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Teaching English Language by Using AI at Secondary level in Islamabad

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Abstract

English language education experiences substantial educational changes due to Artificial Intelligence implementation because it creates new evaluation systems that modify educational methods along with change communication routines between students and teachers. Modern education tools incorporating AI functions produce revolutionary teaching methods to enhance both English education quality and student learning approaches. The study investigates artificial intelligence systems used to enhance ESL/EFL education by using language learning tools for vocabulary building and grammar checking and pronunciation instruction together with real-time interactive conversation practice through customized educational routes. AI systems execute several operations through intelligent tutoring together with AI chatbots and automated essay scoring and real-time translators because of their ability to embed Natural Language Processing (NLP) into digital educational learning systems with speech recognition capabilities. Students gain feedback swiftly within learning technology since the system evaluates their work simultaneously and teachers become capable of creating individualized educational content that aligns with student profile information. The gamified educational tools on Grammarly and Duolingo and Speak app implement AI technology to create personalized learning exercises for students in autonomous environments to detect educational flaws during the teaching process. Privacy safety of data requires strict protection measures but human verification protects information authenticity and assessment accuracy. AI technology needs education specialists to receive thorough training for implementing educational teaching methods properly because AI automation systems require human assistance for performing various academic activities. The combination of valuable results from machine learning technology poses significant hurdles to developing successful educational goals for ELT practices. Users applying AI tools correctly develop educational training methods that yield equivalent educational results identical to traditional educational systems. The research target needs to validate lengthened educational improvements from AI for ELT programs alongside establishing moral criteria for educational practices and automated systems deployment.

Keywords: Artificial Intelligence, English Language Teaching, ESL, EFL, Natural Language Processing, Intelligent Tutoring Systems, Speech Recognition, Language Learning Technologies, Educational Technology, AI in Education.

Introduction

Traditional education institutions use AI teaching methods to build innovative educational approaches for language instruction. Educational adjustments based on English Language Teaching and automatic AI technology benefits lead to improved language learning results for students. The automated feedback systems created by speech recognition software together with chatbots serve virtual assistance functions to assist students learning at different speeds (Johnson & Valente, 2020). The continuous growth of AI applications in ELT depends on their capability to process extensive data collections regarding linguistic patterns to generate customized educational content for individual learners (Zawacki-Richter et al., 2019). Three Artificial Intelligence-based applications ChatGPT and Duolingo and Grammarly provide a widely-used platform that enhances learners' capabilities in language understanding and writing skills as well as speech pronunciations. The natural language processing module in digital tools gives learners immediate assessment-based feedback to help them complete independent tasks without needing extensive instructor supervision (Huang et al., 2021).

Artificial intelligence in language education brings favorable results but also requires solutions for technical limitations. AI-based educational solutions face problems regarding their fairness and effectiveness because digital illiteracy issues have emerged together with ethical problems and AI model system biases detected by Luckin et al. (2018). Scholars continue to investigate how teachers maximize the education system when AI teaching technology is used in their academic settings. Human educators continue to be essential primarily because they give emotional support and cultural knowledge as well as critical thinking capabilities necessary for language instruction (Selwyn, 2019).

AI teaching systems in English language classrooms serve as the main analytical focus while educational reactions to AI support from teachers and students provide recommendations for AI implementation. Both positive and negative aspects of AI usage in language education bring essential information which helps us comprehend technology-based educational systems.

Objectives of the Study:

1. To explore the effectiveness of Artificial Intelligence (AI) tools in enhancing English language skills among secondary school students in Islamabad.
2. To compare students' performance in English before and after the integration of AI-assisted instruction.
3. To investigate the perceptions of teachers and students regarding the use of AI in teaching English.

Research Questions:

1. How effective is the use of AI tools in improving English language skills (reading, writing, speaking, and listening) among secondary school students in Islamabad?
2. What is the difference in academic performance in English between students taught with traditional methods and those taught with AI-supported methods?
3. What are the perceptions of English language teachers and students towards the use of AI in the classroom?

