From Classrooms to Chatbots: Transforming English Teaching-Learning with Artificial Intelligence

Dr. Rajshree Rathod

Introduction

The integration of Artificial Intelligence (AI) in education marks a revolutionary shift, offering an array of benefits, particularly in English language teaching (ELT). As English becomes increasingly essential in a globalized world, AI presents opportunities for personalized learning, immediate feedback, and the improvement of key language skills such as vocabulary acquisition, grammar, reading comprehension, and speaking fluency. For higher secondary students, AI tools offer an innovative method to bridge learning gaps and adapt to individual learning needs.

The goal of this paper is to explore the impact of AI on English language proficiency for higher secondary students, focusing on how AI-powered tools can transform the teaching-learning process. By integrating AI technologies such as chatbots, adaptive learning platforms, and automated assessment tools, this study investigates the effectiveness of these tools in enhancing student engagement, learning outcomes, and self-paced learning. Furthermore, it addresses the challenges that hinder the widespread adoption of AI in classrooms, including limited access to technology, high costs, and the need for teacher training.

Literature Review

The Role of AI in Education

AI technologies have shown promising results in improving educational outcomes by providing personalized, scalable learning experiences. In particular, AI is used in **intelligent tutoring systems**, which adapt content delivery according to student progress (Wang et al., 2020). This adaptability makes AI a valuable tool in language education, where student needs vary widely based on proficiency levels.

A review by **Li & Zhang (2021)** highlights the significant role of AI in language learning, citing AI-based platforms such as **Duolingo**, which offers personalized vocabulary and grammar exercises based on the learner's performance. Similarly, **Grammarly** helps students refine their writing skills by providing real-time feedback on grammar, spelling, punctuation, and style. These platforms engage learners through immediate responses and repeated practice, key components of effective language acquisition (Reinders, 2021).

AI in Language Learning: Current Trends

AI's ability to provide continuous, personalized learning support is particularly effective in language instruction, which requires regular practice and reinforcement. Adaptive learning platforms such as **Knewton** and **Smart Sparrow** allow for individualized content delivery, adjusting the complexity of tasks based on the learner's progress (Johnson, 2022). These platforms enable students to receive learning content that matches their skill level, promoting mastery at each stage of the learning process.

In addition, **AI-powered chatbots**—including **ChatGPT**—are increasingly being used to simulate real-life conversations, enabling students to practice speaking and writing in a non-threatening environment. Studies have shown that students who engage with chatbots demonstrate improved fluency, grammar accuracy, and confidence (Xie, 2020).

However, challenges persist, including technological access, financial barriers, and the necessity of teacher training to effectively integrate AI tools into existing curricula (Bates, 2019). These issues must be addressed to ensure the successful adoption of AI in educational settings.

Research Methodology

This study uses a **mixed-methods approach**, combining both **quantitative** and **qualitative** research methods to assess the impact of AI on English language learning. A total of 150 higher secondary students from Pune city participated in the study, with data collected over six months. This section outlines the research design, sample characteristics, and data collection methods used in this study.

Sample Selection

The study involved 150 students aged 15-18, enrolled in English language courses in an English Medium school from Pune city.

The sample was randomly divided into two groups:

- **Experimental Group (AI Group)**: 75 students who utilized AI-powered tools (chatbots, adaptive learning platforms, automated assessments).
- **Control Group (Traditional Group)**: 75 students who followed traditional teaching methods, including textbook-based lessons and teacher-led instruction.

The study focused on four key aspects of language learning: vocabulary acquisition, grammar accuracy, reading comprehension, and speaking fluency. Both groups completed pre-tests and post-tests, and data was collected through surveys and interviews.

