four writing skill areas: grammar correctness (30 marks), vocabulary sophistication (20 marks), sentence structure and coherence (30 marks), and organization and presentation (20 marks). The rubric provided consistency and equality in marking each student's work, and allowed for a valid comparison of the pre-intervention and post-intervention scores.

Descriptive Analysis

Participant Demographics

Table 1: Participant Demographics Overview (N = 100)

Category	Sub-category	Frequency (n)	Percentage (%)
Gender	Male	48	48%
	Female	52	52%
Age Group	18–22 years	64	64%
	23–26 years	26	26%
	Above 26 years	10	10%
English Proficiency	Beginner	32	32%
	Intermediate	38	38%
	Advanced	30	30%
AI Writing Tool Usage	No prior experience	29	29%
	Occasional user	41	41%
	Frequent/structured user	30	30%

Analysis of the demographics of the study participants highlights that the samples are evenly divided in order to make sure that reliable results can be obtained using the mixed method approach. A total of 48 men and 52 women have been recruited, thus enabling the control of gender writing perceptions in the study without making any comparisons in the same. The age group consisted of 64% students from 18 to 22 years, who were typical attendees of language institutes, as well as 36% who were older and had added to the qualitative information available with the experience they had accumulated over time. Concerning the proficiency levels, there

was a maximum number of intermediate learners, followed by beginners and advanced learners. While 38% were intermediate learners, 32% were beginners, and 30% were advanced English users, thus helping to measure the effect of AI tools across different proficiency groups. The previous users of these tools were also evenly spread in the sample.

Comparative Analysis: Pre-test vs. Post-test Results

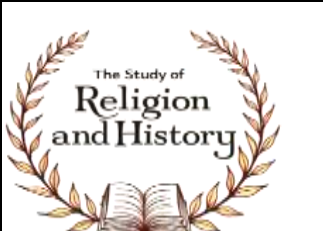
Table 2: Comparison of Pre-test and Post-test Mean Scores (n = 100)

Writing Component	Max Marks	Pre-test Mean (SD)	Post-test Mean (SD)	Mean Difference	t-value	p-value
Grammar Accuracy	30	17.8 (±3.4)	23.4 (±2.9)	5.6	11.27	0
Vocabulary Usage	20	12.3 (±2.5)	15.7 (±2.1)	3.4	10.65	0
Sentence Coherence	30	15.9 (±3.1)	22.1 (±2.7)	6.2	12.83	0
Organization & Presentation	20	20.1 (±1.7)	21.3 (±1.4)	1.2	4.51	0
Total Score	100	66.1 (±5.2)	82.5 (±4.8)	16.4	15.34	0

The study shows that ESL students' writing skills really improved after about three months of using AI tools, with an average score going up 16.4 points, and there is clear evidence of statistically significant progress too ($p < 0.001$). This will be evident to you in terms of grammar, coherence, vocabulary, and organization, in a kind of way all at once. What stands out most is the grammatical enhancement, especially with subject-verb agreement, plus the overall clarity of their writing, as seen in corrections suggested by tools such as Grammarly and ProWritingAid. There has also been a marked improvement in sentence coherence, largely due to students' improved use of paragraphing and more effective transitions, and as a result, better presentation of ideas in a logical way. Word enrichment also occurred. A certain degree of "choice of synonyms" was encouraged in the sense that certain tools enabled students to choose synonyms that suited the context; and there was also a level of "self-awareness of word usage" that was encouraged. The improvements made in organization were minimal but AI tools still encouraged students to adopt more logical essay structures when compared to the rest. Overall, these results confirm the effectiveness of AI writing tools and, in particular, their ability to enhance writing skills in the areas that are typically most challenging for second-language learners, suggesting that they might work alongside conventional ESL training. This can be particularly promising in areas with a need for additional support where it is otherwise scarce.

Thematic Analysis

The interviews were transcribed verbatim, and then analyzed thematically for key themes, in relation to the learners' experience, their attitude and what they thought the effect of AI tools was

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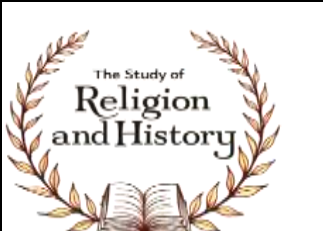
on their writing ability. Here, the findings from the thematic analysis are roughly divided into main themes with each theme accompanied by direct quotes from the participants, and linked to the research questions of this study and its objectives.

