

## ENHANCING NON-ENGLISH MAJOR STUDENTS' SPEAKING SKILLS: THE ROLE OF AI TOOLS IN SELF-LEARNING AT A UNIVERSITY IN HANOI

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<p><b>Received:</b> 21/02/2025</p> <p><b>Revised:</b> 10/04/2025</p> <p><b>Published:</b> 13/04/2025</p>	<p>This study investigated the application of artificial intelligence tools in enhancing the speaking skills of non-English major students at a university in Hanoi - Hanoi University of Civil Engineering. The study employed a mixed-methods approach, including experiments, surveys, and interviews to evaluate the impact of AI tools such as speech recognition and feedback systems. Data were collected from 120 students who used AI-based tools for self-learning over a three-month period. The results showed that students using AI tools demonstrated significant improvements in pronunciation accuracy, fluency, and learner confidence with an average increase of 20% in the oral proficiency test scores. Moreover, students reported enhanced motivation and confidence in speaking English. The findings suggested that AI tools played a crucial role in overcoming language barriers and facilitating autonomous learning. This study contributed to the understanding of integrating AI in language education and highlighted the potential for further applications in other skill areas.</p>
<p><b>KEYWORDS</b></p> <p>Self-learning</p> <p>AI tools</p> <p>Speaking skills</p> <p>Non-English major students</p> <p>Pronunciation accuracy, fluency and learner confidence</p>	

## NÂNG CAO KỸ NĂNG NÓI CỦA SINH VIÊN KHÔNG CHUYÊN ANH: VAI TRÒ CỦA CÁC CÔNG CỤ AI TRONG TỰ HỌC TẠI MỘT TRƯỜNG ĐẠI HỌC Ở HÀ NỘI

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THÔNG TIN BÀI BÁO	TÓM TẮT
<p><b>Ngày nhận bài:</b> 21/02/2025</p> <p><b>Ngày hoàn thiện:</b> 10/04/2025</p> <p><b>Ngày đăng:</b> 13/04/2025</p>	<p>Nghiên cứu này điều tra việc ứng dụng các công cụ trí tuệ nhân tạo trong việc nâng cao kỹ năng nói của sinh viên không chuyên tiếng Anh tại một trường đại học ở Hà Nội – Trường Đại học Xây dựng Hà Nội. Nghiên cứu sử dụng phương pháp hỗn hợp, bao gồm khảo sát, phỏng vấn và thực nghiệm nhằm đánh giá tác động của các công cụ AI như nhận diện giọng nói và hệ thống phản hồi. Dữ liệu được thu thập từ 120 sinh viên đã sử dụng các công cụ AI để tự học trong thời gian ba tháng. Kết quả cho thấy sinh viên sử dụng công cụ AI có sự cải thiện đáng kể về độ trôi chảy và độ chính xác phát âm, với mức tăng trung bình 20% trong điểm bài kiểm tra năng lực nói. Hơn nữa, sinh viên cũng báo cáo sự gia tăng động lực và sự tự tin khi nói tiếng Anh. Những phát hiện này cho thấy rằng các công cụ AI có thể đóng vai trò quan trọng trong việc vượt qua rào cản ngôn ngữ và hỗ trợ học tập tự chủ. Nghiên cứu này đóng góp vào việc hiểu rõ hơn về việc tích hợp AI trong giáo dục ngôn ngữ và nhấn mạnh tiềm năng ứng dụng rộng rãi trong các kỹ năng khác.</p>
<p><b>TỪ KHÓA</b></p> <p>Tự học</p> <p>Công cụ trí tuệ nhân tạo</p> <p>Kỹ năng nói</p> <p>Sinh viên không chuyên tiếng Anh</p> <p>Độ chính xác phát âm, độ trôi chảy và sự tự tin của người học</p>	

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## 1. Introduction

In recent years, self-learning has gained increasing attention as an essential approach for language acquisition, especially among non-English major students. The self-learning process is a learning method in which students take the initiative in acquiring knowledge and skills without direct supervision, relying on digital tools, self-assessment, and independent practice. However, non-English major students face significant challenges in developing their speaking skills through self-learning.

Speaking skills, in the context of this study, consist of three key components: pronunciation, fluency, and learner confidence. Pronunciation refers to the accuracy of articulating words and sounds, fluency is the ability to speak smoothly and coherently, and learner confidence represents the level of self-assurance in speaking English. These factors play a crucial role in effective verbal communication and are often the primary areas of difficulty for self-learning students.

Many students struggle with pronunciation due to the influence of their native language, leading to mispronunciations and incorrect stress patterns, which hinder effective communication [1]. Additionally, the absence of direct feedback from instructors or native speakers makes it difficult for students to correct errors and improve their pronunciation skills [2].