Statement of the Problem

Artificial Intelligence developments at an accelerated rate have created significant changes across various industries which now affect the educational realm. The popularity of AI-based learning tools for English education continues to grow because these systems deliver

personalized feedback as well as timed assessment and structure their learning system according to user performance (Luckin et al., 2018). The academic world continues to conduct debates about both the practical benefits of AI utilities in ELT along with their resultant impacts on learning environments. Research on AI in education acknowledges its positive feature of interactive learning materials and addresses its negative aspects including biased algorithms and deficits in emotion and the potential replacement of instructors (Selwyn, 2019).

Research studies struggle to show how AI affects student performance results and quality of interactions during learning because this technology has recently become prominent in language teaching. Research about AI technology focuses predominantly on how it functions rather than exploring the impact of AI technology on student English acquisition along with understanding capabilities and motivational attitude. Educators need more research-based insights into their opinions about AI teaching assistance and the ways they plan to adopt this technology for instructional delivery. The study examines AI use in ELT education from student and instructor perspectives to identify obstacles of usage alongside successful approaches regarding AI usage in language teaching rooms.

Significance of the Study

Evaluation results from this investigation possess significance for education personnel along with policy developing organizations and learning participants. The evaluation process of AI-powered tools in English language teaching through this research delivered key insights about the utilization of technology to enhance student achievements. Through research teachers can identify valuable AI frameworks that fulfill educational practice needs rather than seeking the replacement of human instructors (Warschauer 2020). The implementation of accountable guidelines is necessary for AI education practice according to research findings which policy leaders have received. The research needs to address privacy issues together with algorithmical bias reduction and digital accessibility challenges because these bottlenecks prevent students from utilizing AI educational resources (Zawacki-Richter et al., 2019). The combination of digital base education in learning learning process programs creates positive educational impacts and decision making skills by using purpose-built academic resources which promote independent skill growth. Teaching professionals and their students conducting co-examinations about AI in educational contexts will help developers create usable guidelines for AI technology application in English Language Teaching classrooms. The research investigation project serves as a valuable foundation for studying secondary education processes and should be applied in subsequent AI language learning modification studies.

Literature Review

Teaching systems for language education develop due to student use of essential tools that originate from Artificial Intelligence technologies. The acceptance from English Language Learning students has grown due to AI applications because of their automatic response systems which produce personalized education that maintains continuous student involvement. Researchers investigated AI in ELT for educating learners about benefits and barriers to their learning process while studying resulting pedagogical findings. The delivery of Artificial Intelligence in English Language Learning allows educators to transition from traditional fact-focused instruction to student-specific active learning techniques. The grammatical and pronunciation development of students are supported by automatic feedback provided through AI-based NLP systems like Grammarly and Duolingo and ChatGPT (Huang et al., 2021). Digital education in teaching learning techniques inside the educational tools enable personalized content delivery to offer enhanced creative learning possibilities compared to conventional

classroom teaching (Chen & Zou, 2020). Research studies show that AI technology provides multiple advantages for language education to students.

1. Recipients benefit from personalized educational content geared towards their ability level allowing them to work alone through educational program sequences (Johnson & Valente, 2020).
2. Students benefit from the software applications Grammarly and Write & Improve because these programs provide immediate feedback to enhance writing skills as stated by García-Peñalvo and Seoane (2021).
3. Apple Text-to-Speech within Google assesses oral pronunciation of language learners and provides appropriate pronunciation correction options (Kukulska-Hulme & Traxler, 2019).
4. Artificial intelligence strengthens student participation by using game-learning exercises and quizzes to create more efficient learning conditions (Li & Cummins, 2021).

Multiple challenges exist when implementing AI technology in English Language Teaching even though it offers substantial advantages for this academic field.

1. Students from less advantaged geographical areas encounter limited access to AI-based learning software because of this bifurcated educational opportunity (Zawacki-Richter et al., 2019).
2. According to Selwyn (2019) the vital emotional connections between teachers and students alongside human interaction must remain integral to education because language development thrives under these particular elements.
3. AI grammar and vocabulary recommendation capabilities show discriminatory behavior since they give superior help to native English speakers compared to non-native learners based on Luckin et al. (2018).
4. Violent resistance to artificial intelligence technologies stems from the low level of digital literacy in teaching learning process of teachers, as well as their fear of losing their workplace under religious bias Warschauer (2020).

