

## Practicing with AI Conversational Agents and the Reduction of English-Speaking Anxiety: Evidence from First-Year Undergraduates at a Bangladeshi Public University

**Md. Ali Rezwan Talukdar**

*Associate Professor, Department of English, Comilla University, Cumilla, Bangladesh*  
E-mail: rezwan@cou.ac.bd | ORCID: 0009-0000-9792-3271

**Moniruzzaman Bhuiyan**

*Department of English, Comilla University, Cumilla, Bangladesh*  
Email: moniruzzamanbhuiyan99@gmail.com

**Md. Zahid Hossain**

*Department of English, Comilla University, Cumilla, Bangladesh*  
Email: zahidhossainzahidhossain870@gmail.com

### Abstract

Reducing speaking anxiety is essential for developing second-language speaking skills. This paper presents an evidence-based study on the incorporation of AI conversational agents to alleviate English-speaking anxiety among first-year undergraduate EFL learners at a semi-urban public university outside the capital city of Bangladesh. The study examines students' and teachers' perspectives and experiences regarding the use of AI tools for developing English-speaking skills and investigates how these tools can facilitate confidence-building in speaking English. A total of 151 first-year undergraduate students from different disciplines of a public university and five ELT professionals from public and private universities participated in this mixed-methods convergent design study. Data were collected through questionnaires, pre- and post-intervention speaking performance recordings from a group of ten purposively selected participants, and semi-structured teacher interviews. The data were analyzed using both quantitative and qualitative methods. The findings suggest that a careful and systematic approach to incorporating AI conversational agents into English language courses may support learners' English-speaking development. In particular, AI conversational agents may help alleviate English-speaking anxiety, boost learners' confidence, and improve their speaking fluency.

### Article History:

Received: 07/08/2026  
Accepted: 01/09/2026  
Published: 05/10/2026

### Keywords:

AI conversational agent; speaking anxiety; AI intervention; speaking performance; assessment rubric

## Introduction

In Bangladesh, undergraduates usually enter universities from diverse socioeconomic and educational backgrounds. For many learners, participating in an English-speaking classroom can be intimidating. In such situations, learners' motivation, confidence, optimism, and sustained effort, supported by guided instruction, are important for developing English speaking and communicative competence. In this new era of digital technology-mediated and Artificial Intelligence (AI)-assisted language teaching and

learning, the structured use of AI conversational agents for developing English speaking skills warrants further investigation to assess whether they can reduce learners' anxiety and support the development of language competence and learners' speaking experiences in Bangladeshi public universities.

Speaking remains an important means of communication, and English-speaking proficiency is widely valued in Bangladeshi educational and social contexts. Both traditional and innovative approaches are common in teaching English speaking. Research on the integration of AI into English-speaking instruction in specific educational settings in Bangladesh can therefore examine the opportunities and challenges associated with AI-based innovations in English language teaching.

Speaking is often perceived as one of the most anxiety-provoking language skills due to fear of constant mistakes, negative assessment, and limited opportunities for real-life communication. These factors contribute to high levels of speaking anxiety. It is therefore important to explore innovative and engaging approaches that may help learners manage speaking anxiety and frustration. AI conversational agents can be utilized for this purpose in innovative ways. Observing the effectiveness of AI agents in speaking practice to reduce anxiety among first-year undergraduate students at a semi-urban public university in Bangladesh can shed some new light on this understanding.

This study examines students' experiences of AI conversational agents in relation to English-speaking anxiety and speaking performance among first-year undergraduates at a semi-urban public university in Bangladesh. Accordingly, the study addresses the following objectives:

- To identify students' and teachers' current perspectives and experiences regarding the use of AI tools for English-speaking development.
- To examine students' reported and observed changes in speaking anxiety and classroom speaking performance following AI-supported speaking practice.
- To investigate how AI conversational activities facilitate English speaking improvement and oral confidence-building.

## Literature Review

### Learners' Anxiety in English Speaking

Speaking anxiety can constitute a significant psychological barrier to developing English-language fluency, including mental reluctance and hesitation to participate in English interactions (Amoah & Yeboah, 2021; Octaberlina, Muslimin, & Rofiki, 2022). Fear of making mistakes and negative evaluation by peers may contribute to speaking anxiety in conventional classroom settings (Kintsurashvili et al., 2026). Research has examined the root causes of speaking anxiety and its prevalence among students in public and private universities in Bangladesh. Studies have also identified factors such as negative judgment, limited opportunities for communication, and sociocultural background that lead to speaking anxiety among undergraduate learners. Managing speaking anxiety may require consistent and supported practice (Rahman et al., 2024). According to Horwitz et al., there are three types of anxiety associated with foreign language classroom anxiety

(FLCA): communication anxiety, test anxiety, and fear of negative evaluation. One way to reduce this anxiety is to provide appropriate support and feedback, as it provides a positive learning atmosphere (Zarei, Alibakhshi, & Nezakatgoo, 2024). A recent study highlights the potential of AI tools in mitigating speaking anxiety by providing instant feedback and a low-pressure and non-judgmental environment, which assists learners in engaging in speaking without facing any negative judgment (Kintsurashvili et al., 2026; Grab, 2025).

### **Technology-based English Speaking Skill Development**

The integration of artificial intelligence (AI) in language learning has become an increasingly common trend for learners, especially in English as a second language instruction (ESL) (Grab, 2025), which encourages researchers to investigate the potential of AI agents for speaking development. Recent studies show that AI tools, which simulate oral engagement, can substantially mitigate challenges in the English language teaching classroom, and the impact of AI-assisted language learning tools in developing speaking skills has been widely explored, with research indicating that speaking skills can be improved with the assistance of AI applications (Zou et al., 2023). These tools, including AI-assisted conversational agents and chatbot-based platforms, facilitate human-like interaction, foster human engagement in practical discussions, and accelerate oral competence. (Li et al., 2022). In the context of verbal practice, AI-based pronunciation assessment applications scrutinize mispronounced words from an EFL perspective and direct learners toward more accurate language production through feedback (Xiao & Park, 2021). Following Stephen Krashen's second language acquisition theory, which integrates a combination of applied linguistics and adaptive learning technology, it is confirmed that lower anxiety permits the brain to process new knowledge more effectively (Krashen, 1981; Imamah & Suryani, 2025), whereas Vygotsky's sociocultural theory frames learning as a social and interactive process, making language learning more practical (Vygotsky, 1978).

### **English Speaking Practice with AI Conversational Agents**

AI conversational agents, most notably chatbot technology, have emerged as essential tools for improving English-speaking skills among learners, offering personalized and interactive learning in a safe environment (Grab, 2025). Studies of AI chatbots have highlighted their potential to support multiple dimensions of oral performance, including fluency, pronunciation, grammar, and vocabulary (Grab, 2025). For example, these studies highlight that students with positive attitudes toward AI applications may be more willing to engage in AI-supported speaking practice, which may in turn support speaking development through AI-powered apps (Zou et al., 2023). A primary advantage of engaging with AI conversational agents is the potential reduction of English-speaking anxiety (Kintsurashvili et al., 2026; Grab, 2025). These agents work not just as technological tools but as pedagogically structured models aimed at addressing consistent challenges in oral language instruction, including speaking anxiety, inadequate facilities for real-time practice, and limitations of timely and personalized feedback (Hapsari & Wu, 2022), while ensuring learners a safe environment with adaptive and instant feedback (Annamalai et al., 2023). This low-pressure practice facilitates the refinement and development of learners' speaking skills and assists in reducing the psychological impediments of real-world communication.

### **Learners' Low Anxiety & High Motivation with Language Proficiency**

Research reveals a substantial correlation between low anxiety, high motivation, and increased language proficiency (Liu & Huang, 2011), especially while examining the impact of AI conversational agents on English-language development (Kintsurashvili et al., 2026). The inclusion of AI agents offers a low-stakes environment, which is essential for reducing speaking anxiety without the fear of negative evaluation (Grab, 2025). This non-judgmental circumstance allows learners to tackle psychological barriers, including fear of making mistakes and negative judgments, which are prevalent factors in conventional pedagogical settings (Kintsurashvili et al., 2026). This reduction in speaking anxiety may contribute to increased growth in learners' self-confidence and motivation. Participants showed greater self-confidence and attributed their progress to the timely feedback and engaging learning sessions, which were facilitated by AI agents. By lowering speaking anxiety and promoting students' motivation, AI chatbots foster more meaningful language learning (Tran, 2022). Numerous studies have reported that such AI guidance not only helps in developing comprehensibility but also may help learners to improve confidence by reducing speaking anxiety. While students are less anxious and more confident, they are highly motivated to engage in more practice, which is significant for developing oral presentation and enhancing real-world communication skills (Tran, 2022). Such sustained AI-assisted practice may contribute to the development of speaking skills such as fluency, pronunciation, grammar, and vocabulary (Zou et al., 2023). The positive attitudes of students towards AI applications for speaking practice further indicate their usefulness in improving motivation and, therefore, supporting proficiency (Abdelatia, 2026).