Furthermore, self-learning students often lack a suitable environment for speaking practice. In traditional classroom settings, students have opportunities to interact with peers and instructors, but self-learners may not have access to structured speaking practice opportunities. Without conversation partners, they may resort to passive learning methods such as listening or reading rather than engaging in verbal communication activities. This limitation significantly impacts their ability to develop fluency [3].

Another common challenge is the lack of confidence in speaking English. Many non-English major students feel anxious or hesitant when speaking due to fear of making mistakes, negative self-perceptions, or lack of exposure to real-life communication situations. Psychological barriers such as speaking anxiety and low self-confidence significantly hinder students' ability to communicate effectively [4]. This lack of confidence often leads to avoidance of speaking practice, slowing down the improvement of fluency and pronunciation. The absence of systematic guidance and real-time feedback further exacerbates these issues, making it difficult for students to achieve fluency and accuracy in spoken English [5].

Given these challenges, technological advancements, particularly AI-powered tools, offer promising solutions to enhance speaking skills for self-learners. AI-powered tools, such as Duolingo and ELSA Speak, offer real-time feedback on pronunciation, fluency, and intonation, potentially addressing some of the barriers faced by self-learning students [6]. Research has shown that AI-powered applications, such as ELSA Speak, can significantly improve pronunciation skills among language learners [7]. However, despite the growing adoption of AI in education, there remains a lack of empirical research investigating the extent to which these tools improve speaking skills, particularly in the context of non-English major students in Vietnam.

The primary objective of this study was to evaluate the effectiveness of AI-powered language learning tools in improving pronunciation, fluency, and learner confidence among non-English major students. Specifically, this study sought to determine whether these tools could effectively enhance self-directed speaking practice and address key challenges faced by learners. By doing so, the research contributed to a better understanding of the role of AI in fostering self-learning and improving speaking performance. Building on these discussions, this study sought to address a key research question: To what extent do AI tools improve pronunciation, fluency, and confidence in the self-learning process of non-English major students?

To achieve these objectives, a mixed-methods approach was employed, incorporating experimental research, surveys, interviews, and AI usage data analysis. The study involved 120 non-English major students divided into an experimental group using AI-based learning tools and

a control group following traditional self-study methods. Pre- and post-tests were conducted to measure improvements in speaking skills, and qualitative data from interviews were analyzed to gain deeper insights into students' experiences.

The remainder of this article is structured as follows: Section 2 describes the research methodology, including participant selection, AI tool implementation, and data analysis techniques. Section 3 presents the results and discusses their implications, comparing findings with prior research. Finally, section 4 provides conclusions and suggests directions for future research.

## 2. Methods

This research employed a mixed-method approach to explore the impact of AI tools on students' speaking skills. The participants included 120 non-English major students from Hanoi University of Civil Engineering, divided into experimental and control groups. The experimental group used AI-based tools such as Duolingo's speech recognition module and ELSA Speak, while the control group relied on traditional self-learning methods. The study design incorporated the following components:

### 2.1. Participants and sampling

A total of 120 students were randomly selected using a stratified random sampling method. Participants were first categorized based on their English proficiency levels (determined through a pre-test) and then randomly assigned to either the experimental group (60 students) or the control group (60 students) using a computerized randomization tool. This ensured a balanced distribution of proficiency levels across both groups.

### 2.2. AI tools and traditional methods

The experimental group utilized Duolingo and ELSA Speak for daily speaking practice. Both tools have free and premium versions; for this study, students primarily used the free versions. Duolingo's speech recognition module provided pronunciation feedback, while ELSA Speak offered real-time scoring and corrective feedback on pronunciation and fluency. Some students voluntarily upgraded to the premium versions, which provided additional exercises and detailed analytics, but this was not a requirement.

Students used their personal smartphones to access these AI tools, ensuring flexibility and convenience. However, some students opted to use laptops for a better user experience, particularly when engaging in structured practice sessions.

The AI tools covered various speaking topics, including everyday conversations, academic discussions, and professional communication. The topics were carefully selected to align with the university's English curriculum, ensuring relevance to classroom learning. This alignment allowed students to reinforce classroom knowledge through AI-assisted practice.

The control group followed a structured self-directed learning schedule, which required them to engage in speaking practice using traditional methods, such as textbook exercises, peer discussions, and audio-based repetition drills. They were expected to spend at least 30 minutes daily practicing speaking skills, similar to the AI group. However, without real-time feedback, their progress depended on self-evaluation and occasional peer corrections.

Both groups completed a pre-test and post-test to assess their speaking proficiency. The speaking tests were designed based on the CEFR (Common European Framework of Reference for Languages) guidelines and included three sections: (1) describing a picture, (2) answering open-ended questions, and (3) engaging in a role-play conversation. The pre-test and post-test were different but had equivalent levels of difficulty to ensure validity. Students' responses were recorded and evaluated by two independent raters.