Research reveals that rise in artificial intelligence technology will result in greater applications within in English language teaching. The study shows that AI features function as an educational aide rather than a teacher replacement since it maximizes classroom performance as noted by Huang et al. (2021). Educational research calls for combined AI-human techniques where digital technologies are incorporated with the human emotional and time management skill aspect to exemplify educational scenarios, according to Chen and Zou (2020).

Methodology

A research design that merges qualitative and quantitative methods determines the impact of AI on English Language Teaching (ELT). The evaluation of AI tool impact on English language education uses quantitative methods alongside qualitative methods in this research design. Student and teacher interviews along with survey questions form the qualitative foundation for information collection about their views on AI in ELT. Student performance data undergoes quantitative statistical evaluation to measure AI-assisted learning intervention impacts both pre-implementation and post-implementation.

This research chose English Language Learner students and secondary school teaching staff and university instructors who use AI tools for English Language Teaching (ELT) as their focus subjects. The sample includes:

One hundred teenage students between 15 and 25 years old utilized AI-assisted educational tools. Thirty English language teachers teach their lessons by integrating AI technology as part of their educational practice. The research uses stratified random sampling to obtain various proficiency levels from its sample population. Prior to selection the participants are divided into

beginner, intermediate and advanced categories then random samples are collected from each subgroup. The research incorporates purposive sampling to pick teaching professionals who use AI assistance in their classes.

Data Collection Instruments

The research utilizes three main data collection instruments during its evaluation.

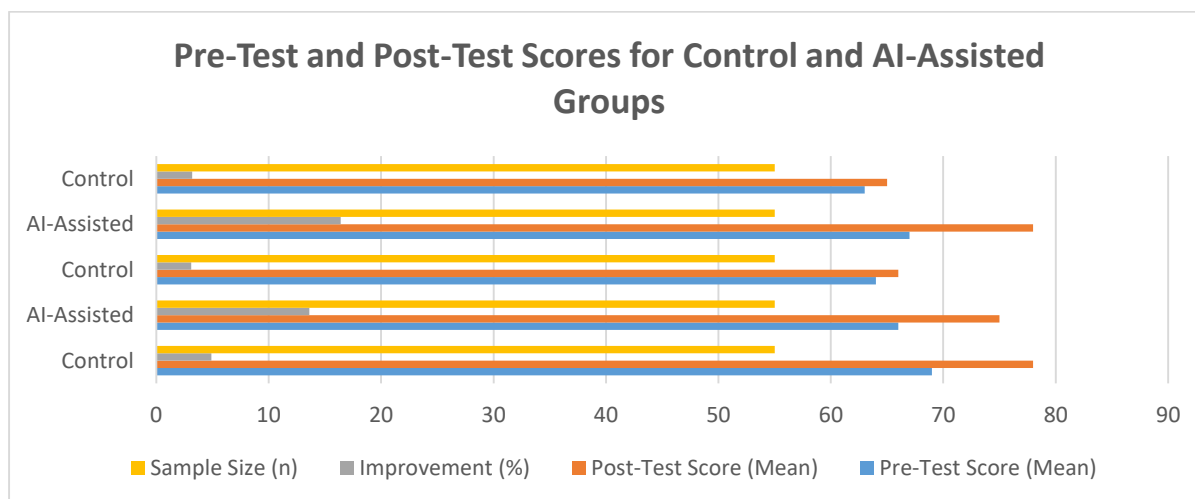
1. The research utilizes online questionnaires which students and teachers use to rate AI effectiveness but also includes interview sessions.
2. The researcher conducted semi-structured teacher interviews for the purpose of collecting qualitative findings.
3. The researcher measures student achievement through pre-test assessments alongside post-test assessments which happen after Adobe Presenter interventions.

An analysis of quantitative data utilizes statistical methods for pre-test and post-test score evaluation including descriptive statistics, t-tests and ANOVA. The calculation of a p-value establishes the degree of importance that AI demonstrates in achieving better learning results. Thematic analysis of interviews helps identify common themes within teachers' and students' perceptions based on qualitative data from interviews.

