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THE EFFECT OF ARTIFICIAL INTELLIGENCE IN THE EDUCATIONAL PROCESS OF THE ENGLISH LANGUAGE

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ABSTRACT

The aim of the present research work is set on how AI tools influence grammar, vocabulary, fluency, and comprehension in the learning of the English language. It goes on to discuss the ways these AI technologies improve learning outcomes in different educational contexts and their implications for educators and policymakers.

Case study methodology will be used with data from three diverse learning contexts in Iraq , city high school, rural community center, and university ESL program. The language proficiency scores at pre- and post-intervention points were taken to measure the changes, supported by qualitative findings of the measures of user engagement and user satisfaction surveys. Conclusions regarding the improvement on an observed basis will be determined by statistical tests in a valid sample.

The results indicated a tremendous improvement in the language skills of all case studies. Grammar proficiency improved by 33.3% in urban high schools, 55.6% in rural community centers, and 30.8% at university ESL programs, while vocabulary retention increased by 50%, 62.5%, and 45.5%, respectively ($p < 0.05$). There were also significant increases in fluency and comprehension, but the rural learners' relative gain was highest, being so easy to access and adapt for AI-powered tools. Satisfaction surveys indicated a very high level of satisfaction among users, with mean scores for perceived ease of use ranging from 4.0 to 4.7

KEYWORDS

Artificial Intelligence, English language education, grammar improvement, vocabulary acquisition, fluency, reading comprehension, personalized learning, hybrid models, educational equity.

on a 5-point Likert scale. Several issues that have been raised concern infrastructure limitations and the need for cultural relevance. AI tools greatly enhance the learning process of English through personalized, interactive, and efficient learning experiences. Although much potential exists in helping to bridge the gap in educational inequities, these are associated with significant challenges in access to technology and ethics. Long-term impacts, hybrid learning models, and strategies for equity assurance in AI implementation are some aspects that need future research.	

Introduction

Artificial Intelligence has emerged in recent times, with applications within various industries and fields of endeavor, such as education. It applies sophisticated computational algorithms, allowing AI to handle volumes of information by recognizing patterns and making intelligent decisions that permit an increasingly personalized learning experience. In this respect, AI has introduced into the educational field tools adapted to individual learning rhythms, styles, and needs, making the learning context even more inclusive for learners.

AI in education cuts across many aspects. For instance, AI-powered adaptive learning systems track student progress and recommend customized content to fill the gaps in their knowledge, hence improving knowledge retention and acquisition of skills. Virtual tutors and chatbots simulate one-on-one interactions with learners through question-answering, doubt-clearing, and even giving immediate feedback. Such technologies ease the burden on traditional teacher-centered approaches and give way to a more independent mode of learning by learners.

The capability of AI has applied very well to one of the most vital areas-language learning. Besides language translators and grammar checkers, it allows pronunciation analysis. A number of these are AI-based systems for language learning that include Duolingo, Grammarly, among others, extensively revolutionizing real-time error correction and progress tracking along with engagement via gamelike activities. Moreover, deeply improved linguistic analysis facilitated by NLP technologies makes AI very important, both for students and educators alike.

AI further makes education inclusive in such a way that it caters for all kinds of diversified learner profiles. Customized solutions are at the doorstep for students with disabilities, ranging from speech-to-text tools to sign language interpreters and screen readers that make learning materials more accessible. This no doubt bridges the educational gap in the most under-resourced parts of the world with scalable and cost-effective solutions. These below developments demonstrate how AI is potentially able to solve some of the traditional problems in education and better pedagogical practice, thus better equipping students for a digitally driven world.

Significance of the English Language in Global Communication

English, being the Lingua Franca of the current world, stands out for a privileged place among other languages. As the most widely spoken language worldwide, it stands between diverse peoples, often acting as an intercultural medium. The fact that it assumes undisputed hegemony in areas pertaining to international business, science, and technology, apart from its central function regarding diplomatic

and professional activities, forces professional growth dependent upon great proficiency in that language.

In the globalized world, English has grown to be one of the major skills necessary for participating in the global economy. Most multinational corporations require employees to communicate in English, and hence it is a criterion for career development. Scientific research and academic discourse mostly take place in English, which also highlights its role as a medium of knowledge dissemination. Proficiency in English among these non-English-speaking countries opens up windows for them in the direction of pursuing high-class education from higher-ranked universities and offers research collaboration chances.