### **Tertiary-level Learners' English Anxiety in Bangladesh**

Studies focusing on Bangladeshi public and private universities have reported English-speaking anxiety among learners, associated with fear of negative judgment, teacher-oriented classroom practices, hesitation, and limited facilities for effective communication (Kayum, 2025). Studies conducted in the private universities of Bangladesh additionally demonstrate that English-speaking anxiety is highly prevalent among undergraduate students due to shyness, limited exposure to English, cultural barriers, and fear in terms of classroom participation (Kayum, 2025). In addition, speaking has been recognized as one of the most underrepresented language skills in both rural and urban educational institutions in Bangladesh (Ahmad, 2014; Ahmad, 2017). Recent studies have focused on the potential of AI-driven language-learning platforms in addressing speaking challenges. For instance, AI-based language tutors have been demonstrated to support lower anxiety among EFL learners, while consistent interaction with AI conversational agents may help to lower anxiety levels and improve speaking confidence through immediate feedback and a low-stakes learning environment (Hapsari & Wu, 2022).

### **Research Gap and Synthesis**

Studies investigating the potential role of AI conversational agents in reducing English-speaking anxiety among Bangladeshi university students remain limited. Additionally, evidence from previous literature and research on AI integration in English language skills development has substantially focused on private universities in Bangladesh located in urban areas. Research in semi-urban public universities remains limited, and there is a need for empirical research examining the experiences and potential contributions of AI

conversational agents to English-speaking practice and anxiety among undergraduate learners. An examination of first-year undergraduate students practicing with AI and its potential contribution to reducing English-speaking anxiety may contribute to understanding the details in a Bangladeshi educational context.

## Theoretical Framework

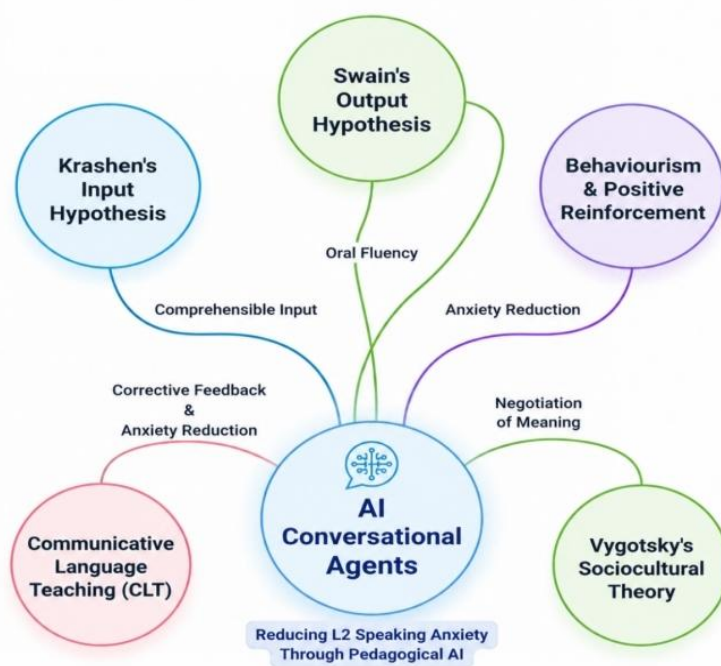


Figure 1: Theoretical Framework

This study is empirically rooted in several complementary theories of second language acquisition (SLA) and language pedagogy: Krashen's Input Hypothesis, Merrill Swain's Output Hypothesis, positive reinforcement from Behaviorism, Communicative Language Teaching (CLT), and Vygotsky's Sociocultural theory. Together, these perspectives provide a theoretical basis for understanding oral proficiency development, the role of feedback, including the potential role of interaction and digital learning practices in addressing fear and anxiety. The synthesis of these core perspectives contributes to a theoretical foundation for investigating the pedagogical role of AI conversational agents in relation to speaking anxiety. Following Krashen's Input Hypothesis, this framework emphasizes the significance of comprehensible input ( $i+1$ ) in second language acquisition. Krashen's Affective Filter Hypothesis further clarifies that heightened anxiety, such as low motivation and negative emotion, increases the affective filter, which blocks language input processing and limits output performance. Similarly, this study aligns with Merrill Swain's Output Hypothesis as complementary to Stephen Krashen's Input Hypothesis, suggesting that learners cannot obtain a complete understanding of grammatical accuracy merely through input processing in a language. Swain's Output Hypothesis helps explain the role of language production in developing learners' linguistic competence. From this perspective, lower speaking anxiety may facilitate effective language learning and oral fluency development. AI conversational agents can lower the affective filter, ensuring a safe, non-judgmental environment for consistent

exposure to input and practice. The behaviorist perspective emphasizes habit formation in language learning. From a behaviorist perspective, errors may be viewed as undesirable habits that can be addressed through feedback and repetition. Positive reinforcement, including encouragement and corrective feedback, may support language production. Additionally, the researchers followed the concept of Communicative Language Teaching (CLT), which offers an instructional foundation focusing on effective and meaningful communication instead of error-free grammatical accuracy. Errors are accepted unless they hinder successful communication, and judicious corrective feedback is provided to maintain speech flow. Because excessive corrective feedback and intensive attention to grammatical accuracy may interrupt fluency and increase stress, this approach may be relevant to addressing speaking anxiety. Sociocultural theory (Vygotsky, 1978) provides a framework for understanding interaction in which AI conversational agents may support opportunities for negotiation of meaning, learner engagement, and language development.

## Methodology

### Research Design

A mixed-methods convergent design was employed, incorporating three independent but complementary data strands: student questionnaire data, pre- and post-intervention speaking-performance assessments, and teacher interview data. The three strands were analyzed independently and integrated at the interpretation stage to provide complementary evidence regarding learners' speaking development and speaking anxiety. The intervention component followed a one-group pre-intervention/post-intervention design, in which the same participants' speaking performance and observable manifestations of speaking anxiety were assessed before and after the intervention, without a control or comparison group. The baseline survey comprised a structured questionnaire administered to 151 first-year undergraduate students to collect baseline information regarding students' perceptions and experiences of AI assistance in English speaking practice, skill development, and changes in anxiety level. The intervention-related assessment included ten purposively selected first-year undergraduate students. This assessment provided statistical evidence of pre- to post-intervention change in speaking performance and observable manifestations of speaking anxiety. The researchers recorded the participants' speaking performance before and after the AI intervention. Two researchers independently evaluated the recorded performance using a predetermined five-point assessment rubric. They reviewed disagreements in scoring and subsequently reached dimension-level consensus scores. Teacher interviews were conducted to explore their perceptions and recommendations regarding the use of AI in students' English-speaking development and its potential role in relation to speaking anxiety. Addressing the research questions, this study subsequently assessed and interpreted the quantitative pre- and post-intervention scores and qualitative findings.

### Participants and Sampling

The study involved 151 first-year undergraduate students, including a purposively selected subgroup of ten students who participated in the intervention, and five university English teachers.

### *Selecting Student Participants*

Members of the research team approached the 151 student participants from three disciplines (English, Marketing, and Anthropology) through their English classes. Participation was completely voluntary. Before administering the questionnaire, the research team verbally explained the purpose and nature of the study and obtained participants' consent. The research team also obtained written consent through the consent form attached to the questionnaire. The students were purposively selected because they had recently completed or were attending foundation English courses as part of their first-year curriculum, which included English speaking and listening components. Their prior exposure to digital technologies and AI, as well as their willingness and readiness to participate, was also considered in the selection.

After administering the baseline questionnaire, ten students were purposively selected from the 151 participants for the pre- and post-intervention assessment. Their selection was based on classroom-performance observations, particularly observable manifestations of speaking difficulty and anxiety, as well as their motivation to develop English-speaking competence and willingness to participate consistently in the speaking activities. The ten selected students were from one department and provided additional consent for recording their pre- and post-intervention speaking performances. They were assigned anonymous identifiers (P1–P10) to maintain confidentiality.

### *Selecting Teacher Participants*

Five English language teachers from public and private universities, who taught English speaking- and listening-related courses, participated in semi-structured interviews. The teachers were purposively selected based on their relevant teaching content, professional background, and suitability for the study's sample criteria. They were personally invited to participate, and informed consent was obtained before the interviews. The participating teachers represented both public and private universities in Bangladesh and varied in gender, age, teaching experience, and educational qualifications. Their interviews were conducted independently of the student questionnaire and pre- and post-intervention data.

### *Intervention Protocol*

The intervention protocol study was divided into three phases: the Pre-intervention assessment phase, the AI-supported intervention phase, and the post-intervention assessment phase. Table 4.1 provides a summary of the intervention process:

**Table 1:** Intervention Protocol Phases

| Phase                     | Main Procedure                                                       | Participants | Duration                                                           |
|---------------------------|----------------------------------------------------------------------|--------------|--------------------------------------------------------------------|
| Phase I: Pre-intervention | Baseline speaking performance, recorded by the researchers           | 10           | 7-8 minutes per participant                                        |
| Phase II: Intervention    | 16 AI-assisted speaking practice sessions, guided by the researchers | 10           | 40-50 minutes per session, total approximately 12 hours in 5 weeks |

|                              |                                                          |    |                             |
|------------------------------|----------------------------------------------------------|----|-----------------------------|
| Phase III: Post-intervention | Speaking assessment and recording after the intervention | 10 | 7-8 minutes per participant |
|------------------------------|----------------------------------------------------------|----|-----------------------------|

At the pre-intervention stage, the ten selected participants were observed in baseline speaking tasks focusing on four areas: classroom performance, self-introductions, forming questions, and pronunciation activities. The researchers recorded their performance to assess and score them according to a predetermined five-dimensional rubric (See section 4.5) at both pre- and post-intervention levels. The recordings became the data source for the participants' observable behavior demonstrating speaking anxiety at the two assessment stages.