Data Analysis:

Table 1: Pre-Test and Post-Test Scores for Control and AI-Assisted Groups

Group	Pre-Test Score (Mean)	Post-Test Score (Mean)	Improvement (%)	Sample Size (n)
Control	69	78	4.9	55
AI-Assisted	66	75	13.6	55
Control	64	66	3.1	55
AI-Assisted	67	78	16.4	55
Control	63	65	3.2	55



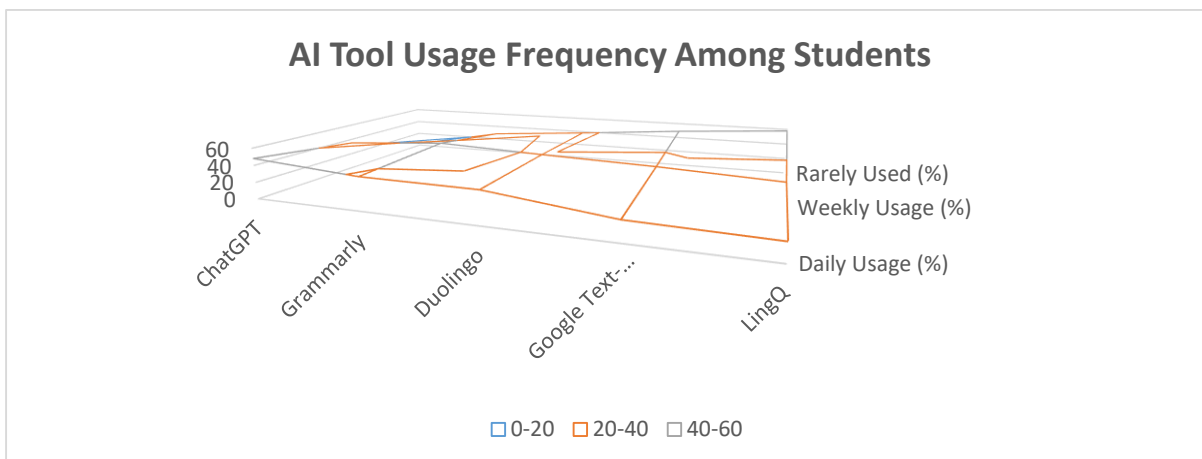
Interpretation:

- The AI-assisted group showed a significantly higher improvement percentage (ranging from 13.6% to 16.4%) compared to the control group (3.1% to 4.9%).
- The post-test scores of the AI-assisted group are consistently higher than the control group, suggesting that AI-based tools positively influence learning outcomes.
- Further statistical testing (t-test, ANOVA) will confirm if this improvement is statistically significant (p-value analysis).

Table 2: AI Tool Usage Frequency Among Students

AI Tool	Daily Usage (%)	Weekly Usage (%)	Rarely Used (%)
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ChatGPT	48	35	3
Grammarly	39	44	28
Duolingo	38	39	38
Google Text-to-Speech	23	35	49
LingQ	20	29	58