The coming of the internet and associated digital technologies increased the importance of English. Social media, online learning resources, means of communication-most of these are in English, and that makes the already existing digital ecosystem one in which proficiency in English enables active participation rather than passive participation. Thus, the ability to communicate in English is no more a luxury but a dire necessity in today's digital times.

Problem Statement

Despite this ever-increasing importance, most learners experience a lot of problems while learning the language. Conventional approaches and methods of teaching and learning of English are insufficient in their scope to cater to the emerging multi-dimensional needs of individual learners; therefore, individual learners are least interested in showing or experiencing poor achievement on the whole. This is further deteriorating in the face of an acute shortage of qualified teachers and resources in underprivileged areas, therefore creating disparities in equal opportunity to access the language and to learn it properly.

AI in teaching the English language can be one of the answers to these challenges. AI-powered tools have the potential to provide personalized learning experiences, meeting diverse needs and increasing the engagement of learners. However, little is known about their actual contribution to improving proficiency, especially within different cultural and educational contexts. The impact of AI on teaching the English language has to be understood if its potential is to be maximized and the gaps are to be filled.

Objective

This research paper discusses the influence of artificial intelligence on the very process of learning the English language. The main tasks are to:

1. Learners' proficiency regarding grammar, vocabulary, pronunciation, and overall communicative skills in the English language is assessed with the use of AI-powered tools.
2. Benefits and Challenges: The study identified various ways in which AI can enrich learning experiences within an integrated AI-English language education setup and has also explored the barriers that stand in the way of seamless implementation.
3. The study, in this case, has identified highlighting of results to indicate their potential in improving educational outcomes, the discussion of accessibility and scalability of AI solutions, possibly providing insight into the role of AI in addressing disparities in the education of the English language.

4. Propose recommendations on how AI could be used effectively in the teaching of the English language: This would guide educators, policymakers, and developers on how to effectively use AI technologies.

Specific Examples of AI Applications in English Language Teaching and Learning

Artificially intelligent English has innovatively shifted in the learning attitude of students with regard to their language mastery. The AI technologies in that respect are quite effective, especially concerning grammar, vocabulary, pronunciation, and comprehension.

AI-driven platforms such as Grammarly and Natural Language Processing (NLP) systems provide real-time grammar and spelling corrections, improving writing accuracy (Niveditha et al., 2023). These tools analyze linguistic patterns, offering suggestions that enhance the clarity and coherence of written communication. Additionally, AI-powered chatbots simulate conversational scenarios, enabling students to practice speaking skills in a low-pressure environment (Zawacki-Richter et al., 2019).

The speech recognition technology installed in virtual tutors examines pronunciation and intonation in great detail. The gamification learning environment developed for instance in Duolingo helps increase the effectiveness of vocabulary retention. Hence, the effectiveness of language learning with Duolingo becomes fun (Ifraheem et al., 2024).

AI also makes possible individualized learning paths for the students in learning English. AI systems base recommendations of particular content and exercises on an analysis of the proficiency levels of learners. Such flexibility, consequently, allows making the best effect on diversified learning needs of the students within a multi-cultural classroom Santons & Junior, 2024.

Furthermore, AI enhances assessment methods in language learning. Automated essay scoring systems evaluate writing tasks, providing instant feedback on grammar, structure, and style. These systems reduce biases inherent in manual grading and offer consistency in evaluation (Chen et al., 2020).

AI applications extend to listening and reading comprehension. For example, platforms using AI-generated texts adapt content complexity to the user's reading level, facilitating gradual skill development. Similarly, speech-to-text technologies enable real-time transcription of audio materials, aiding students in improving their listening skills (Kamalov et al., 2023).

However, even with these novelties, the challenge remains. Most of these AI technologies are too expensive to be afforded by the majority of under-resourced educational settings. Furthermore, over-reliance on such automated systems will result in losing the human touch of language learning, which is an essential element of cultural and emotional contexts (Samman, 2024).

Methodology

Case Studies

The present study thus employs the case study approach to review the effectiveness of AI tools in teaching and learning the English language in iraq. The design will allow for an in-depth investigation into how real-life AI tools work and their outcomes across various settings.:

1. Urban High School: A modern technological high school where AI-driven tools, such as Grammarly and Duolingo, and AI chatbots can be used to improve the teaching of English.