The AI intervention was designed to provide the selected participants with structured, AI-assisted conversational practice opportunities for English-speaking development. The intervention was executed over five weeks and comprised 16 sessions. Each session lasted approximately 40–50 minutes, and in total, it took approximately 12 hours of intervention time. ChatGPT, Microsoft Copilot, and Google Gemini were the three AI conversational tools that this intervention used as supplementary resources for guided speaking practice. The intervention focused on four speaking-task areas—classroom performance, self-introduction, question formation, and pronunciation drills. Each task area was assigned four sessions.

### ***Researcher Instruction and Demonstration***

At the beginning of each session, there were 8–10 minutes of researcher-led instruction and demonstration. It introduced the assigned speaking task, clarified the objectives and procedures, demonstrated how to perform the task, and guided the participants on how to use the selected AI conversational agents for the activity. For example, the researchers showed how to prompt the AI for assistance with impromptu speech, self-introduction, question formation, or pronunciation practice depending on the activity chosen for that particular session.

### ***Individual AI-assisted Speaking Practice***

The next part of each session included approximately 10–15 minutes of individual AI-assisted practice. At this stage, participants were involved in repeated and personalized speaking practice with AI assistance. Participants had the opportunity to interact with ChatGPT, Microsoft Copilot, or Google Gemini individually. They followed the task and instructions provided by the researchers. Depending on the speaking focus, the nature of the interaction varied.

### ***Pair and Group Practice***

Pair and group practice involved approximately 5–10 minutes of collaborative practice following the AI interaction. Participants practiced the assigned speaking tasks using AI-generated prompts.

### *Feedback, Revision, and Repetition*

The researchers provided opportunities for participants to receive feedback both from the researchers and AI for approximately 5–7 minutes in each session. Participants also revised and repeated their responses.

### *Reflection and Preparation for Home Practice*

The researchers reviewed participants' performance and difficulties and provided further guidance where necessary. They guided the participants to continue practicing the related speaking activities at home. This final stage occupied approximately 4–5 minutes of each session.

### *Intervention Task Areas*

**Table 2:** Sessions Equally Distributed across Four Speaking-task Areas

| Speaking-task area    | Number of sessions | Main focus                                          |
|-----------------------|--------------------|-----------------------------------------------------|
| Classroom performance | 4                  | How to perform impromptu speech in speaking classes |
| Self-introduction     | 4                  | How to organize and deliver a self-introduction     |
| Question formation    | 4                  | How to format grammatically appropriate questions   |
| Pronunciation drills  | 4                  | How to pronounce a list of selected English words   |
| <b>Total</b>          | <b>16</b>          | <b>Approximately 12 hours</b>                       |

The same four broad areas were assessed in the pre- and post-intervention speaking activities. Although the same speaking domains were assessed at both stages, the tasks and prompts varied, so participants could not simply memorize them.

### *Data Collection*

#### *Questionnaire*

A structured questionnaire comprising both closed- and open-ended items was administered. It comprised five sections. The initial section recorded demographic information such as department, medium of instruction, and involvement with English-speaking and listening courses, and the second section examined the patterns of AI conversational agent use, including frequency of use, preferred platforms, and speaking-related activities. The third section investigated self-reported levels of English-speaking anxiety before and after AI use, while the fourth assessed perceived advantages, challenges, and suggestions regarding AI-integrated speaking practice. Additionally, the final section adopted a five-point Likert scale to assess learners' perceptions of the effect of AI conversational agents in relation to fluency, pronunciation, grammatical accuracy, vocabulary development, confidence, and anxiety reduction. In an open-ended question in the concluding part, researchers collected learners' perspectives on how AI will be more practically applicable in English language learning.

### ***One-Group Pre- and Post-intervention Recorded Performance***

The audio and video recordings of the ten selected participants served as important sources for quantitative and qualitative data analysis. The participants' pre-intervention and post-intervention speaking performance was recorded by the researchers and evaluated through a predetermined assessment rubric. The researchers analyzed and reanalyzed the recorded speaking performance in four broad areas (See section 4.3) and scored at the dimension level (See section 4.5) at both assessment phases to focus on baseline speaking performance and any changes identified in post-intervention speaking performance. During these pre- and post-intervention phases, classroom observations were also carried out. The researchers observed and recorded the selected participants' class performance in ongoing English language course classes where the participants participated in impromptu speech sessions conducted by the course teacher. Observation notes were taken.

### ***Teacher Interviews***

Teacher interviews were the third data set for this study's data collection and were not connected to the recorded performance of the participants. These semi-structured interviews concentrated on teachers' experiences and perspectives regarding learners' speaking anxiety, the instructional value of AI conversational agents, and the advantages and disadvantages of using AI agents in English language teaching.

### ***Instrument and Assessment Rubric***

This study used four main data-collection instruments: students' questionnaires at the pre-intervention stage (explained in section 4.4.1), pre- and post-intervention speaking performance recordings of the participants (section 4.4.2), teachers' semi-structured interview protocol recordings and transcripts (section 4.4.3), and a five-dimension predetermined assessment rubric.

The researchers developed a predetermined assessment rubric and applied it retrospectively to the pre-and post-intervention speaking performance recordings. After the original observation process, this numerical analytic rubric was used for retrospective operationalization of the predetermined assessment criteria for the archived data.

No standardized anxiety scale was used. Instead, observable manifestations of speaking anxiety were assessed using a researcher-developed five-point observational dimension within the speaking-performance rubric. This dimension focused on observable behavioural manifestations of anxiety during speaking tasks rather than participants' self-reported psychological anxiety.

**Table 3:** Five-Dimension Speaking Performance and Observable Anxiety Rubric

| Dimension                   | 1 = Very Low                                                                                                              | 2 = Low                                                                                                                 | 3 = Moderate                                                                                                            | 4 = Good                                                                                                    | 5 = Very Good                                                                                                        |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>Grammatical Accuracy</b> | Recurrent grammatical errors significantly affect meaning; fundamental sentence structures are often incorrect.           | Recurrent errors in sentence building, tense, arrangement, articles, etc.; meaning is sometimes impacted.               | Some grammatical errors happen, but general meaning remains strong; fundamental structures are generally maintained.    | Usually correct grammatical use with infrequent minor errors that hardly impact meaning.                    | Steadily correct use of grammatical forms; errors are rare and do not impact communication.                          |
| <b>Pronunciation</b>        | Recurrent pronunciation difficulties make speech problematic to comprehend; some words/sounds are consistently difficult. | Pronunciation problems are common and sometimes affect intelligibility.                                                 | Usually intelligible, although several pronunciation difficulties occur occasionally. Mispronunciations are noticeable. | Mostly clear and correct pronunciation; minor difficulties rarely affect intelligibility.                   | Strong, consistent, and easily comprehensible pronunciation with very few or no obvious problems.                    |
| <b>Fluency or Hesitancy</b> | Extremely hesitant speech, fragmented, and characterized by recurrent long pauses, repetitions, or self-interruptions.    | Recurrent hesitation and pauses; speech is often interrupted, although the participant can express fundamental meaning. | Modest fluency; apparent pauses and hesitation happen, but communication can usually be continued.                      | Usually fluent speech with infrequent hesitation or pauses; ideas are articulated with coherent steadiness. | Smooth and continuous speech with negligible hesitation, few unnecessary pauses, and noticeable continuity of ideas. |

|                                                      |                                                                                                                                                                    |                                                                                                     |                                                                                                                   |                                                                                                                     |                                                                                                                                 |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Confidence or Comfort</b>                         | Demonstrates extreme discomfort, unwilling to speak; very low confidence; recurrently avoids or reduces responses.                                                 | Demonstrates obvious discomfort and low confidence; needs significant encouragement or reassurance. | Demonstrates reasonable ease and confidence; replies with occasional hesitation or requires occasional prompting. | Demonstrates comfort and noticeable confidence; responds willingly and continues interaction with little prompting. | Demonstrates significant comfort and confidence; speaks willingly, responds spontaneously, and continues interaction naturally. |
| <b>Observable Manifestations of Speaking Anxiety</b> | Significant and recurrent noticeable signs of anxiety, such as marked hesitation, avoidance, visible nervous behaviour, very low voice, or unwillingness to reply. | Several visible signs of anxiety occur frequently and impact speaking performance.                  | Some visible anxious behaviours happen, but they do not significantly restrict participation or communication.    | Few visible anxious behaviours; participant usually maintains composure and participates comfortably.               | Few or no visible signs of anxiety; participant appears relaxed, composed, and ready to communicate.                            |

Scoring convention: 1 = Very Low and 5 = Very Good. Higher scores indicate better speaking performance and greater confidence/comfort or lower observable anxiety. The rubric provided a basis for quantitatively evaluating changes in participants' speaking performance and observable manifestations of speaking anxiety.