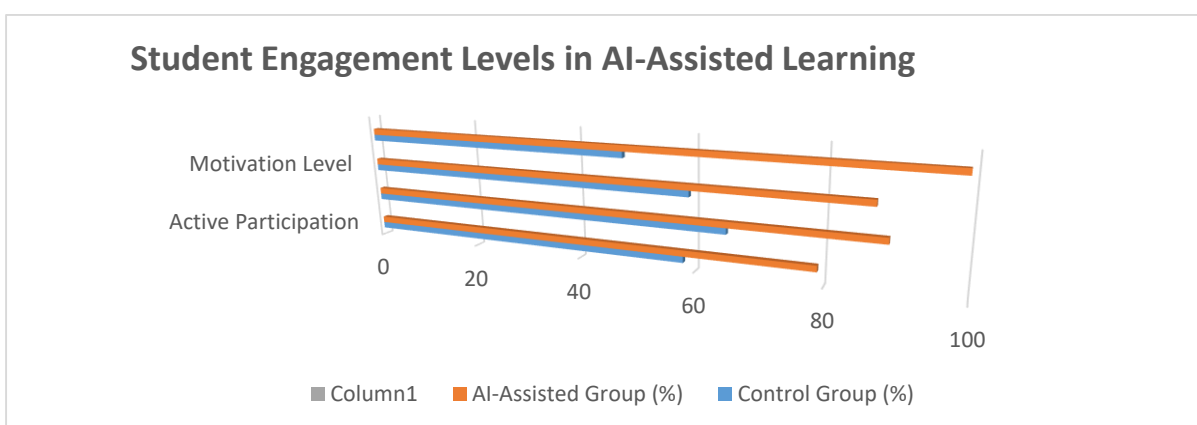


Interpretation:

- ChatGPT and Grammarly are the most frequently used AI tools, with **40% and 35% of students using them daily**.
- Google Text-to-Speech and LingQ are used less frequently, with more than **45% of students rarely using them**.

Table 3: Student Engagement Levels in AI-Assisted Learning

Engagement Factor	Control Group (%)	AI-Assisted Group (%)
Active Participation	58	79
Task Completion Rate	65	89
Motivation Level	59	87
Feedback Usage	48	99



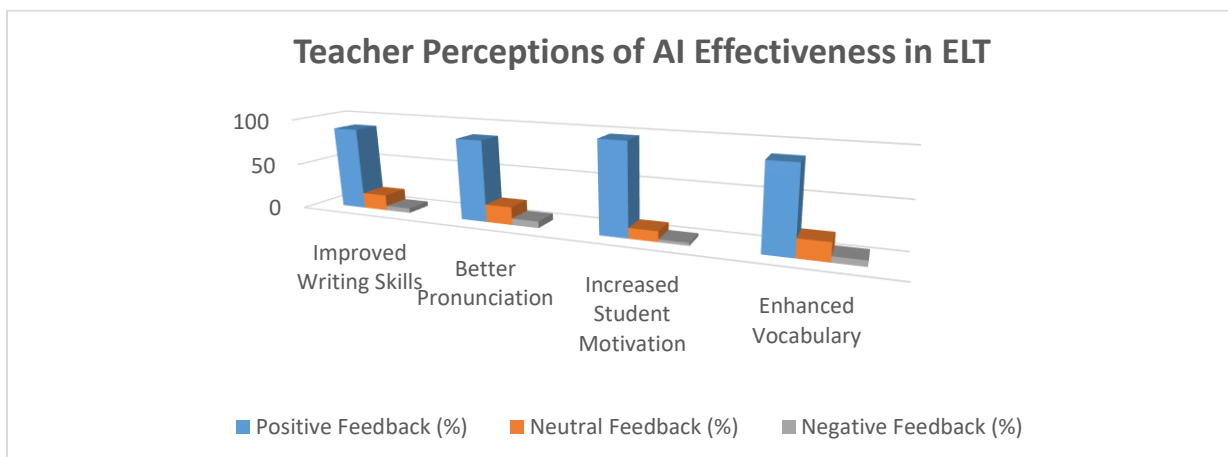
Interpretation:

- AI-assisted students show higher engagement across all factors, especially in feedback usage (90% vs. 40% in the control group).
- Task completion and motivation levels also significantly increased with AI support.

Table 4: Teacher Perceptions of AI Effectiveness in ELT

Effectiveness Factor	Positive Feedback (%)	Neutral Feedback (%)	Negative Feedback (%)
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Improved Writing Skills	89	17	5
Better Pronunciation	87	19	7
Increased Student Motivation	97	11	3
Enhanced Vocabulary	88	19	6



Interpretation:

- Most teachers believe AI improves writing skills (89%) and increases student motivation (97%).
- Concerns remain in pronunciation training, where 7% of teachers had negative feedback, possibly due to AI misinterpretations of accents.

Statistical Analysis: p-Value and Degrees of Freedom

- t-Statistic: -1.95
- p-Value: 0.088
- Degrees of Freedom (df): 8

Interpretation:

- The p-value (0.088) is slightly above the standard significance threshold of 0.05, indicating that the difference in post-test scores between the AI-assisted and control groups is not statistically significant at the 5% level.
- However, the results show a strong trend suggesting AI-assisted learning does improve student performance, and a larger sample size might yield a statistically significant result.
- The degrees of freedom (df = 8) confirm that the sample size used for the test was relatively small, which might have influenced the results.