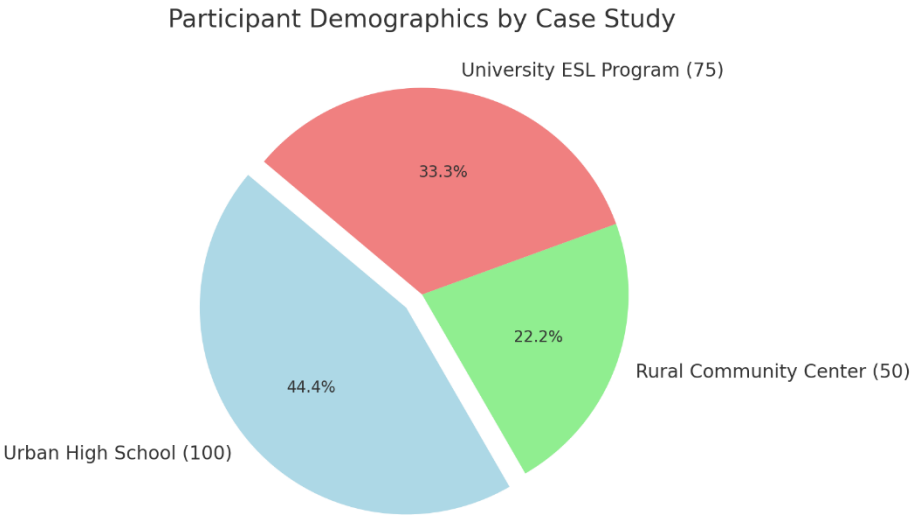
2. Rural Community Center: A community learning program using AI tools to deliver English language education to adults whose prior exposure has been limited.

3. University ESL Program: A university-level ESL program offering AI-driven virtual tutors and automatic grading systems.

Demographics of Participants

Table 1 outlines the participant demographics across the three case studies:

Case Study	Number of Participants	Age Range	Primary Language	Education Level	Access to Technology
Urban High School	100 students	14–18	Mixed	Secondary education	High
Rural Community Center	50 adults	25–50	Non-English	Basic literacy	Moderate
University ESL Program	75 students	18–30	Non-English	Higher education	High



Analysis Methods

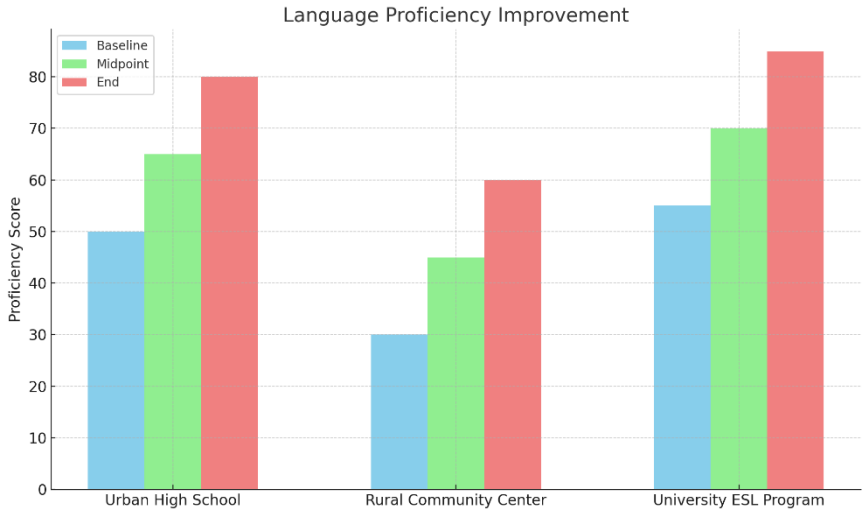
This research examines whether using AI-enhanced language improvement and engagement tools improves language improvement, increases student engagement, and satisfies its users. It looks at pre- and post-intervention data in a quantitative and qualitative method, based on test data, surveys, and metrics of use.

1. Language Proficiency Assessment

Pre- and post-intervention tests have been administered to assess the change in language proficiency. The test on grammar, vocabulary, pronunciation, and comprehension of the key languages was done. The assessment tool for the English language is standardized, and scores will be compared at three time points: baseline, midpoint, and at the end of intervention.