To ensure interrater reliability, the raters were trained using a standardized rubric before grading the tests. The interrater reliability score was calculated using Cohen's kappa coefficient

to measure the level of agreement between raters. Any discrepancies in scoring were discussed and resolved before finalizing the results.

### **2.3. Teacher supervision and AI usage monitoring**

Teachers monitored both groups to ensure compliance with the learning schedule. Weekly check-ins were conducted where students reported their practice hours and challenges. For the experimental group, AI usage logs were reviewed to track engagement levels, including time spent on the applications and lesson completion rates. This data helped assess whether AI tool usage was consistent across participants.

To ensure consistency in self-directed learning, teachers provided structured guidelines for both groups. The control group submitted weekly progress reports detailing their learning activities, while the experimental group's AI usage data was reviewed for adherence to the prescribed learning schedule. Any discrepancies in usage levels were addressed through reminders and additional support.

### **2.4. Data collection and analysis**

Data were collected through pre- and post-tests, surveys, and interviews. The speaking proficiency test evaluated fluency, pronunciation, and vocabulary usage. The survey measured students' confidence in speaking English before and after the intervention.

A 10-item Likert-scale survey was used to measure confidence levels in speaking English. The survey focused on students' self-perceived pronunciation accuracy, fluency, and comfort when speaking in different contexts.

Semi-structured interviews were conducted with selected students from both groups to gather qualitative insights into their learning experiences. The interview questions focused on their perceived progress, challenges faced, and the effectiveness of AI tools compared to traditional methods. A key concern was the variance in learning engagement among students. While most students adhered to the 30-minute daily practice requirement, some engaged more frequently, while others required reminders to maintain consistency. This variability was noted in the data analysis to account for potential differences in learning outcomes.

By addressing these methodological aspects, this study ensured transparency and clarity in the research design, providing a comprehensive understanding of AI's role in self-directed language learning.

### **2.5. Procedure**

The study followed a structured, step-by-step procedure to ensure consistency among participants. During the orientation phase, both groups attended an introductory session where the study's purpose and expectations were explained. Participants in the experimental group received the additional training on effectively using the AI tools.

The implementation phase lasted for 12 weeks. The experimental group was required to use the AI tools for 30 minutes daily, focusing on speaking exercises, while the control group adhered to a self-directed learning schedule using traditional resources. Weekly progress meetings were conducted to resolve technical issues and encourage adherence to the study plan.

Throughout the feedback and monitoring phase, instructors tracked participants' progress through the weekly updates. AI tools' feedback logs were reviewed to identify recurring pronunciation challenges. In the testing and evaluation phase, all participants completed the oral proficiency test both before and after the intervention. At the conclusion of the study, surveys were distributed, and interviews were conducted with selected participants to gather further insights.

### **2.6. Data analysis**

The analysis of data combined both quantitative and qualitative methods to provide a holistic

understanding of the study outcomes. Quantitative analysis included comparing pre- and post-test scores using paired t-tests to identify statistically significant improvements in speaking proficiency. Additionally, the improvement rates of the experimental and control groups were compared using independent sample t-tests. Survey results were aggregated and analysed using descriptive statistics to identify patterns and trends.

Qualitative analysis involved a thematic examination of interview transcripts to uncover recurring themes such as motivation, confidence, and the usability of AI tools. Open-ended survey responses were coded and integrated with interview findings, enabling a deeper understanding of participants' experiences and perspectives.

### 3. Results and Discussion

The study revealed that students in the experimental group achieved significantly higher improvements in speaking proficiency compared to the control group. The average oral proficiency test scores increased by 20%, with notable enhancements in pronunciation and fluency. This significant improvement suggested that AI-powered tools provided structured, engaging, and effective language practice that went beyond traditional self-directed learning methods.

#### 3.1. Quantitative results

Table 1. Quantitative results

Aspect	Experimental group (AI-assisted learning)	Control group (Traditional self-learning)
Average test score (Pre)	65	66
Average test score (Post)	78	70
Improvement (%)	20%	6%
Student Satisfaction (%)	85%	60%

Table 1 presented the pre-test and post-test scores for both groups. The experimental group showed a significant improvement in speaking proficiency, with an average increase of 20% in their test scores, while the control group exhibited a more modest 6% improvement. These results indicated that AI-assisted learning substantially enhances language acquisition, particularly in areas requiring real-time corrective feedback.