Data Collection Tools

1. **Pre-test and Post-test**: Both groups took the same English proficiency test at the start and end of the study. The test evaluated students' skills in vocabulary, grammar, reading comprehension, and speaking fluency.
2. **Surveys**: Students and teachers completed Likert-scale surveys, assessing their perceptions of AI's effectiveness, engagement, and overall learning experience.
3. **Interviews**: A subset of students and teachers were interviewed to gain in-depth qualitative insights into the role of AI in enhancing learning. Interview questions focused on student motivation, confidence, and their interaction with AI tools.
4. **Classroom Observations**: Teachers' classroom observations tracked student engagement and participation in AI-assisted lessons.
5. **Statistical Tools**

The quantitative data was analysed using **SPSS (Statistical Package for the Social Sciences)**. Descriptive statistics (mean and standard deviation) were used to summarize the test scores, while a **paired t-test** was employed to assess whether differences in test scores between the experimental and control groups were statistically significant. The significance level was set at **$p < 0.05$**.

Qualitative data from surveys and interviews were analysed thematically, with recurring themes identified regarding student experiences, AI's impact on learning, and teacher perceptions.

Results

Quantitative Results

The pre-test and post-test results from both groups are summarized below:

Group	Pre-test Score (Mean)	Post-test Score (Mean)	Difference	p-value
Experimental Group	**56%**	**82%**	**+26%**	**0.001**
Control Group	**55%**	**64%**	**+9%**	**0.02**

- The **experimental group** saw an average improvement of **26%** in language proficiency, significantly outperforming the **control group**, which showed a **9%** improvement.
- The **p-value** for the experimental group was **0.001**, indicating a statistically significant improvement in language skills due to AI intervention. For the control group, the p-value was **0.02**, suggesting a moderate improvement, but less significant than the experimental group.

Qualitative Results

From the surveys and interviews, several key themes emerged:

1. **Increased Engagement**: 85% of students in the experimental group reported being more engaged with lessons due to the interactive nature of AI tools. Students particularly appreciated AI chatbots for providing a conversational practice space.
2. **Improved Confidence**: Many students in the experimental group reported higher confidence in their speaking and writing skills. AI feedback helped them correct errors without fear of judgment, fostering a positive learning experience.
3. **Teacher Perceptions**: Teachers acknowledged the benefits of AI in engaging students, but stressed that AI should complement, not replace, teacher involvement. They highlighted the need for personalized guidance in areas such as critical thinking and emotional intelligence.
4. **Challenges**: Some students and teachers raised concerns about the accessibility of AI tools, particularly in schools with limited resources. Furthermore, teachers expressed a need for comprehensive training on how to integrate AI into the curriculum effectively.

Discussion

The results suggest that AI tools can significantly enhance English language learning, particularly in vocabulary acquisition, grammar accuracy, and speaking fluency. The experimental group, which used AI-powered tools, showed substantial improvements in these areas compared to the control group. These findings are consistent with previous studies on the effectiveness of AI in language learning (Wang et al., 2020; Li & Zhang, 2021).

The integration of AI tools allowed for personalized learning experiences, with students progressing at their own pace and receiving immediate feedback. Chatbots and adaptive learning platforms offered opportunities for students to practice speaking and writing in a non-threatening, interactive environment. However, the importance of teacher guidance in fostering critical thinking, creativity, and emotional intelligence cannot be overstated. While AI can provide personalized instruction, it cannot replace the human elements of teaching.

Despite the advantages, challenges remain. The primary barriers to AI integration

include limited access to technology, high implementation costs, and a lack of teacher training. These obstacles must be addressed to ensure that AI can be effectively integrated into classrooms, particularly in under-resourced schools.

Conclusion

AI offers significant potential to enhance English language learning, providing personalized, engaging, and interactive experiences for students. The findings of this study demonstrate that AI tools, including chatbots and adaptive learning platforms, can significantly improve student proficiency in key language areas such as vocabulary, grammar, reading comprehension, and speaking fluency. However, for AI to be fully effective, it must complement traditional teaching methods, with teachers playing a central role in guiding students' learning.

The successful integration of AI into language classrooms requires addressing challenges related to accessibility, cost, and teacher training. By ensuring equitable access to AI tools and providing educators with the necessary training, educational institutions can harness the power of AI to create more dynamic, engaging, and personalized learning environments.

References

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