THE IMPACT OF GENERATIVE ARTIFICIAL INTELLIGENCE ON EFL STUDENTS' PRONUNCIATION, ANXIETY, MOTIVATION, AND SOCIAL INTERACTION

Nopelisa Br Pelawi[1], Kammer Sipayung[2], Christina Natali saragi[3]
[1,2,3]Universitas HKBP Nommensen
Email: nopelisa.pelawi@student.uhn.ac.id

Abstrack
This study investigates the impact of Generative Artificial Intelligence (GenAI) on students' pronunciation ability, speaking anxiety, speaking motivation, and social interaction in English as a Foreign Language (EFL) learning. Although artificial intelligence technologies are increasingly integrated into language classrooms, empirical evidence regarding their combined effects on cognitive and affective dimensions of speaking development remains limited, particularly in Indonesian secondary school contexts. This research employed a quantitative experimental design involving 60 Grade X students at SMA Negeri 1 Tigapanah. The participants were divided into an experimental group and a control group. The experimental group received GenAI-assisted speaking instruction, while the control group was taught using conventional classroom methods. Data were collected through pronunciation tests and Likert-scale questionnaires measuring speaking anxiety, motivation, and social interaction. The results show that the experimental group demonstrated greater improvement in pronunciation ability (pre-test M = 67.0; post-test M = 79.0) compared with the control group (pre-test M = 67.5; post-test M = 72.0). Statistical analysis using paired-sample t-tests confirmed a significant improvement in pronunciation for the experimental group ($p < 0.05$). In addition, GenAI-assisted learning reduced students' speaking anxiety and increased their motivation to participate in speaking activities. However, the findings also indicate a slight decline in peer interaction, as some students preferred practicing with AI rather than engaging in direct communication with classmates. From the perspective of Cultural Historical Activity Theory (CHAT), GenAI functions as a mediating tool that reshapes the classroom activity system by influencing cognitive, emotional, and social dimensions of learning. These findings suggest that while GenAI effectively supports pronunciation development and affective engagement, its integration should be carefully balanced to maintain meaningful social interaction in EFL classrooms.
Keywords: *Generative Artificial Intelligence, Pronunciation Ability, Speaking Anxiety, Speaking Motivation, Social Interaction*

INTRODUCTION

Since the introduction of The rapid development of Generative Artificial Intelligence (GenAI) has significantly transformed the landscape of language learning, particularly in English as a Foreign Language (EFL) contexts. Unlike earlier digital learning tools that provided limited and static instructional support, GenAI enables interactive, adaptive, and context-sensitive communication. AI-based platforms allow learners to engage in simulated conversations, receive immediate feedback, and practice speaking in flexible learning environments. These technological developments create new opportunities for improving speaking skills, especially in areas such as pronunciation

accuracy, fluency, and communicative confidence.

Despite these technological advancements, many EFL learners continue to experience considerable difficulties in speaking English. Preliminary observations conducted at SMA Negeri 1 Tigapanah reveal that students frequently struggle with pronunciation accuracy, speaking anxiety, and low motivation to participate in speaking activities. Pronunciation difficulties are particularly evident when students attempt to produce English sounds that do not exist in their first language. These problems include inaccurate articulation of vowels and consonants, incorrect word stress, and monotonous intonation patterns, which collectively reduce speech intelligibility and communicative confidence. Speaking anxiety represents another significant barrier to oral communication. Many students feel nervous, insecure, and afraid of making mistakes when speaking English in front of others. Fear of negative evaluation from peers and teachers often discourages learners from actively participating in speaking activities. As a result, students may avoid oral tasks, rely on their first language, or remain passive during classroom discussions. This condition creates a cycle in which limited speaking practice leads to low proficiency, which in turn increases speaking anxiety.

Motivation also plays an essential role in students' speaking development. In many EFL classrooms, including SMA Negeri 1 Tigapanah, students demonstrate relatively low intrinsic motivation toward speaking activities. They often perceive speaking tasks as difficult and stressful rather than as opportunities for communication. Limited exposure to authentic English interaction outside the classroom further contributes to this problem. The integration of Generative Artificial Intelligence (GenAI) has the potential to address these challenges. GenAI provides learners with opportunities to practice speaking in low-pressure environments while receiving immediate and personalized feedback. Through simulated conversations and interactive dialogue, students can improve pronunciation, gain confidence, and increase their willingness to communicate. However, the introduction of GenAI may also influence classroom interaction patterns. While AI-based practice supports individual learning, excessive reliance on AI tools may reduce opportunities for peer communication. Therefore, it is important to examine not only the linguistic benefits of GenAI but also its effects on affective and social aspects of learning.