### Rater Assessment and Consensus Procedure

This study had two independent raters from this research team to score the recorded speaking performance of the ten participants. The raters did not assign scores during the original observation of the actual performance. Retrospectively, the raters analyzed and reanalyzed the recordings of the selected participants. The raters applied the predetermined five-dimensional rubric (Section 4.5), and disagreements occurred at the dimension level. They subsequently reanalyzed the recordings and established consensus scores for each dimension. For the first four dimensions, scores were summed to produce a total score ranging from 4 to 20. Lower scores here indicated grammatical errors, pronunciation difficulties, greater hesitancy in speaking, and less confidence and comfort. Conversely, a higher score reflected better grammatical accuracy, better pronunciation, greater fluency, and stronger confidence and comfort. For observable manifestations of anxiety, a separate anxiety score from 1–5 was finalized by consensus for each pre- and post-intervention performance of the participants, where a lower score

indicated higher anxiety and a higher score indicated fewer observable manifestations of anxiety.

## **Analytical Methods**

### ***Quantitative Data Analysis***

The student questionnaire administered at the pre-intervention level provided data on AI conversational agent use and learners' perceptions of its relationship to English-speaking anxiety. The quantitative analysis included frequency and percentage analysis of the respondents' information. The pre- and post-intervention assessment phases generated numerical data from the two raters' assessments. The discrepancies between the two raters' scores at the dimension level were analyzed, and an adjudicated consensus score was finalized. Based on the consensus scores, the mean score, standard deviation, and mean change were calculated. Because the intervention involved a single group of ten participants assessed before and after the intervention, the statistical results were interpreted as evidence of within-participant pre/post change rather than evidence of causal effects relative to a control group. To check the statistical significance of pre- and post-intervention scores, a Wilcoxon signed-rank test was applied because the sample was small and the rubric-based scores were ordinal. The test was used to assess whether the observed pre- to post-intervention differences were statistically significant, with effect size calculated to estimate the magnitude of change. These analyses quantified the observed pre- to post-intervention changes. AI-assisted tools were used to support the statistical calculation, checking, and the organization of the results into tables. All AI-assisted calculations were checked against the original dataset by the researchers, who retained responsibility for the final statistical analysis and interpretation.

### ***Qualitative Data Analysis***

The qualitative analysis involved interview transcription, coding, categorization, development of themes and subthemes, selection of illustrative quotations, and thematic interpretation of the teacher interviews. The researchers recorded the teacher interviews with the participant teachers' consent. The teachers were identified with pseudonyms (T1, T2, T3, T4, and T5) to preserve the confidentiality of their identities. In the research, no personally identifiable information of the teachers was used. The researchers manually transcribed the audio recordings and repeatedly read the transcripts to gain an overall understanding of the accounts. Relevant sections of the transcripts were then identified, and initial codes were assigned that reflected significant features of teachers' perceptions and experiences. Then the initial codes were grouped according to conceptual similarities. This led to the development of broader categories and potential subthemes. Related subthemes were then assessed and organized into principal themes that represented recurring patterns across the interview data. The evolving themes were assessed against the original replies and revised through discussion among the researchers. Illustrative quotations were selected to demonstrate the identified themes. Integration did not mean statistical combination of the data sets; rather, the data from the three strands were reviewed together in relation to the research questions.

### ***Integration of Findings***

The three data strands—student questionnaire, pre-/post-intervention performance assessment, and teacher interviews—were treated as independent but complementary sources of evidence. To focus on the areas of convergence, complementarity, and divergence across the data sources, the findings were compared and interpreted in relation to the research questions. Convergent evidence implied a similar direction in the findings from different sources. Complementary evidence provides additional information or explanation that enriches findings from another data source. Any differences across the findings were also examined and, if found, noted as areas of divergence.

### **Ethical Considerations**

All participants participated voluntarily; they were aware of the recordings for data collection, and informed consent was obtained from all participants before data collection began. The participants were made aware of the purpose of the study and their right to withdraw at any stage without penalty. Data confidentiality and participant anonymity were a priority. Participants' identities were not disclosed in the manuscript. The questionnaire, recorded speaking performances, classroom observations, and teacher interviews were analyzed using the quantitative and qualitative procedures described above. Data confidentiality and participant anonymity were ensured throughout the research process. Audio and video recordings were securely stored and used solely for research purposes. Only the members of the research team had the authority to access all stored research data from this study. Subsequent reanalysis of the recorded data was also conducted within the scope of the original consent of the participants.

### **Declaration of Generative AI and AI-Assisted Technologies**

During the preparation of this manuscript, the authors used ChatGPT and Microsoft Copilot for selected research-support and manuscript-preparation tasks, including assistance with statistical calculations/checking, generation of diagrams and infographic images, and language and editorial improvement. All data, statistical results, interpretations, and final manuscript content were reviewed and verified by the authors, who retain full responsibility for the authenticity, accuracy, and integrity of the work.

## **Data Analysis and Findings**

### **Questionnaire**

To obtain an overview of the participants' experiences, this study used a Likert scale questionnaire, divided into 4 major sections:

- a. Usage patterns of AI conversational agents,
- b. Speaking anxiety in a university context
- c. Perceived benefits and suggestions
- d. Perceived impact on English speaking skills

**Table 4:** Frequency of AI Conversational Agent Use

| Category                                     | Findings                                                   | Percentage |
|----------------------------------------------|------------------------------------------------------------|------------|
| Frequency of AI use                          | Sometimes use AI agents                                    | 51.66%     |
|                                              | Habitual use                                               | 19.07%     |
|                                              | General use                                                | 21%        |
|                                              | Minimal connection                                         | 4.64%      |
|                                              | Rarely use                                                 | 3.63%      |
|                                              | Overall AI use                                             | 91.73%     |
| Preferred platforms                          | General chatbots (ChatGPT, Copilot)                        | 88.08%     |
|                                              | Dedicated language apps (Duolingo Max, ELSA Speak, Babbel) | 11.92%     |
| Practice frequency                           | Several times a week                                       | 38.84%     |
|                                              | Daily practice                                             | 22%        |
|                                              | A few times a month                                        | 15.72%     |
|                                              | Once a week                                                | 15.44%     |
|                                              | Rarely practice                                            | 8%         |
| Activities practiced                         | Vocabulary improvement                                     | 21.11%     |
|                                              | English listening                                          | 16%        |
|                                              | All listed activities                                      | 15.8%      |
| Self-reported speaking anxiety before AI use | Moderate anxiety                                           | 50%        |
|                                              | High anxiety                                               | 27.03%     |
|                                              | Very high anxiety                                          | 16.22%     |
|                                              | Low anxiety                                                | 4%         |
|                                              | Very low anxiety                                           | 2.75%      |
| Speaking anxiety (after AI)                  | Moderate anxiety                                           | 40%        |
|                                              | High anxiety                                               | 14.29%     |
|                                              | Very high anxiety                                          | 4.08%      |
|                                              | Low anxiety                                                | 27.21%     |

|                                                                         |                                                       |               |
|-------------------------------------------------------------------------|-------------------------------------------------------|---------------|
|                                                                         | Very low anxiety                                      | 14.42%        |
| Perceived benefits                                                      | AI helps manage classroom anxiety (Agree)             | 50.03%        |
|                                                                         | Strongly agree                                        | 7.76%         |
|                                                                         | Neutral                                               | 38.51%        |
|                                                                         | Disagree                                              | 3.7%          |
|                                                                         | Total percentage of agree and disagree respondents    | 57.79%        |
| Advantages of AI learning<br>(Participants 151, total responses n= 293) | New phrases & pronunciation correction                | 17.23%        |
|                                                                         | Confidence growth                                     | 30.5%         |
|                                                                         | Reduced fear/anxiety                                  | 30.42%        |
|                                                                         | Convenience of practicing speaking (anytime/anywhere) | 5.5%          |
|                                                                         | Instant feedback convenience                          | 6.79%         |
|                                                                         | All of the above                                      | 9.56%         |
| Challenges<br>N= 199                                                    | Lack of guidance                                      | 32.16%        |
|                                                                         | Low knowledge of AI use                               | 24.15%        |
|                                                                         | Insufficient motivation                               | 30.12%        |
|                                                                         | <i>Poor internet access (rural learners)</i>          | <i>13.57%</i> |

Figure 2 summarizes the questionnaire findings on students' use of AI conversational agents for English language learning.

