MODERN METHODS OF TEACHING ENGLISH THROUGH ARTIFICIAL INTELLIGENCE TOOLS FOR COMPUTER ENGINEERING STUDENTS

Author: Mahbuba Yusupova Rustam qizi [1], Aydin Elmi [2], Muhammadamin Jo'raboyev Raxmonjon uǵli[3]
Affiliation: English Teacher, Department of Foreign Languages Nordic International University [1], Sophomore student at the Department of Computer Engineering (Multimedia Technologies),Nordic International University [2,3]
DOI: https://doi.org/10.5281/zenodo.19679507

ANNOTATION

This article explores modern methods of teaching English to Computer Engineering students through the use of artificial intelligence (AI) tools. The rapid development of digital technologies requires future engineers to possess not only technical skills but also strong English language competence. AI-based tools such as chatbots, language learning platforms, and natural language processing systems provide personalized, adaptive, and interactive learning experiences. The study analyzes the effectiveness of these tools in improving students' language skills. The results indicate that integrating AI into language education enhances motivation, promotes independent learning, and improves overall proficiency.

Keywords: Artificial Intelligence, English Language Teaching, Computer Engineering Students, Adaptive Learning, Chatbots, NLP, Digital Education, Language Skills.

INTRODUCTION

In the context of rapid globalization and technological advancement, English has become the dominant language of communication in science, technology, and engineering fields. In particular, Computer Engineering students are required to possess a high level of English proficiency, as most programming languages, technical documentation, research publications, and professional interactions are conducted in English (Warschauer, 2011)[1]. Consequently, the integration of effective language teaching methodologies into technical education has become an urgent priority. Traditional approaches to English language teaching often rely on standardized curricula and teacher-centered instruction, which may not adequately address the diverse needs of learners with strong technical backgrounds. Such methods frequently lack personalization, interactivity, and immediate feedback, which are essential components for effective language acquisition in the digital age (Kukulska-Hulme, 2020)[2]. As a result, there is a growing demand for innovative pedagogical strategies that can enhance both engagement and learning outcomes.

[1] Warschauer, M. (2011). *Learning in the Cloud: How (and Why) to Transform Schools with Digital Media*. New York, NY: Teachers College Press.
[2] Kukulska-Hulme, A. (2020). Mobile-assisted language learning [Revised edition]. In C. A. Chapelle (Ed.), *The Concise Encyclopedia of Applied Linguistics* (pp. 1–7). Wiley-Blackwell. https://doi.org/10.1002/9781405198431.wbeal0768.pub2

Artificial Intelligence (AI) has emerged as a transformative force in modern education, offering new possibilities for personalized and adaptive learning. AI-powered tools, including chatbots, intelligent tutoring systems, and Natural Language Processing (NLP) applications, enable learners to interact with language in real-time and receive instant feedback on their performance (Holmes, Bialik, & Fadel, 2019)[3]. These technologies facilitate individualized learning paths, allowing students to progress at their own pace while focusing on specific linguistic challenges. Moreover, the application of AI in English language teaching is particularly relevant for Computer Engineering students, as it aligns with their technical competencies and interests. The use of AI tools not only improves language skills but also enhances digital literacy and problem-solving abilities, thereby creating a multidisciplinary learning environment. According to Luckin (2018)[4], AI-driven educational systems can significantly improve learner autonomy and motivation by providing tailored learning experiences.

Despite its numerous advantages, the integration of AI into language education also presents certain challenges, including issues related to reliability, over-dependence on technology, and the potential reduction of human interaction in the learning process. Therefore, it is essential to adopt a balanced approach that combines AI-based tools with effective pedagogical guidance.

This study aims to explore modern methods of teaching English through artificial intelligence tools for Computer Engineering students, with a particular focus on their effectiveness, benefits, and limitations in contemporary educational settings.

METHODS

This study employs a mixed-methods approach to investigate the effectiveness of artificial intelligence (AI) tools in teaching English to Computer Engineering students. The research combines both qualitative and quantitative methods to ensure a comprehensive analysis of the learning outcomes. The participants of the study consisted of undergraduate Computer Engineering students at Nordic International University. A total of 40 students were involved and divided into two groups: a control group and an experimental group. The control group was taught using traditional teaching methods, while the experimental group was exposed to AI-based learning tools such as chatbots, adaptive language learning platforms, and automated feedback systems. Data collection was carried out through pre-tests and post-tests to measure students' language proficiency, as well as questionnaires and interviews to evaluate their learning experiences. The use of AI tools allowed students to receive immediate feedback and personalized learning support, which are considered essential factors in modern education (Holmes et al., 2019).