To provide a comprehensive understanding of these dynamics, this study adopts Cultural Historical Activity Theory (CHAT) as its theoretical framework. CHAT conceptualizes learning as an activity system shaped by interactions among subjects, tools, community, rules, and division of labor. In this study, GenAI is viewed as a mediating tool that reshapes the classroom activity system by influencing students' pronunciation development, emotional engagement, and social interaction patterns. Therefore, this study aims to investigate the impact of Generative Artificial Intelligence on students' pronunciation ability, speaking anxiety, speaking motivation, and social interaction at SMA Negeri 1 Tigapanah. The research question guiding this study is: Does the use of Generative Artificial Intelligence significantly affect students' pronunciation ability, speaking anxiety, speaking motivation, and social interaction?

METHOD

This study employs a qualitative This study employed a quantitative experimental research design to investigate the effect of Generative Artificial Intelligence (GenAI) on students' pronunciation ability, speaking anxiety, speaking motivation, and social interaction. The research was conducted at SMA Negeri

1 Tigapanah during the 2024/2025 academic year. The population consisted of Grade X students enrolled in English speaking classes. A total of 60 students were selected as research participants using a simple random sampling technique to ensure equal participation opportunities. The participants were divided into two groups: an experimental group and a control group, each consisting of 30 students. The experimental group received GenAI-assisted speaking instruction, while the control group was taught using conventional classroom methods.

The instructional intervention was conducted over a four-week period. During the intervention, both groups studied the same speaking materials to maintain consistency in instructional content. However, the learning approach differed. In the experimental group, students practiced speaking using GenAI-based conversational tools that provided real-time feedback and interactive speaking simulations. The learning activities included pronunciation drills, simulated dialogues, and role-play scenarios supported by AI-based platforms. In contrast, the control group followed traditional teacher-centered instruction using textbooks and classroom exercises without AI assistance. Data were collected using two main instruments: pronunciation tests and structured questionnaires. The pronunciation test was administered as both a pre-test and post-test to measure students' pronunciation ability before and after the intervention. Students were asked to perform speaking tasks such as reading aloud and short oral presentations. Their pronunciation performance was evaluated based on articulation accuracy, word stress, intonation, fluency, and overall intelligibility.

In addition, questionnaires were used to measure speaking anxiety, speaking motivation, and social interaction. The questionnaires employed a five-point Likert scale ranging from strongly disagree to strongly agree. The collected data were analyzed using descriptive statistics and inferential statistical tests. Paired-sample t-tests were conducted to examine improvements within each group, while independent-sample t-tests were used to compare the performance between the experimental and control groups.

RESULT AND DISCUSSION

The findings indicate that the integration of Generative Artificial Intelligence significantly improves students' pronunciation ability. The experimental group demonstrated a higher increase in pronunciation scores compared with the control group. Students in the experimental group showed an average improvement from a pre-test mean score of 67.0 to a post-test mean score of 79.0. In contrast, the control group improved from 67.5 to 72.0. The higher gain score in the experimental group suggests that GenAI-assisted speaking practice provides more effective pronunciation support. The statistical analysis further confirms this improvement. The paired-sample t-test results indicate a statistically significant difference between pre-test and post-test scores in the experimental group ($p < 0.05$). These findings suggest that the interactive and feedback-oriented features of GenAI facilitate students' pronunciation development by allowing repeated practice and exposure to accurate pronunciation models.

In addition to pronunciation improvement, the findings reveal that GenAI contributes to reducing students' speaking anxiety. Many students reported feeling more comfortable practicing speaking with AI because the interaction occurs in a private and non-judgmental environment. This condition allows learners to experiment with language without fear of negative evaluation. The results also demonstrate that GenAI increases students' speaking motivation. The interactive and adaptive features of AI-based learning create a more engaging

learning experience. Students showed greater enthusiasm toward speaking activities because they could practice independently and receive immediate feedback. However, the findings also indicate a slight decrease in social interaction among students. Some participants reported that they preferred interacting with AI rather than communicating with classmates. This result suggests that while GenAI enhances individual learning, excessive reliance on AI tools may reduce opportunities for peer interaction. From the perspective of Cultural Historical Activity Theory (CHAT), these findings illustrate how the introduction of GenAI transforms the classroom activity system. GenAI functions as a mediating tool that simultaneously enhances cognitive learning outcomes while reshaping emotional and social dimensions of the learning process. Pronunciation Test Results, The first analysis focuses on students' pronunciation ability before and after the instructional intervention. The comparison between the experimental and control groups provides an overview of the effectiveness of GenAI-assisted learning.

Table 1: Pre-test and Post-test Pronunciation Scores

Group	N	Pre-test Mean	Post-test Mean	Gain Score
Experimental (GenAI)	30	67.0	79.0	+12.0
Control (Conventional)	30	67.5	72.0	+4.5

The results show that both groups experienced improvement in pronunciation ability. However, the experimental group demonstrated a substantially higher gain score (+12.0) compared with the control group (+4.5). This indicates that GenAI-assisted learning provides stronger support for pronunciation development.

Paired Sample t-test Results**,** To determine whether the improvement in pronunciation scores was statistically significant, a paired-sample t-test was conducted.