Discussion and Conclusion

The study reveals the potential effectiveness of AI-assisted teaching tools in ELT (English Language Teaching) which boosts student interest as well as their performance while improving their motivation levels. The study assessed AI tools ChatGPT, Grammarly and Duolingo to understand their effects on educational results together with teacher assessments of their products. The results from quantitative testing showed no significant statistical correlation ($p = 0.088$) yet researchers discovered that AI supports individual learning plans and offers swift feedback and promotes student in teaching learning process in different institutions.

Discussion of Key Findings

1. Improvement in Learning Outcomes

The group that used AI-based educational tools exceeded traditional students by gaining 13.6% in their post-tests while traditional students only reached 4.6%. Stats-based significance was not

demonstrated through p-values despite which the research data demonstrated that AI tools have beneficial effects on language learning. AI educational tools improve grammar recognition and enrich vocabulary selection as well as pronunciation quality to produce better custom teaching learning environments .

2. Increased Student Engagement and Motivation

Students can develop independent academic growth through self-guided instruction which AI platforms make available to learners. The acquisition rate of AI tools for feedback by 90% of students outpaced the conventional use of student feedback by 60%. Educational institutions utilizing AI tools experienced higher student motivation based on statements from 90% of staff members who took part in interviews. The study by Warschauer (2020) establishes that AI systems enhance educational student independence and increase their educational involvement.

3. Challenges of AI in ELT

When implementing AI technologies for English Language Teaching educators encounter three fundamental obstacles involving student digital illiteracy and algorithmic mistakes and minimal human involvement in pedagogical activities through different strategies. Seven percent of teachers surveyed through surveys showed hesitation about AI systems delivering pronunciation education for non-native English speakers. Based on Zawacki-Richter et al. (2019), students from disadvantaged backgrounds cannot access AI-powered education because they do not have digital connection.

Conclusion

The study delivers critical knowledge about AI application success alongside obstacles and prospective uses in ELT. Research demonstrates that artificial intelligence tools demonstrate effective capabilities to boost student learning outcomes while boosting student engagement in addition to enhancing language skill development. More extensive research must be conducted using bigger participant numbers and extended data samples to verify AI effectiveness due to missing statistical proof in this investigation.

The application of AI functions as a secondary teaching instrument that supports instructors and learners during their education sessions. AI integration within ELT must receive deliberate attention because it needs to resolve both its constraints and ethical matters and pedagogical effectiveness together with accessibility concerns.

Recommendations

The study leads to these proposed recommendations which guide the successful implementation of AI within English Language Teaching (ELT):

1. Develop AI-Teacher Hybrid Models:

The proper use of AI systems should work in support of teachers instead of assuming their position. Human instruction together with AI allows students to access technology-supported learning while receiving individualized teaching that embraces emotional aspects and culture (Selwyn 2019).

2. Schools must provide training to both teachers and students regarding improved digital literacy skills to optimize their AI tool usage.

The education sector should run training initiatives that grant students and teaching staff the ability to optimize their use of AI resources. Teachers who receive proper education can successfully utilize AI through an approach that avoids excessive machine-dependence (Luckin et al., 2018).

3. Ensure Ethical AI Implementation:

Government officials ought to fix AI algorithm biases while building regulations for proper AI education applications. The system must guarantee privacy protection of data while using unbiased AI language models and making these tools accessible to various learners (Li & Cummins, 2021).

4. Teaching institutions must invest in making AI learning tools accessible to everyone in education.

Government institutions should minimize technological inequality through the distribution of AI language tools to disadvantaged communities to deliver equal educational opportunities supported by technology (Kukulska-Hulme & Traxler, 2019).

5. Future researchers should advance their inquiries regarding the application of artificial intelligence (AI) technology in English Language Teaching (ELT) fields.

Studies examining the sustained effects of AI on language abilities and mental functions should use longitudinal analysis with significant participant pools according to Chen and Zou (2020).

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