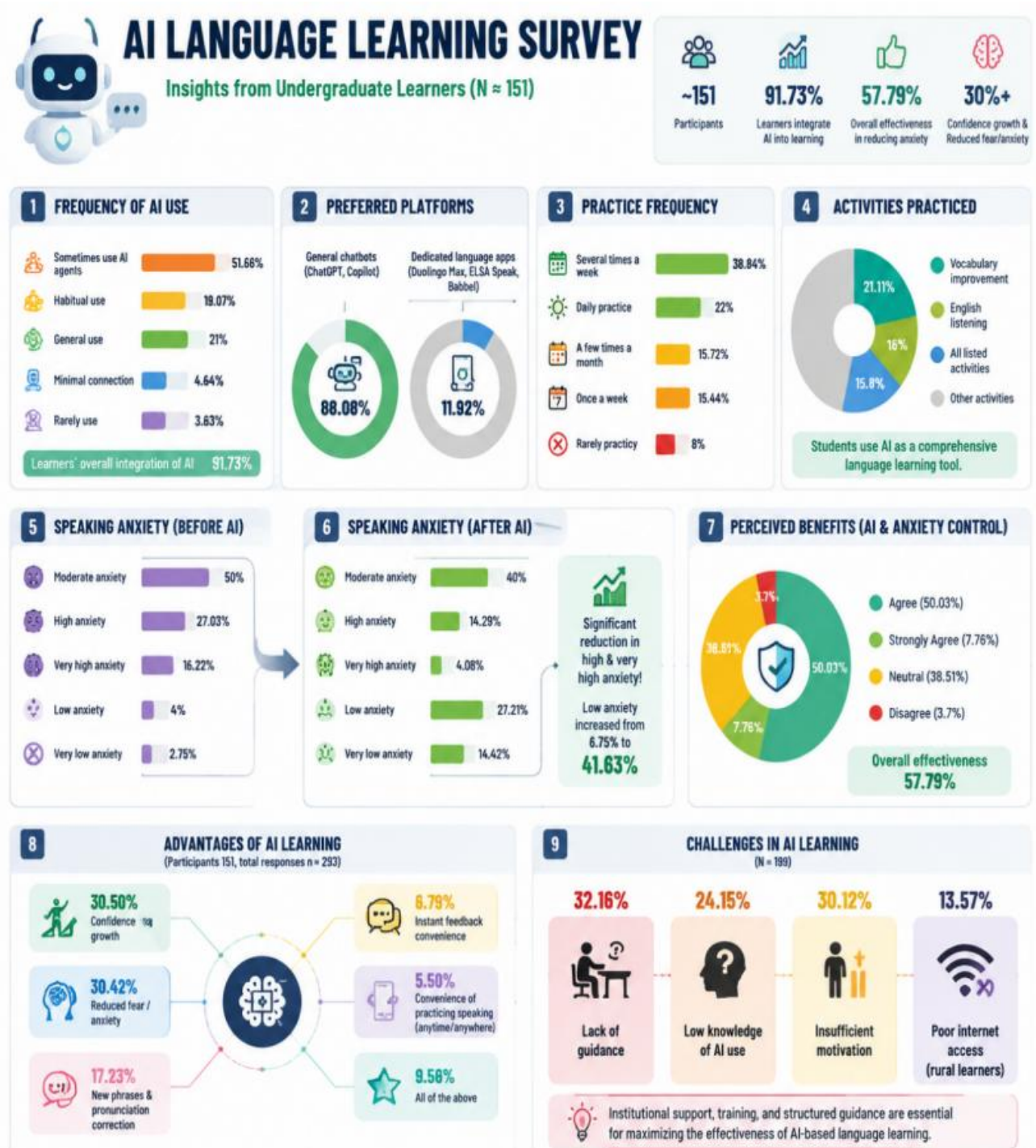


Figure 2: Summary of the Percentage of AI Integration  
(AI-supported infographic image)

**Table 5:** Likert-Scale Questionnaire on Students' Perceived Impact of AI on English Speaking Skills

| Statement on AI                                   | Findings          | Percentage |
|---------------------------------------------------|-------------------|------------|
| A. Improved fluency<br>N= 151                     | Agree             | 51.03%     |
|                                                   | Strongly Agree    | 10.7%      |
|                                                   | Neutral           | 32.36%     |
|                                                   | Disagree          | 3.52%      |
|                                                   | Strongly disagree | 2.39%      |
| B. Improved pronunciation<br>N= 148               | Agree             | 60.14%     |
|                                                   | Strongly Agree    | 15.81%     |
|                                                   | Neutral           | 20.05%     |
|                                                   | Disagree          | 2.3%       |
|                                                   | Strongly Disagree | 1.7%       |
| C. Improved grammatical<br>accuracy<br>N=145      | Agree             | 52.35%     |
|                                                   | Strongly Agree    | 15.8%      |
|                                                   | Neutral           | 26.8%      |
|                                                   | Disagree          | 4.5%       |
|                                                   | Strongly disagree | 0.55%      |
| D. Improved vocabulary for<br>spoken<br>N= 151    | Agree             | 50.99%     |
|                                                   | Strongly agree    | 16.9%      |
|                                                   | Neutral           | 24.17%     |
|                                                   | Disagree          | 5.6%       |
|                                                   | Strongly disagree | 2.34%      |
| E. Ensured judgement-free<br>environment<br>N=149 | Agree             | 49.64%     |
|                                                   | Strongly agree    | 21.48%     |
|                                                   | Neutral           | 22.83%     |
|                                                   | Disagree          | 3.7%       |
|                                                   | Strongly disagree | 2.34%      |
| F. Improved confidence<br>N=150                   | Agree             | 42.55%     |
|                                                   | Strongly agree    | 13.56%     |
|                                                   | Neutral           | 38.07%     |
|                                                   | Disagree          | 4.67%      |
|                                                   | Strongly Disagree | 1.15%      |

The following infographic visually highlights the findings of the Likert scale questionnaire on students' perceived impact of AI conversational agents.

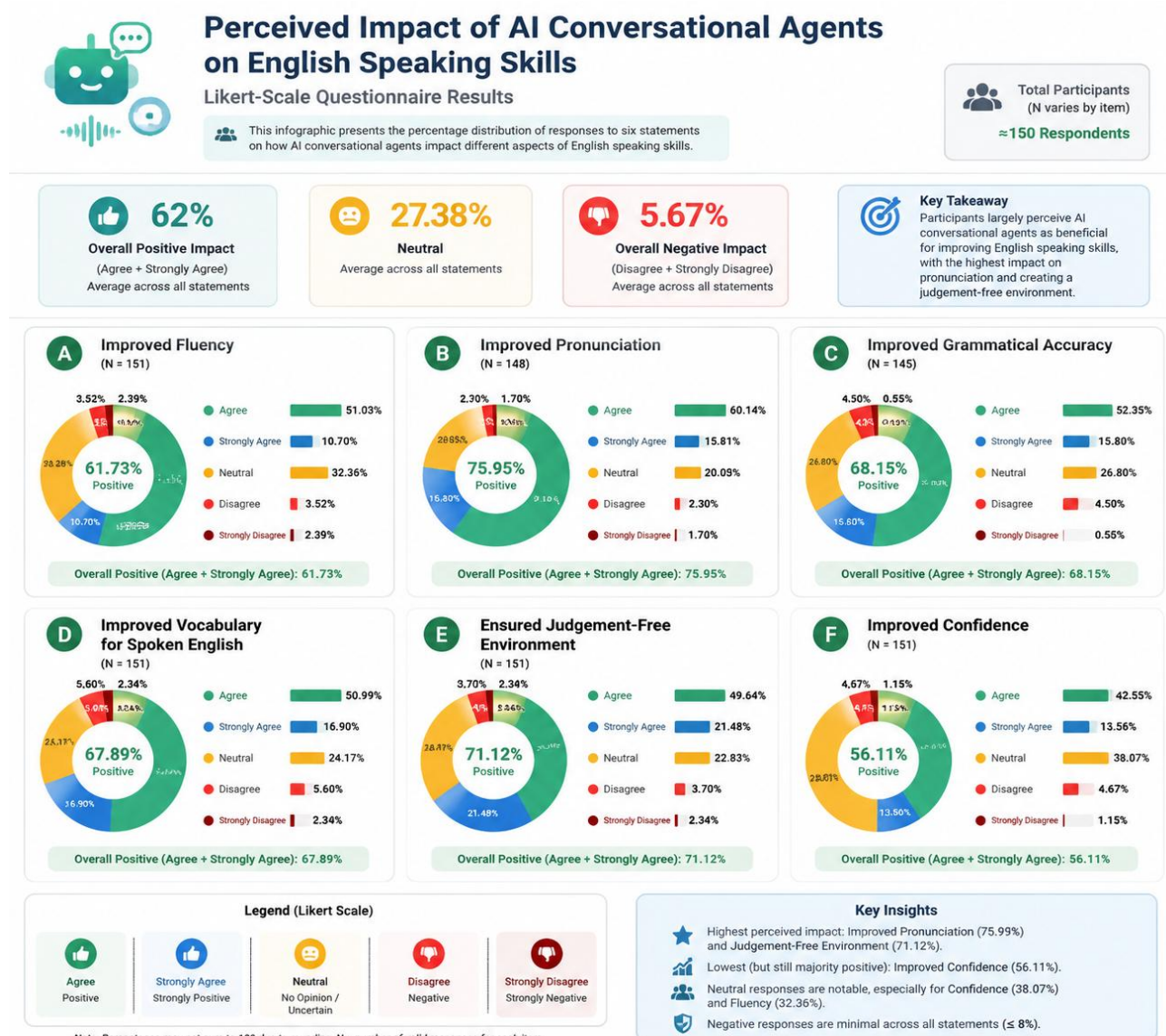


Figure 3: Students' Perceived Impact of AI Conversational Agents on English Speaking Skills  
(AI-supported infographic image)

In the open-ended section, the most frequent recommendation was that AI-supported activities should be introduced with appropriate teacher guidance and institutional policies. Participants also suggested encouraging responsible AI use through clear guidelines and seminars or workshops on AI integration in learning.