Awareness and Correction of Grammatical Errors

Based on these qualitative interviews, it would appear that one of the main themes is that ESL learners' grammatical awareness and their tendency to self-correct slightly increase when using AI writing tools such as Grammarly and ProWritingAid. Many participants reported that the tools provide immediate feedback, helping students more quickly realize the rules, and they also reported a reduction in the same type of errors, particularly those involving subject-verb agreement, tense selection, using prepositions, and using articles. In the first instance, one student explained how Grammarly transformed the sentence from “He go to school” to “He goes”. It's not just a fix-it program, that example demonstrates it can be an educational assistant too. Moreover, AI seems to contribute to an average score improvement of 5.6 points in grammar accuracy and responds quickly as compared to teachers who may offer corrections later, keeping learners in active learning mode. In addition to the metrics, students noted that the AI responses were non-judgmental and appreciated them. It did not seem like it was judging them; therefore they did not feel as anxious as they sometimes did when they got the correction in the regular classroom; and this left them more confident in using grammar. The results indicate that these AI writing tools are able to address persistent grammatical issues with success and provide more targeted guidance, essentially addressing a need that is common among ESL learners in areas with less support available.

Vocabulary Development and Lexical Variation

Pupils who reported using AI writing tools like Grammarly and ProWritingAid indicated that they had noticeable improvements in their word choice, word variety, and word selection that matched the meaning. This also has to do with coherence, hence, it is not superficial. Initially, it seemed that ESL learners were relying on fairly limited vocabulary choices, using words such as “good” and “very” more than they probably should have been, as if they were “default” words. They were aided by AI resources, received contextual suggestions, which broadened the vocabulary, and were able to select more precisely academic terminology. Some participants reported that they could be alerted to the use of ambiguous phrases within the software and then provided with more concrete options, facilitating clearer communication in their own writing, and adding to the diversity of their vocabulary, which they used right away. For instance, one learner changed from “very important” to “significant” due to the tool's recommendation. The findings confirm that AI tools can serve as lexical scaffolds, helping learners progress in their language use. Students also seemed to appreciate the brief comments that accompanied the word suggestions, as these notes alerted them to tone/register variations. Therefore, the scores for vocabulary use increased by an average of 3.4 points post intervention, implying a positive impact on vocabulary development, particularly for the intermediate learners who required additional polishing in an academic context.

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Reduced Writing Anxiety and Improved Confidence

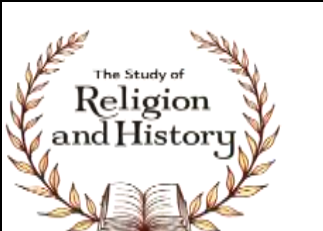
The second theme that emerged in this qualitative data was the psychological impact of AI writing tools on ESL learners, particularly in addressing writing anxiety and fostering the students' confidence in writing. In conclusion, the use of AI writing tools appears to have a positive effect on ESL learners, helping to alleviate anxiety and build confidence in writing. Many students before using the tools talked about being afraid when writing, primarily due to uncertainty about grammar and word choice. However, following a normal use for 3 months, this anxiety diminished and they became more inclined to write. They reported enjoying the judgement-free atmosphere of feedback, and that it was easier than the norm of feedback. In a sense the tools were like reliable coaches; they were able to prompt students to engage in the process of writing, instead of just relying on the teacher to prompt them. Psychologically, it helps to improve the feeling of belonging to and being independent in classes in relation to assignments. All in all, the findings suggest that AI tools can not only enhance the quality of writing but also boost self-confidence and motivation among language learners.

Supportive but Not a Replacement for Teachers

The interviews reveal that AI writing tools, such as Grammarly and ProWritingAid, are perceived more as an assistant or complement, rather than a substitute for human teachers in the field of ESL instruction. Students appear to enjoy the instant feedback these instruments provide, particularly when teachers are not present or just can't be reached. Nonetheless, many participants noted that AI does not excel with detailed reasoning, emotional reassurance, or the sorts of personal coaching that often come in the form of writing. Yes, AI can provide the surface-level fixes, but it doesn't match the context-sensitive, encouraging and personalized approaches that teachers can provide. In another sense, the results are congruent with previous studies as well because these AI tools are not meant to replace traditional teaching but rather complement it. Which essentially has the light focused on how important teachers are to developing students' genuine understanding and motivation.

Discussion of Findings

The findings drawn from this research are that incorporation of AI writing software, namely Grammarly and ProWritingAid, positively affected the English writing skills of ESL students in Rahim Yar Khan. Pre-test and post-test quantitative analysis showed quantifiable gains in grammar, vocabulary, sentence clarity, and organization in all proficiency levels. These gains were highest in sentence structure and grammar, at 5.6 and 6.2 points on average. These findings are consistent with those of Marzuki et al. (2023) and Chen et al. (2020), who concluded that AI-powered feedback software enables language learners to self-correct through repeated exposure and interactive stimulus, thereby accelerating grammatical competence and syntactic simplicity. The participants continued to reassert that AI materials created a low-pressure environment where they could write and revise without criticism or embarrassment. This supports Owan et al. (2023) and Aziz & Kashinathan's (2021) findings that technology-enhanced learning provides a psychologically safe space that reduces language-based stress and encourages risk-taking. The use of AI tools also led to substantial lexical development, with the majority of the students reporting they learned to expand their vocabulary range and develop