The collected data were analyzed using comparative and descriptive statistical methods to determine the impact of AI integration on students' performance.

RESULTS

The results of the study demonstrate a statistically significant improvement in the English language proficiency of students who were exposed to AI-based learning

[3] Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial Intelligence in Education: Promises and Implications for Teaching and Learning*. Boston, MA: Center for Curriculum Redesign.
[4] Luckin, R. (2018). *Machine Learning and Human Intelligence: The Future of Education for the 21st Century*. London: UCL Institute of Education Press.

tools compared to those in the control group. The analysis of pre-test and post-test scores revealed that while both groups showed some level of progress, the experimental group achieved considerably higher gains across all measured language skills. In particular, the most notable improvement was observed in productive skills such as speaking and writing. Students in the experimental group showed enhanced fluency, better sentence structure, and increased confidence in expressing their ideas in English. This can be attributed to the continuous interaction with AI-powered chatbots and writing assistants, which provided immediate corrective feedback and suggestions. In contrast, the control group demonstrated slower progress, especially in speaking skills, due to limited practice opportunities in traditional classroom settings. Quantitative analysis indicated that the average post-test scores of the experimental group increased by approximately 20–25% compared to their initial results, whereas the control group showed an improvement of only 10–12%. Furthermore, error rates in grammar and vocabulary usage significantly decreased among students using AI tools. This supports the argument that real-time feedback plays a crucial role in language acquisition (Holmes et al., 2019).

In addition to performance-based results, qualitative data collected through questionnaires and interviews provided further insights into students' experiences. A majority of participants (over 80%) in the experimental group reported that AI tools made learning more engaging and less stressful. They highlighted the benefits of personalized learning paths, which allowed them to focus on their individual weaknesses. Many students also appreciated the flexibility of learning anytime and anywhere, which increased their overall exposure to the language. Another important finding is related to learner autonomy. Students who used AI-based tools demonstrated a higher level of independent learning behavior. They were more likely to practice English outside the classroom, use additional resources, and monitor their own progress. This aligns with previous research suggesting that AI-enhanced environments foster self-directed learning (Luckin, 2018).

However, the results also revealed certain limitations. A small number of students (approximately 10–15%) reported difficulties in fully trusting AI-generated feedback, particularly in complex grammatical structures and context-based translations. Additionally, some participants expressed a preference for human interaction, especially when dealing with nuanced language use and cultural aspects of communication.

Overall, the findings confirm that the integration of artificial intelligence tools significantly enhances the effectiveness of English language learning for Computer Engineering students. The combination of quantitative improvements and positive learner perceptions indicates that AI-based methods provide a powerful supplement to traditional teaching approaches.

DISCUSSION

The findings of this study provide strong evidence that the integration of artificial intelligence (AI) tools into English language teaching significantly enhances learning outcomes for Computer Engineering students. The observed improvement in language proficiency, particularly in productive skills such as speaking and writing, confirms the effectiveness of AI-driven educational approaches. These results are consistent with previous research emphasizing the role of AI in creating adaptive and personalized learning environments (Holmes et al., 2019).

One of the most important aspects highlighted by this study is the role of personalization in language learning. AI-based systems are capable of analyzing learners' performance and adjusting content according to their individual needs. This individualized approach allows students to focus on their specific weaknesses, thereby increasing the efficiency of the learning process. Such findings support the argument that personalized learning environments contribute significantly to better academic performance and learner satisfaction (Kukulska-Hulme, 2020).

Another key point of discussion is the increase in learner autonomy and motivation. The results show that students who used AI tools were more engaged and willing to practice English outside the classroom. This can be explained by the interactive and user-friendly nature of AI applications, which provide immediate feedback and create a low-anxiety learning environment. According to Luckin (2018), AI technologies encourage self-directed learning by enabling students to take control of their educational experience, which ultimately leads to deeper learning outcomes.