### Pre- and Post-intervention Performance Assessment and Scores

The following table shows the two raters' initial and consensus scoring for each dimension after evaluating the speaking performance recordings of the participants at the pre-intervention phase. The data analysis provides the consensus total scores for each participant's speaking performance and confidence.

## Pre-intervention Score

**Table 6:** Pre-intervention Score (Individual & Consensus scoring of Rater 1 & 2)

| Participants | Grammatical Accuracy (1-5) |    |           | Pronunciation (1-5) |    |           | Fluency/ Hesitancy (1-5) |    |           | Confidence/ Comfort (1-5) |    |           | Speaking Performance & Confidence Total Consensus Score (4-20) |
|--------------|----------------------------|----|-----------|---------------------|----|-----------|--------------------------|----|-----------|---------------------------|----|-----------|----------------------------------------------------------------|
|              | R1                         | R2 | Consensus | R1                  | R2 | Consensus | R1                       | R2 | Consensus | R1                        | R2 | Consensus |                                                                |
| <b>P1</b>    | 2                          | 2  | 2         | 3                   | 3  | 3         | 1                        | 2  | 2         | 3                         | 1  | 2         | 9                                                              |
| <b>P2</b>    | 1                          | 2  | 2         | 2                   | 1  | 1         | 1                        | 1  | 2         | 1                         | 1  | 1         | 6                                                              |
| <b>P3</b>    | 2                          | 2  | 2         | 1                   | 1  | 1         | 2                        | 2  | 2         | 2                         | 1  | 1         | 6                                                              |
| <b>P4</b>    | 1                          | 1  | 1         | 1                   | 1  | 1         | 1                        | 1  | 1         | 1                         | 1  | 1         | 4                                                              |
| <b>P5</b>    | 3                          | 3  | 3         | 3                   | 3  | 3         | 2                        | 3  | 3         | 2                         | 2  | 2         | 11                                                             |
| <b>P6</b>    | 2                          | 2  | 2         | 1                   | 1  | 1         | 1                        | 2  | 1         | 2                         | 2  | 2         | 6                                                              |
| <b>P7</b>    | 3                          | 3  | 3         | 2                   | 1  | 2         | 1                        | 2  | 2         | 2                         | 2  | 2         | 9                                                              |
| <b>P8</b>    | 2                          | 2  | 2         | 1                   | 1  | 1         | 1                        | 2  | 2         | 1                         | 1  | 1         | 6                                                              |
| <b>P9</b>    | 2                          | 2  | 2         | 2                   | 2  | 2         | 1                        | 1  | 1         | 2                         | 2  | 2         | 7                                                              |
| <b>P10</b>   | 2                          | 2  | 2         | 1                   | 2  | 2         | 1                        | 1  | 1         | 2                         | 2  | 2         | 7                                                              |

Interpretation of each dimension score:

1 = recurrent grammatical errors, noticeable pronunciation difficulties, or high hesitancy;  
5 = few or no observable grammatical or pronunciation difficulties and little or no fluency problem.

A higher score therefore indicates fewer observable errors and difficulties.

The next table shows the consensus scoring by the two raters for observable manifestations of speaking anxiety among the participants in the pre-intervention phase.

**Table 7:** Observable Manifestation of Speaking Anxiety Score (Pre-Intervention)

|           | R1 | R2 | Consensus |
|-----------|----|----|-----------|
| <b>P1</b> | 3  | 2  | 2         |
| <b>P2</b> | 2  | 1  | 1         |
| <b>P3</b> | 1  | 2  | 1         |
| <b>P4</b> | 2  | 1  | 1         |
| <b>P5</b> | 3  | 3  | 3         |
| <b>P6</b> | 2  | 1  | 1         |
| <b>P7</b> | 2  | 2  | 2         |
| <b>P8</b> | 1  | 1  | 1         |

|            |   |   |   |
|------------|---|---|---|
| <b>P9</b>  | 2 | 1 | 2 |
| <b>P10</b> | 2 | 2 | 2 |

Interpretation of Observable Anxiety: 1 = strong/frequent observable anxiety; 5 = little or no observable anxiety. A higher score therefore specifies fewer noticeable observable manifestations of speaking anxiety.

The next two tables show the two raters' initial scoring and then the consensus score for each of the four dimensions in Table 5.4, and the score for observable manifestations of anxiety separately in Table 5.5 for the post-intervention assessment phase. The score range (1-5) in both tables will follow the same interpretations as stated for the pre-intervention phase since the raters used the same predetermined rubric for both assessment stages.

### Post-intervention Score

**Table 8:** Post-intervention Score (Individual & Consensus scoring of Rater 1 & 2)

| Participants | Grammatical Accuracy (1-5) |    | Pronunciation (1-5) |    | Fluency/Hesitancy (1-5) |    | Confidence/Comfort (1-5) |    | Speaking Performance & Confidence Total Consensus Score (4-20) |
|--------------|----------------------------|----|---------------------|----|-------------------------|----|--------------------------|----|----------------------------------------------------------------|
|              | R1                         | R2 | R1                  | R2 | R1                      | R2 | R1                       | R2 |                                                                |
|              | Consensus                  |    | Consensus           |    | Consensus               |    | Consensus                |    |                                                                |
| <b>P1</b>    | 4                          | 4  | 5                   | 5  | 5                       | 3  | 5                        | 4  | 16                                                             |
| <b>P2</b>    | 3                          | 4  | 4                   | 3  | 4                       | 4  | 5                        | 4  | 14                                                             |
| <b>P3</b>    | 5                          | 4  | 4                   | 3  | 4                       | 4  | 4                        | 3  | 14                                                             |
| <b>P4</b>    | 4                          | 3  | 3                   | 3  | 3                       | 4  | 4                        | 4  | 13                                                             |
| <b>P5</b>    | 5                          | 5  | 4                   | 4  | 4                       | 5  | 5                        | 5  | 18                                                             |
| <b>P6</b>    | 3                          | 3  | 4                   | 3  | 3                       | 4  | 5                        | 4  | 13                                                             |
| <b>P7</b>    | 4                          | 5  | 4                   | 3  | 4                       | 4  | 4                        | 4  | 15                                                             |
| <b>P8</b>    | 4                          | 4  | 3                   | 2  | 4                       | 3  | 4                        | 4  | 13                                                             |
| <b>P9</b>    | 3                          | 4  | 3                   | 3  | 3                       | 4  | 5                        | 3  | 12                                                             |
| <b>P10</b>   | 4                          | 5  | 3                   | 4  | 5                       | 5  | 5                        | 4  | 16                                                             |

**Table 9:** Post-intervention Score for Observable Manifestation of Speaking Anxiety

| Participants | Observable Manifestation of Speaking Anxiety (1-5) |    | Participants | Observable Manifestation of Speaking Anxiety (1-5) |    |
|--------------|----------------------------------------------------|----|--------------|----------------------------------------------------|----|
|              | R1                                                 | R2 |              | R1                                                 | R2 |
|              | Consensus                                          |    |              | Consensus                                          |    |
| <b>P1</b>    | 5                                                  | 5  | <b>P6</b>    | 4                                                  | 4  |
|              | 4                                                  |    |              | 3                                                  |    |
| <b>P2</b>    | 3                                                  | 4  | <b>P7</b>    | 4                                                  | 4  |
|              | 3                                                  |    |              | 4                                                  |    |
| <b>P3</b>    | 4                                                  | 4  | <b>P8</b>    | 3                                                  | 3  |
|              | 3                                                  |    |              | 3                                                  |    |
| <b>P4</b>    | 4                                                  | 3  | <b>P9</b>    | 3                                                  | 4  |
|              | 3                                                  |    |              | 3                                                  |    |
| <b>P5</b>    | 5                                                  | 5  | <b>P10</b>   | 3                                                  | 5  |
|              | 5                                                  |    |              | 4                                                  |    |

The following two tables analyze the consensus scores of the two raters and provide the mean scores for each of the five dimensions for all the participants in pre- and post-intervention assessment phases.