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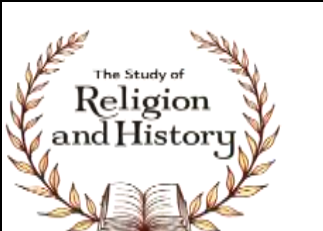
their scholarly voice. Such tools suggested more precise synonyms, pointed out wordiness, and provided contextual guidance that allowed students to move away from simpler words. As Gayed et al. (2022) and others have pointed out, AI tools can act as lexical scaffolds that facilitate ESL learners to expand both active and passive vocabulary by exposure to high-frequency academic words in context. This was also clearly seen in the post-test scores with vocabulary improving on average by 3.4 points, as well as in students' descriptions of replacing common words with more sophisticated equivalents such as 'substantial' or 'beneficial'. However, the primary points that emerged from the interviews or the performance post-test were the dangers of relying heavily on AI, which can sometimes be a weaker critical thinking. Despite these drawbacks, students either more or less saw AI tools as a supplement to traditional education rather than a replacement for it. The majority highlighted that AI assisted them with grammar and vocabulary, but teachers remained vital sources of input for content, advice, argument structure, and interpretation of feedback. This is in line with the findings of Chen et al. (2020) and Luo (2022) that ESL learning should adopt a mixed method by incorporating AI technologies as assistants with teacher-led strategic instruction. Teachers' affective support, contextual discernment, and personalized feedback, however, were not, in any real sense, replaceable, particularly in culturally plural and linguistically diverse context like Rahim Yar Khan.

Conclusion

The study explores the impact of such AI writing software on the writing skills of ESL students in Rahim Yar Khan through a mixed method approach with a combination of numbers and voices. There are 100 students who take pre- and post-tests. During the qualitative component, 20 participants are interviewed and therefore the research gets a more complete picture. The overall results indicate positive progress areas such as grammar, vocabulary, coherence, and even writing self-efficacy. The AI tools provide instant feedback, enabling students to pay more attention to grammar and, at the same time, to grasp the organization of the text. This, in turn, helps in second language acquisition. However, even if students reported that the feedback made them feel more confident, there were some complaints from students, such as relying heavily on the AI. This dependence can weaken or diminish critical thinking skills, if not in actuality. In the end, the research merely reinforces the importance of human instructors as emotional anchors and guides, alongside AI tools, to enhance the writing experience for ESL learners.

Recommendations

Teachers in ESL classrooms can leverage AI writing tools like Grammarly and ProWritingAid as supplementary tools to help them get the most out of the learning environment. In practice, that will involve creating assignments to challenge learners to analyze the feedback that the AI generates. It is important to encourage students to question before taking some of the suggestions for granted, or to quickly move on to studying the suggestions. Peer talk can help, as can metacognitive activities and/or homework. Learners improving more often when discussing the reason for the change, what remains the same and the impact of the language on tone. Students should use these tools as a live tutor to a writing event and not as a set of "auto correct" buttons. Even then they are to continue to communicate with their teachers, as the class can then provide feedback on the ideas, clarity and audience engagement as well as grammar.

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Limitations of the Study

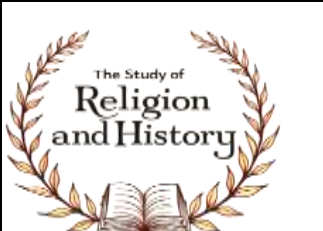
Although the findings of the study on effect of AI writing tools on ESL learners in Rahim Yar Khan provides some noteworthy insights, the present findings need to be viewed with certain constraints in mind that limit their applicability in wider contexts. Firstly, the results of the entire study are limited to one district, and hence, may not be representative of other districts of Pakistan or even other countries around the world. Additionally, the participant sample was not large, even though it was stratified (100 students); it may not reflect the diversity of ESL learners. There is also the intervention itself: it only lasted for three months and seemed a bit brief to expect more lasting or enduring gains in writing. Moreover, only two AI tools were analyzed, as other tools, such as ChatGPT, were not included, so the picture is only partial. So future, longer-term research work would be very useful.

Future Research Directions

Future studies should extend the present demographic and geographical perspective and examine in detail the ESL learners from a wide range of urban and rural areas of Pakistan to make the results more generalizable. They would want to recruit a diverse sample, not just in academic disciplines, but socioeconomic status as well, so they can separate out how AI tools might impact various linguistic groups. It would also be helpful if the tests ran for a longer period, perhaps a year or six months, to determine if any long-term effects exist on grammar, vocabulary, and even academic results from AI writing tools. This may help in implementing better ESL teaching methods in the classroom.

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