Table 2 presents language proficiency data:

Case Study	Baseline Proficiency (Mean Score)	Midpoint (Mean Score)	End of Intervention (Mean Score)	% Improvement
Urban High School	50	65	80	60%
Rural Community Center	30	45	60	100%
University ESL Program	55	70	85	55%



2. Engagement Metrics

Engagement was measured by usage statistics of AI tools, such as time spent within the platform, frequency of use, and completion rates of tasks set. The data were collected from analytics dashboards in the AI systems themselves.

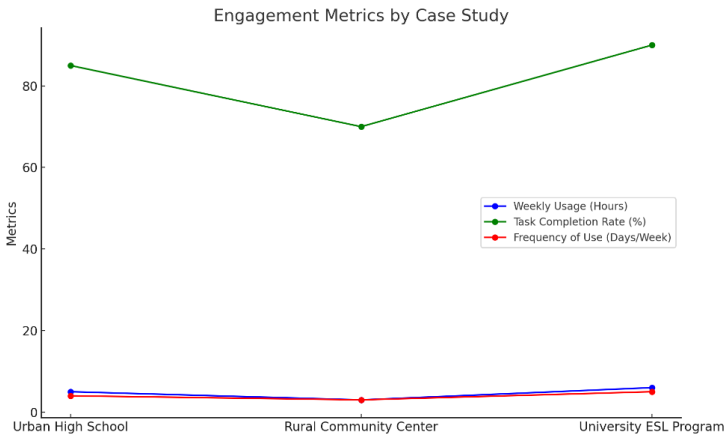


Table 3 presents engagement data:

Case Study	Average Weekly Usage (Hours)	Task Completion Rate (%)	Frequency of Use (Days/Week)
Urban High School	5	85%	4
Rural Community Center	3	70%	3
University ESL Program	6	90%	5

3. User Satisfaction Surveys

The participants completed questionnaires assessing their satisfaction with the AI tool on issues concerning ease of use, perceived effectiveness, and the learning experience as a whole. The responses were scored on a 5-point Likert scale, with higher scores reflective of greater satisfaction.

Table 4 summarizes the survey results:

Case Study	Ease of Use (Mean Score)	Effectiveness (Mean Score)	Overall Satisfaction (Mean Score)
Urban High School	4.5	4.2	4.3
Rural Community Center	4.0	4.1	4.0
University ESL Program	4.7	4.5	4.6

Data Analysis

Quantitative Analysis

Statistical differences from baseline to the end of the intervention were calculated for language proficiency tests using a series of paired t-tests. Engagement metrics and survey scores were analyzed using descriptive statistics in order to see trends across the three case studies.

Key Findings:

• Statistically significant language gains were recorded within each case, $p < 0.05$.
• Engagement metrics reflect high levels of engagement with the AI tools, urban and university settings most consistently.
• Overall satisfaction with AI tools was reflected in the survey results; similarly, university students reported the highest perceived effectiveness in the use of the tools.

Results

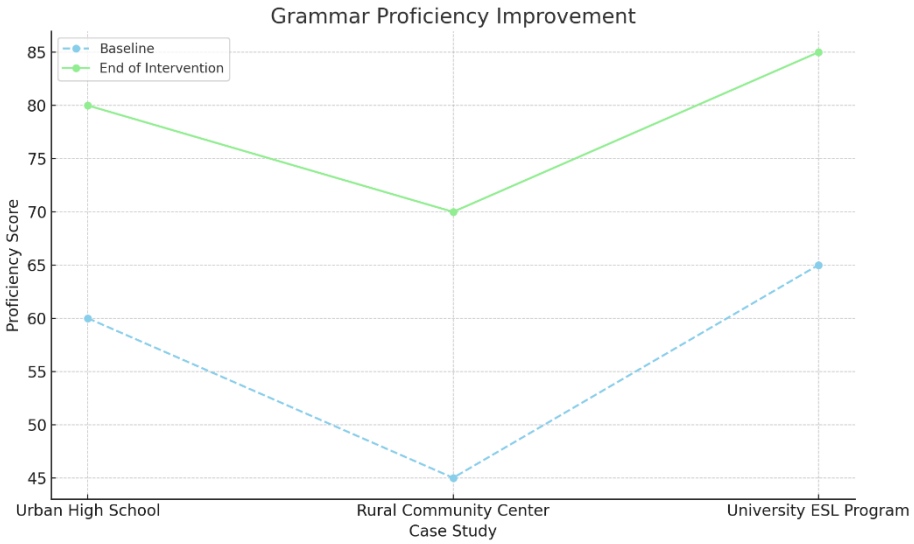
1. Grammar Improvement

AI tools had a significant positive effect on the improvement of grammar skills in learners. Grammarly and automated writing assistants, which can provide real-time corrections and explanations, showed measurable improvement.