One possible explanation for the superior performance of the experimental group was the immediate and targeted feedback provided by AI tools. Unlike traditional learning methods, which often lacked instant correction, AI-powered speech recognition systems analyzed spoken input in real-time and offered precise pronunciation adjustments. Studies by [6] and [8] supported these findings, showing that AI tools reinforced accurate pronunciation and fluency by engaging learners through adaptive feedback mechanisms.

Additionally, AI-driven gamification likely contributed to increased student motivation and consistent practice. Features such as progress tracking, achievement badges, and interactive exercises encouraged sustained engagement, making language learning more dynamic and enjoyable. These motivational elements aligned with previous research by [9], which found that gamified AI tools fostered long-term language retention and reduced learner anxiety.

While the control group also demonstrated some improvement, the relatively lower increase suggested that traditional self-learning strategies might be less effective in addressing pronunciation and fluency challenges. Without real-time corrective feedback and interactive reinforcement, learners might struggle to recognize and correct their mistakes autonomously. These findings highlighted the potential for AI to bridge critical gaps in conventional language learning methodologies.

#### 3.2. Qualitative insights

Qualitative insights from the interviews highlighted several important themes. Many

participants in the experimental group reported enhanced motivation, attributing their increased enthusiasm for learning to the engaging and interactive nature of AI tools. These students frequently cited real-time feedback as a crucial factor in building confidence and reducing anxiety when speaking English.

One student stated, "ELSA Speak helped me recognize my pronunciation mistakes immediately, which made me feel more secure when speaking." Another participant emphasized the engagement factor: "Duolingo's speech recognition was fun and interactive, making me want to practice every day." This indicated that AI tools not only provided linguistic benefits but also fostered a more positive and proactive learning attitude.

Furthermore, the accessibility and user-friendliness of AI tools were widely praised. Even students with limited technological experience found these platforms easy to navigate, suggesting that AI-driven learning solutions can be effectively implemented across diverse learner demographics. The convenience of mobile-based learning also allowed students to practice speaking anytime and anywhere, thereby promoting more frequent and consistent engagement with the language.

Survey responses indicated that 85% of students found AI tools helpful in identifying and correcting pronunciation errors. The AI-driven approach was particularly effective in addressing individual learning needs, fostering learner autonomy, and reducing the anxiety associated with speaking practice. Compared to traditional methods, which may rely on static exercises or instructor-led correction, AI tools provided a personalized and adaptive learning experience tailored to each student's strengths and weaknesses.

Moreover, these findings suggested that integrating AI into self-learning processes could significantly enhance language outcomes, especially for non-English major students who might lack access to traditional language learning resources. The results aligned with prior research emphasizing the role of AI in democratizing education, making high-quality language training more accessible to a broader range of learners.

### ***3.3. Comparison with previous studies***

This study expanded on the previous research by examining AI-assisted language learning in real-world contexts, unlike many prior studies conducted in controlled settings. Wang & Liu [6] focused on algorithm accuracy, while this study explored practical challenges like inconsistent technology use and varying motivation levels among non-English major students.

A key contribution was its focus on an often-overlooked population—non-English majors with intermediate proficiency. Madhavi et al. [10] emphasized the need for more inclusive research, and this study fills that gap by demonstrating AI's effectiveness in enhancing speaking skills even for less confident learners.

Findings matched with prior research on AI's role in boosting learner confidence and engagement. Kim et al. [8] found that AI chatbots create a low-pressure practice environment, similar to how AI tools in this study reduced speaking anxiety. Li et al. [9] highlighted AI's impact on pronunciation accuracy, echoing students' experiences in this research.

This study also reinforced findings of [11] on structured interactive tasks in distance learning. AI-driven speaking exercises improved engagement more effectively than traditional methods. Unlike prior research that focused on AI's theoretical benefits, this study highlighted its real-world usability, showing that tools like Duolingo and ELSA Speak enhanced accessibility and eased of use. These insights supported efforts to integrate AI into language education more effectively.

## **4. Conclusion**

This study demonstrated that the AI tools were highly effective in improving the speaking skills of non-English major students in autonomous learning contexts. By offering personalized feedback and adaptive learning experiences, AI tools addressed common barriers such as limited resources and lack

of exposure to native speakers. Students using these tools reported significant improvements in fluency, pronunciation, motivation, and confidence. These findings conformed to existing research, affirming the potential of AI to transform language education. However, challenges such as accessibility and technical limitations remained and warranted further investigation.

Future research should explore the long-term impacts of AI tool usage and examine its application across different language skill areas, such as listening, reading, and writing. Furthermore, strategies for broader implementation in various educational contexts, including rural and under-resourced areas, should be a priority. Policymakers and educators are encouraged to collaborate on initiatives that integrate AI tools into curriculum design, ensuring equitable access and training for diverse student populations. These efforts will pave the way for a more inclusive and technology-driven approach to language learning.

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