**Table 10:** Pre-intervention Consensus and Mean Scores

| Participant | Grammar     | Pronunciation | Fluency Or Hesitancy | Confidence Or Comfort | Speaking Performance & Confidence Total (4–20) | Observable Anxiety (1–5) |
|-------------|-------------|---------------|----------------------|-----------------------|------------------------------------------------|--------------------------|
| <b>P1</b>   | 2           | 3             | 2                    | 2                     | 9                                              | 2                        |
| <b>P2</b>   | 2           | 1             | 1                    | 1                     | 6                                              | 1                        |
| <b>P3</b>   | 2           | 1             | 2                    | 1                     | 6                                              | 1                        |
| <b>P4</b>   | 1           | 1             | 1                    | 1                     | 4                                              | 1                        |
| <b>P5</b>   | 3           | 3             | 3                    | 2                     | 11                                             | 3                        |
| <b>P6</b>   | 2           | 1             | 1                    | 2                     | 6                                              | 1                        |
| <b>P7</b>   | 3           | 2             | 2                    | 2                     | 9                                              | 2                        |
| <b>P8</b>   | 2           | 1             | 1                    | 1                     | 6                                              | 1                        |
| <b>P9</b>   | 2           | 2             | 1                    | 2                     | 7                                              | 2                        |
| <b>P10</b>  | 2           | 2             | 1                    | 2                     | 7                                              | 2                        |
| <b>Mean</b> | <b>2.10</b> | <b>1.70</b>   | <b>1.50</b>          | <b>1.60</b>           | <b>7.10</b>                                    | <b>1.60</b>              |

**Table 11:** Post-intervention Consensus and Mean Scores

| Participant | Grammar | Pronunciation | Fluency Or Hesitancy | Confidence Or Comfort | Speaking Performance & Confidence Total (4–20) | Observable Anxiety (1–5) |
|-------------|---------|---------------|----------------------|-----------------------|------------------------------------------------|--------------------------|
| P1          | 4       | 4             | 4                    | 4                     | 16                                             | 4                        |
| P2          | 3       | 3             | 4                    | 4                     | 14                                             | 3                        |
| P3          | 4       | 3             | 4                    | 3                     | 14                                             | 3                        |
| P4          | 3       | 3             | 3                    | 4                     | 13                                             | 3                        |
| P5          | 5       | 4             | 4                    | 5                     | 18                                             | 5                        |
| P6          | 3       | 3             | 3                    | 4                     | 13                                             | 3                        |
| P7          | 4       | 3             | 4                    | 4                     | 15                                             | 4                        |
| P8          | 4       | 2             | 3                    | 4                     | 13                                             | 3                        |
| P9          | 3       | 3             | 3                    | 3                     | 12                                             | 3                        |
| P10         | 4       | 3             | 5                    | 4                     | 16                                             | 4                        |
| Mean        | 3.70    | 3.10          | 3.70                 | 3.90                  | 14.40                                          | 3.50                     |

The analysis showed an increase in the mean Speaking Performance and Confidence score from 7.10 (SD = 2.02) before the intervention to 14.40 (SD = 1.84) after the intervention, representing a mean increase of 7.30 points. An exact Wilcoxon signed-rank test indicated a statistically significant pre- to post-intervention difference ( $W = 0$ ,  $p < .01$ ;  $r = .87$ ). Similarly, the mean observable-anxiety score increased from 1.60 (SD = 0.70) at pre-intervention to 3.50 (SD = 0.71) at post-intervention. Because higher scores indicate fewer observable manifestations of anxiety, this increase indicates a statistically significant pre- to post-intervention difference in the observed anxiety measure ( $W = 0$ ,  $p < .01$ ;  $r = .87$ ).

**Table 12:** Pre-/Post-Intervention Comparison and Statistical Results

| Result                                   | Pre-intervention Mean (SD) | Post-intervention Mean (SD) | Mean Change | Wilcoxon W | Exact p | Effect size r |
|------------------------------------------|----------------------------|-----------------------------|-------------|------------|---------|---------------|
| Speaking Performance & Confidence (4–20) | 7.10 (2.02)                | 14.40 (1.84)                | +7.30       | 0          | .001953 | 0.87          |
| Observable Anxiety (1–5)                 | 1.60 (0.70)                | 3.50 (0.71)                 | +1.90       | 0          | .001953 | 0.87          |

For both outcome measures, all ten participants showed positive pre- to post-intervention differences. The exact two-sided Wilcoxon signed-rank p-value was  $p = .001953$  ( $p < .01$ ). The exact p-value was chosen for stating significance. This is because

$n=10$  and a normal approximation with continuity correction was used for effect-size calculation.

### Teachers' Interviews

The final thematic structure from the teachers' interviews consisted of five main themes, their related subthemes, and illustrative codes along with representative quotations and analytic interpretation as presented in Table 11.

**Table 13:** Thematic Analysis of Teacher Interviews

| Theme                                     | Subtheme                                 | Illustrative Codes                                   | Representative Quotations                                                                          | Analytic Interpretation                                                                                                                                                                                                            |
|-------------------------------------------|------------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The challenge of English-speaking anxiety | Fear of mistakes and negative evaluation | Grammatical mistakes; disapproval; negative judgment | "Fear of making grammatical mistakes, fear of judgment, and shyness" (T1)                          | As an internal affective state, anxiety determines the behavioural manifestations                                                                                                                                                  |
|                                           | Low confidence, shyness and hesitation   |                                                      | "Students hesitate, speak in a low voice, mumble, and avoid eye contact" (T3)                      | Teachers identify anxiety as both psychological and behavioral, influencing speaking performance and classroom communication.                                                                                                      |
| AI as a supportive practice context       | Reduced fear of judgment                 | Non-judgmental practice; reduced criticism           | "Students practicing with AI do not experience the same concern about being judged by others" (T2) | AI changes the affective situations of exercise by altering instant human judgment, allowing practice with ease.                                                                                                                   |
|                                           | Recurrent and autonomous practice        | Repeated practice; practice anytime/anywhere         | "AI practice could alleviate concerns about grammatical errors, shyness and judgment" (T5)         | Teachers consider AI as generating a safe practice space where learners can shape confidence before classroom participation.                                                                                                       |
| Pedagogical availability of AI            | Instant feedback                         | Instant feedback; corrective support                 | "AI provides immediate feedback and personalized learning" (T2)                                    | AI extends practice beyond the classroom, provides immediate corrective feedback that complements teacher instruction. Teachers consider AI provides opportunities for repeated practice, helping to release the teachers' burden. |
|                                           | Modified and supplementary practice      | Individualized learning; practice outside classroom  | "AI allows additional practice outside the classroom and individualized support" (T4)              |                                                                                                                                                                                                                                    |

|                                              |                                       |                                                         |                                                                                     |                                                                                                             |
|----------------------------------------------|---------------------------------------|---------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Teacher mediation as a precondition          | Guided and supervised use             | teacher guidance; monitoring; supervision               | “AI use in the classroom should remain under teacher supervision and guidance” (T5) | AI is considered a mediated resource; effective use depends on appropriate teacher guidance and regulation. |
|                                              | Teacher knowledge and preparation     | training; implementation; teacher knowledge             | “Appropriate teacher knowledge, implementation and guidance are essential” (T1)     | Teachers emphasize that AI is not independent; its educational value depends on teacher proficiency.        |
| Circumstances for sustainable AI integration | Technological access                  | Internet; technology                                    | “Internet access and technological resources are necessary” (T3)                    | Positive observations are conditional; incorporation relies on a supporting system.                         |
|                                              | Institutional and pedagogical support | Administrative support; curriculum alignment; resources | “Administrative support, curriculum alignment, and cost considerations matter” (T4) | Teachers highlight that sustainability requires institutional preparedness                                  |

The teachers’ interviews reveal the following insight:

- If teachers provide clear guidance on AI speaking tools, first-year undergraduate students may be encouraged to manage their anxiety in English-speaking.
- By guiding students to practice with AI agents, students can be motivated to develop their oral proficiency by overcoming reluctance to participate in speaking activities.
- Course content should be appropriately aligned with teachers’ knowledge and preparation.
- Successful implementation would be possible if the teacher's interest and administrative support are available.
- Providing adequate internet access and establishing clear guidelines for utilizing AI agents in course content may contribute to a lower-pressure environment for English-speaking practice.
- Using AI conversational agents is very simple for students’ English-speaking practice in this age of technology, as generally, they have access to the internet both at home and on campus.
- AI conversational agents should not replace teacher-led instruction but can complement it by supporting pronunciation practice, personalized learning, and immediate feedback. This is possible if teachers have the proper understanding of applying those tools in their teaching,
- Teachers perceived AI conversational agents as offering personalized, relatively low-pressure speaking practice that could supplement classroom instruction and potentially support learners’ confidence and fluency.
- With increasing digital access and teacher support, AI has the potential to become an integral tool in speaking courses, enabling students to overcome anxiety and actively engage in oral communication.