Furthermore, the study highlights the compatibility of AI-based language learning with the cognitive and technical profiles of Computer Engineering students. Due to their familiarity with digital technologies, these students are more likely to effectively utilize AI tools, which enhances both their technical and linguistic competencies. This interdisciplinary integration not only improves language skills but also prepares students for real-world professional environments where both communication and technical expertise are essential.

Despite these advantages, several limitations must be considered. One of the main concerns is the reliability of AI-generated feedback. Although AI systems are highly efficient, they may occasionally produce inaccurate or contextually inappropriate responses, particularly in complex linguistic situations. This limitation suggests that AI tools should be used as supportive instruments rather than replacements for human instructors.

Additionally, the reduction of human interaction in AI-based learning environments may negatively affect the development of communicative competence. Language learning is inherently social, and the absence of real human communication can limit students' ability to develop pragmatic and cultural aspects of language use. Therefore, a balanced approach that combines AI technologies with traditional teaching methods is essential. In conclusion, the discussion confirms that AI-based tools have significant potential to transform English language teaching for Computer Engineering students. However, their successful implementation requires careful integration, continuous monitoring, and active teacher involvement. Future research should focus on improving the accuracy of AI systems and exploring hybrid learning models that effectively combine technological and human elements.

CONCLUSION

In conclusion, this study has demonstrated that the integration of artificial intelligence (AI) tools into English language teaching significantly enhances the learning outcomes of Computer Engineering students. The findings confirm that AI-based approaches provide a more personalized, adaptive, and interactive learning environment, which leads to measurable improvements in students' language proficiency, particularly in speaking and writing skills. The use of AI technologies such as chatbots, adaptive learning platforms, and automated feedback systems enables

students to receive immediate and individualized support, thereby increasing both their engagement and motivation. Moreover, the flexibility offered by these tools allows learners to practice language skills beyond the traditional classroom setting, fostering continuous and self-directed learning. This is especially relevant for Computer Engineering students, whose technical background aligns well with the use of digital and AI-driven tools. At the same time, the study highlights the importance of maintaining a balanced approach to language teaching. While AI tools offer numerous advantages, they should not replace human interaction or the role of the teacher. Instead, they should be integrated as complementary resources that enhance traditional teaching methods. The guidance of instructors remains essential in addressing complex linguistic issues, ensuring accuracy, and supporting the development of communicative competence.

Overall, the integration of artificial intelligence into English language education represents a promising direction for modern pedagogy. It not only improves language acquisition but also prepares students for the demands of a technologically advanced global workforce. Future research should focus on refining AI tools, addressing their limitations, and exploring hybrid teaching models that combine the strengths of both human and artificial intelligence in education.

REFERENCES

1. Beatty, K. (2013). *Teaching and Researching Computer-Assisted Language Learning* (2nd ed.). London: Routledge.
2. Chapelle, C. A. (2003). *English Language Learning and Technology: Lectures on Applied Linguistics in the Age of Information and Communication Technology*. Amsterdam: John Benjamins Publishing.
3. Godwin-Jones, R. (2018). Using mobile technology to develop language skills and cultural understanding. *Language Learning & Technology, 22*(3), 1–17.
4. Heift, T., & Schulze, M. (2015). *Tutorial Computer-Assisted Language Learning*. London: Routledge.
5. Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial Intelligence in Education: Promises and Implications for Teaching and Learning*. Boston, MA: Center for Curriculum Redesign.
6. Kukulska-Hulme, A. (2020). Mobile-assisted language learning. In C. A. Chapelle (Ed.), *The Concise Encyclopedia of Applied Linguistics* (2nd ed., pp. 1–7). Wiley-Blackwell. https://doi.org/10.1002/9781405198431.wbeal0768.pub2
7. Luckin, R. (2018). *Machine Learning and Human Intelligence: The Future of Education for the 21st Century*. London: UCL Institute of Education Press.
8. Reinders, H., & White, C. (2016). 20 years of autonomy and technology: How far have we come and where to next? *Language Learning & Technology, 20*(2), 143–154.
9. Warschauer, M. (2011). *Learning in the Cloud: How (and Why) to Transform Schools with Digital Media*. New York, NY: Teachers College Press.