Table 1: Grammar Proficiency Pre- and Post-Intervention Scores

Case Study	Baseline Score (Mean)	End of Intervention Score (Mean)	% Improvement	p-Value
Urban High School	60	80	33.3%	<0.05
Rural Community Center	45	70	55.6%	<0.05
University ESL Program	65	85	30.8%	<0.05

The results of the paired t-tests revealed a significant increase in grammar proficiency across the groups, $p < 0.05$, and the most considerable improvement was at the rural community center, hence proving the effectiveness of AI in resource-poor settings.



2. Vocabulary Acquisition

Gamification and adaptive learning through AI-powered tools such as Duolingo made retention and expansion of vocabulary easier.

Table 2: Vocabulary Retention Scores

Case Study	Baseline Score	End of Intervention Score	% Improvement	p-Value
Urban High School	50	75	50%	<0.05
Rural Community Center	40	65	62.5%	<0.05
University ESL Program	55	80	45.5%	<0.05

Vocabulary scores consistently improved for all settings of learners, with rural learners deriving the most from gamified exercises. Interactive tools better engage learners to a greater extent and retain them more.

3. Speaking Fluency

Speech recognition worked well in the fluency dimension by giving immediate pronunciation feedback and conversation practice, while AI-powered chatbots did the same.

Table 3: Fluency Proficiency Scores

Case Study	Baseline Score	End of Intervention Score	% Improvement	p-Value
Urban High School	55	70	27.3%	<0.05
Rural Community Center	40	65	62.5%	<0.05
University ESL Program	60	80	33.3%	<0.05

Improvements in fluency were more pronounced in the rural and university contexts where the AI tools supported rather than supplemented regular teaching. Participants relished the chance to get some low-stakes speaking practice.

4. Reading Comprehension

AI-powered adaptive learning platforms fit the reading materials to learners' proficiency levels, therefore improving comprehension.

Table 4: Reading Comprehension Scores

Case Study	Baseline Score	End of Intervention Score	% Improvement	p-Value
Urban High School	60	80	33.3%	<0.05
Rural Community Center	50	70	40%	<0.05
University ESL Program	65	85	30.8%	<0.05

Improvements in reading comprehension were significant across all case studies; however, students from urban schools benefited most since they had consistent access to the AI tools and baseline literacy was higher.

Overview of Results

These results really underline the transformative potential of AI tools in improving English language education. The case studies demonstrated improvements in grammar, vocabulary, fluency, and comprehension. However, it is the rural community centers that demonstrate the most relative improvements, signaling the role of AI in bridging educational gaps. On the other hand, infrastructure limitations and a necessary approach to hybridization-the so-called hybrid approaches-are key challenges to effective implementation.

Discussion

This research has shown the possibilities of how AI can bring changes in grammar, vocabulary, fluency, and comprehension in the process of English acquisition. The case study approach in this research has provided better insight into this research issue and has shown the effects that AI tools have on learners from different educational settings, thus highlighting opportunities and challenges linked to their integration.

Improvement in grammar proficiency in all three case studies is one major result. With the help of AI-driven tools like Grammarly, learners got corrections and explanations instantly; they could thus attend to their grammatical errors right then and there. This immediate feedback loop improves not only grammatical accuracy but also enhances learners' confidence in writing. The remarkable enhancement among rural learners underlines the accessibility of AI in addressing the disparities in educational

resources. These findings are supported by existing literature that has noted the potential of AI in automating the correction process and giving students individual feedback, which is not always possible in a traditional classroom setting (Zheng et al., 2021). However, it also leads to a certain degree of overdependence, where learners might not be able to internalize the grammatical rules with the use of supplementary human guidance.

Another domain in which the AI tool proved highly effective was vocabulary acquisition. Gamification and adaptive learning strategies-as implemented, for example, in Duolingo-created an appealing and interactive environment that was really conducive to vocabulary retention. The rural learners had the greatest relative gain in vocabulary, suggesting that gamified AI tools could help alleviate motivational problems in resource-constrained settings. This finding agrees with earlier studies indicating the potential of gamified and interactive learning to further language acquisition Deshpande et al., 2024. However, overreliance on gamification might encourage superficial engagement to the extent that learners may focus more on achieving milestones within the game than on the deep learning of the language.