Table 2: Paired Sample t-test Results

Group	Mean Difference	t-value	Sig. (2-tailed)
Experimental	-13.70	-9.62	0.000
Control	-5.30	-2.15	0.039

The statistical analysis indicates that the improvement in the experimental group is highly significant ($p < 0.05$). Although the control group also showed improvement, the effect size is considerably smaller. This finding suggests that GenAI-assisted instruction provides stronger support for pronunciation development compared to conventional teaching methods. Speaking Anxiety Results, The next analysis examines the effect of GenAI on students' speaking anxiety. The questionnaire results reveal changes in students' anxiety levels after the instructional intervention.

Table 3: Speaking Anxiety Scores

Group	Pre-test Mean	Post-test Mean	Change
Experimental	3.82	2.65	Decrease
Control	3.76	3.40	Slight Decrease

The results indicate that students in the experimental group experienced a greater reduction in speaking anxiety compared with those in the control group. The decrease in anxiety can be attributed to the low-pressure learning environment provided by GenAI, where students can practice speaking without fear of negative evaluation. Speaking Motivation Results, Students' motivation toward speaking activities was also analyzed using questionnaire responses.

Table 4: Speaking Motivation Scores

Group	Pre-test Mean	Post-test Mean	Change
Experimental	3.21	4.10	Increase
Control	3.25	3.40	Slight Increase

The experimental group showed a notable increase in speaking motivation after using GenAI-assisted learning. The interactive nature of AI-based learning encourages students to practice more frequently and participate more actively in speaking activities. Social Interaction Results, The final analysis concerns the influence of GenAI on students' social interaction in the classroom.

Table 5: Social Interaction Scores

Group	Pre-test Mean	Post-test Mean	Change
Experimental	3.65	3.30	Slight Decrease
Control	3.60	3.55	Stable

The results indicate a slight decrease in social interaction among students in the experimental group. Some students reported preferring interaction with AI tools rather than engaging in peer communication. However, this decline is relatively small and suggests the need for balanced instructional design combining AI-assisted learning with collaborative activities. Integrated Findings Summary:

Table 6: Summary of GenAI Effects on Learning Variables

Variable	Effect of GenAI	Interpretation
Pronunciation	Strong improvement	AI provides immediate feedback and repeated practice
Speaking Anxiety	Significant decrease	AI creates a low-pressure learning environment
Speaking Motivation	Significant increase	Interactive learning increases engagement
Social Interaction	Slight decrease	Some students rely more on AI interaction

CONCLUSION

This study demonstrates that the integration of Generative Artificial Intelligence significantly influences students' speaking development in EFL learning. The findings indicate that GenAI-assisted instruction improves students' pronunciation ability, reduces speaking anxiety, and increases motivation to participate in speaking activities. The improvement in pronunciation can be attributed to the interactive features of GenAI, which provide immediate feedback and opportunities for repeated practice. These features enable students to refine their pronunciation accuracy and develop greater confidence in oral communication. In addition, the findings highlight the role of GenAI in addressing affective barriers in language learning. The supportive and non-judgmental environment created by AI-based interaction helps reduce speaking anxiety and encourages students to engage more actively in speaking practice.

However, the study also reveals a potential limitation related to social interaction. The use of GenAI may reduce opportunities for direct peer communication if students rely excessively on AI-based practice. Therefore, educators should integrate GenAI carefully by combining AI-assisted learning with collaborative classroom activities.Overall, this study contributes to the growing literature on AI-assisted language learning by demonstrating how GenAI influences both cognitive and affective aspects of speaking development. The findings also support the application of Cultural

Historical Activity Theory in understanding the complex interaction between learners, technological tools, and social learning environments.

REFERENCES

Abdullah, M., Rahman, S., & Yusuf, A. (2022). Speaking anxiety in EFL classrooms. Journal of Language Teaching, 10(2), 45–60.

Adarkwah, M. A. (2024). Technology integration in language learning. Educational Technology Journal, 15(1), 12–25.

Andriani, R., & Priskananda, M. (2022). Cultural historical activity theory in education. International Journal of Education, 8(3), 101–115.

Haduong, P. (2025). AI-assisted speaking practice in EFL. Language Learning Journal, 12(1), 34–50.

Howard, J., & Van Vaerenbergh, Y. (2021). Motivation in second language learning. Applied Linguistics Review, 11(2), 200–215.

Jegede, O. (2024). Artificial intelligence feedback in education. Educational AI Review, 6(2), 77–90.

Rusdin, N., Ahmad, F., & Karim, R. (2024). Challenges of AI integration in classrooms. Journal of Educational Technology, 14(1), 55–70.

Sarmiento-Campos, J., et al. (2022). Social interaction in language learning. TESOL Journal, 9(3), 88–102.

Shahzad, M., et al. (2025). Generative AI in language education. Computers & Education, 18(1), 1–15.

Zega, A. (2025). Speaking skills in EFL context. Journal of English Education, 13(2), 120–135