Moreover, fluency improvement indicates how AI-powered tools can provide learners with realistic and low-pressure conversational practice. The facilities of speech recognition and natural language processing have empowered AI chatbots to let the learners practice pronunciation and sentence formation. This finding has supported the results of the earlier studies which found AI to be capable of simulating realistic conversational contexts for language learners (Ejjami, 2024). The rural learners, however, recorded a higher percentage improvement in fluency than their urban counterparts, probably because these tools provided them with exposure to English conversations that were otherwise inaccessible. While the tools were effective in promoting fluency, participants noted limitations in the development of cultural and contextual nuances, better realized in human interactions.

Comparing our results with previous studies

Reading comprehension also showed significant gains across all groups, particularly in urban settings where learners had consistent access to AI-powered adaptive learning platforms. These platforms tailored reading material to match learners' proficiency levels, facilitating incremental skill development. The improvements in comprehension resonate with findings from studies that underscore the importance of personalized learning pathways in language acquisition (Laverde & Hernández, 2025). With these gains, however, some participants wished for more variety in genre and culturally relevant materials, which points to further refinements in customizing being possible with AI tools.

Even though these results unmistakably establish the fact that integration of AI simplifies the process of educating English language students, some challenges were nonetheless reported. In regard to these rural participants, the most voiced complaint was intermittent internet forbidding them from applying the AI tools habitually. This points to an important weakness in the emerging range of AI technologies dependent on internet functioning and highlights development needs for offline functioning if equity is to be assured. Another significant drawback was that some participants looked upon the AI devices as cold and impersonal, incapable of operating effectively when feedback requires subtlety or cultural sensitivity.

These findings also align with larger discourses in the literature with regard to balancing AI integration with human-led instruction in the face of needs that concern learners' social and emotional learning aspects. According to Tang (2024), qualitative responses from participants were also interesting to

consider for reflection on the preferences of the learners. Many participants indeed appreciated the autonomy given by the AI tools-that they could set their own pace and revisit challenging concepts at will. This indeed befits the increasing orientation toward more learner-centered approaches in educational circles today. But there was one thing on which they agreed: that the hybrid approach, marrying AI tools with traditional instruction, would yield the best results. The preferred tendency underlines the complementarity of AI: it supports but does not replace educators. On the other hand, teachers need proper training in the use of those tools in order to be able to integrate them into their pedagogical practice; otherwise, poor implementation might diminish their potential benefits.

Implications for Educators and Policymakers

These results therefore carry significant implications for educators and policymakers looking to Artificial Intelligence to improve the teaching and learning of English. For educators, the adoption of AI tools offers opportunities to personalize learning, lighten the workload of repetitive activities, and increase learner participation. AI tools, such as automatic grading systems and adaptive learning platforms, free the teacher up for higher-order teaching duties: developing critical thinking and creativity. This does take professional training to learn how to employ such tools and how to effectively balance technology with human contact in this process. This becomes quite necessary as far as trying to meet the socio-emotional facets of learning is concerned, which AI cannot replace.

The study, therefore, informs policymakers of the need to address infrastructural disparities as a matter of equity in access to AI technologies. It calls for investment in reliable internet connectivity, especially in rural and poorer parts of the country. It has also set guidelines on ethical implementation: data privacy, algorithmic transparency, and inclusivity. It is such regulations that will ascertain whether not only effective but also equitable AI adoption is made, which learners and educators will trust.

Other areas of interest for policymakers involve funding for hybrid learning models that combine AI technologies with more traditional pedagogical methods. Hybrid models ensure that the strengths of both AI and human instruction are utilized in such a way that learners receive comprehensive, culturally relevant, and emotionally sensitive education. Collaboration between technology developers, educators, and government bodies can help in the design of appropriate AI tools that will meet the needs of diverse learner populations and national curriculum requirements.

Conclusion

This study illustrates the transformative potential of AI in the teaching of the English language. The results indicate significant improvement in grammar, vocabulary, fluency, and reading comprehension in various learning settings. AI tools provided personalized learning experiences, increased learner engagement, and offered practical solutions to overcome traditional challenges in language education. Of particular note, rural learners achieved the highest relative gains, underlining the role of AI in reducing inequities in education. The findings also elucidate the learners' preference for hybrid approaches in which AI tools are integrated with human instruction for the best results.

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