## Discussion

### Integrated Findings

The three integrated findings from the three complementary strands can be represented in the following joint display:

**Table 14:** Integrated Findings across the Three Complementary Data Strands

| Research area            | 151-student questionnaire                                                                                                                                                                                                                                    | 10-participant pre/post performance assessment                                                                                                                                                                         | Teacher interviews                                                                                                                                                                                                                                                 | Integrated interpretation                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| English Speaking Anxiety | Before AI use, 50% reported moderate anxiety, 27.03% high anxiety, and 16.22% very high anxiety. After AI use, high anxiety decreased to 14.29% and very high anxiety to 4.08%, while low and very low anxiety increased to 27.21% and 14.42%, respectively. | Mean observable-anxiety score increased from 1.60 at pre-intervention to 3.50 post-intervention. Because higher scores indicate fewer observable manifestations of anxiety, this represents a substantial improvement. | Teachers described fear of mistakes, negative evaluation, lack of confidence, hesitation, and shyness as common sources/signs of speaking anxiety. They also perceived AI as potentially providing a less judgmental environment for practice.                     | Convergence: The three data strands identify speaking anxiety as a notable concern among the participants and indicate a consistent pattern of more positive perceptions and higher post-intervention observational scores following AI-supported practice. The performance data provide observed pre-/post-intervention change, while the questionnaire and teacher data provide complementary perceptual and contextual evidence. |
| Confidence/comfort       | 42.55% agreed, and 13.56% strongly agreed that interaction with AI assists confidence building; approximately 6% responded negatively.                                                                                                                       | Mean confidence/comfort score increased from 1.60 to 3.90. Individual consensus scores also increased across participants.                                                                                             | Teachers reported low confidence, hesitation, and fear of judgment as important problems and described increased confidence as a potential benefit of AI-supported practice. The intervention observations also reported stronger voice projection and confidence. | Convergence: Positive perceptions of AI-supported confidence building correspond with observed improvement in confidence/comfort among the 10 assessed participants and teachers' accounts of the affective barriers to speaking.                                                                                                                                                                                                   |

|                                        |                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Speaking performance                   | Students reported positive perceptions regarding several speaking-related areas.: about 52% agreed that AI improved fluency, 76% agreed that it supported pronunciation, and 68% expressed positive views regarding grammatical improvement. | Mean total Speaking Performance & Confidence score increased from 7.10/20 to 14.40/20. Mean grammatical accuracy increased from 2.10 → 3.70, while pronunciation increased from 1.70 → 3.10, fluency/hesitancy from 1.50 → 3.70, and confidence/comfort from 1.60 → 3.90. | Teachers identified AI's potential for immediate feedback, personalized practice, and additional opportunities for speaking practice. The intervention observations also report improvements in pronunciation, fluency, and grammatical accuracy. | Convergence and Complementarity: Questionnaire perceptions, teacher accounts, and the consensus assessment showed greater post-intervention scores in all four speaking-performance dimensions, with the largest mean gains observed in confidence/comfort (+2.30) and fluency/hesitancy (+2.20), followed by grammatical accuracy (+1.60) and pronunciation (+1.40).                 |
| Low-pressure / non-judgmental practice | About 71% agreed and 21.48% strongly agreed that AI provides a meaningful, low-stakes environment for speaking practice.                                                                                                                     | The observable-anxiety score rose from 1.60 to 3.50, accompanied by improvements in grammar, fluency, and confidence/comfort                                                                                                                                              | Teachers specifically associated AI practice with reduced fear of judgment, greater freedom to practice, and opportunities for repeated practice.                                                                                                 | Complementarity: Across the three data strands, students' perceptions, post-intervention observational scores, and teacher accounts point to the potential value of low-pressure AI-supported practice for speaking practice and confidence. However, these findings do not establish that the low-pressure nature of AI interaction caused the observed changes in speaking anxiety. |
| Feedback and repeated practice         | Students identified pronunciation correction, confidence development, anxiety reduction, convenience and instant feedback among the perceived benefits of AI.                                                                                | Pronunciation, fluency and confidence scores showed notable pre/post increases; the intervention records also describe repeated AI-supported drills and feedback.                                                                                                         | Teachers identified immediate feedback, personalized learning and additional practice as important pedagogical affordances.                                                                                                                       | Complementarity: The three strands suggest that repeated practice and feedback were perceived as important affordances of AI-supported speaking practice and correspond with observed improvement in several performance dimensions.                                                                                                                                                  |

|                           |                                                                                                                            |                                                                                                                                                              |                                                                                                                                         |                                                                                                                                                                                                  |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Need for teacher guidance | Students identified lack of guidance (32.16%) as the most prominent challenge reported in the relevant questionnaire item. | The intervention was researcher-guided; the reported intervention procedure involved researcher demonstration, monitoring, feedback, and follow-up practice. | Teachers emphasized guidance, supervision, teacher knowledge and appropriate implementation as conditions for effective AI integration. | Convergence: The findings indicate that participants and teachers perceived AI as most useful when embedded within guided pedagogy rather than used as an entirely autonomous learning resource. |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Although the one-group pre-intervention/post-intervention design does not permit definitive causal attribution, the statistically significant pre- to post-intervention changes, together with the complementary questionnaire and teacher-interview evidence, suggest that sustained AI-supported speaking practice may have contributed to improvements in speaking performance, confidence, and observable manifestations of speaking anxiety.

### Recommendations

- English teachers should use some activities through AI agents in their classroom as a complementary speaking platform rather than a replacement for in-person interaction.
- Curriculum designers can integrate some AI-oriented activities into English-speaking curricula. In particular, syllabi can include structured opportunities for AI-supported learning and speaking practice.
- For the implementation of AI-associated language learning, students and instructors require adequate digital resources, flexible internet access, and pedagogical support from educational institutions that policymakers should give priority to ensure an effective setting.
- Students should be guided by proper policies and regulations for responsible engagement, and teachers must monitor and assess their AI-supported speaking activities appropriately so that they can ensure balance between AI and authentic human interaction.
- For pre-service and in-service training, teacher-instructed programs should integrate digital literacy and AI-oriented lesson delivery in language teaching.
- As universities foster learners' critical thinking, they should provide instruction and technical support to access credible AI apps for implementing AI-based teaching. When teachers feel confident in using AI and receive adequate institutional support, they may be more likely to integrate AI regularly and effectively.

### Limitations

This study has several limitations that should be considered when interpreting its findings. First, the intervention involved a relatively small, purposively selected group of

ten students from a single public university. Therefore, the findings should not be generalized to broader populations of Bangladeshi EFL learners without caution. Future studies involving larger and more diverse samples across multiple institutions would strengthen the generalizability of the findings.

Second, the study employed a one-group pre-intervention/post-intervention design without a control group. Although the statistically significant pre- to post-intervention changes indicate differences following the intervention, the design does not permit definitive causal attribution to AI-supported speaking practice. Future research could employ a control or comparison group, preferably through a quasi-experimental or randomized design, to examine the effects of AI-supported speaking practice more rigorously.

Third, the study used a researcher-developed observational measure of speaking anxiety rather than a standardized, validated anxiety scale. Future studies could incorporate validated speaking-anxiety instruments alongside observational measures to strengthen measurement validity.

Fourth, the intervention was conducted over a relatively short period of five weeks. The study therefore does not establish whether the observed changes in speaking performance, confidence, and observable manifestations of speaking anxiety would be sustained over a longer period. Longitudinal research could examine the durability of these changes.

Finally, the study focused on selected speaking-task areas and on three AI conversational agents—ChatGPT, Microsoft Copilot, and Google Gemini. Differences in AI tool capabilities, access, and feedback may influence learners' experiences and outcomes. Future research could examine a wider range of AI tools and speaking tasks across longer intervention periods. Furthermore, future research could assess the inclusion of AI conversational agents across various institutional levels, proficiency groups, and educational settings, specifically, the pedagogical factors that affect the effective application of AI-enhanced language learning.

## Conclusion

This study contributes to the existing literature, particularly in the Bangladeshi higher-education context, where evidence-based research on the pedagogical use of AI platforms remains limited. The findings contribute to understanding technology-enhanced language learning within low-resource instructional settings. English language instructors can consider AI practice in their classrooms as a supplementary pedagogical tool for facilitating personalized speaking practice. This study suggests that curriculum designers can include meaningful AI-assisted activities, reflective inquiry, and sustained speaking practices in the courses and curriculum. Additionally, higher educational institutions and educational policymakers may utilize the findings of this study to inform strategies for the responsible integration of AI into English language classrooms, with appropriate teacher guidance and student engagement.

## References

- Abdelatia, F. A. H. (2026). Students' attitudes towards chatbots in enhancing English speaking skills. *Faculty of Education Journal (Sirte University)*, 5(1), 302–318. <https://doi.org/10.37375/foej.v5i1.3825>
- Ahmad, S. (2014). A socio-psycholinguistic investigation into the correlation between English language learner motivation and the present status of EFL learning in Bangladesh. *Bangladesh Research Foundation Journal*, 3(1), 61–74.
- Ahmad, S. (2017). Motivation of the EFL Learners in Bangladesh: Sociolinguistic, psycholinguistic & ELT aspects. Amazon.
- Amoah, S., & Yeboah, J. (2021). The speaking difficulties of Chinese EFL learners and their motivation towards speaking the English language. *Journal of Language and Linguistic Studies*, 17(1), 56–69. <https://doi.org/10.52462/jlls.4>
- Annamalai, N., Eltahir, M. E., Zyoud, S., Soundrarajan, D., Zakarneh, B., & Alsalhi, N. (2023). Exploring English language learning via chatbot: A case study from a self-determination theory perspective. *Computers and Education: Artificial Intelligence*, 5, Article 100148. <https://doi.org/10.1016/j.caeai.2023.100148>
- Baker, T., Smith, L., & Anissa, N. (2019). *Educ-AI-tion rebooted? Exploring the future of artificial intelligence in schools and colleges*. Nesta. <https://www.nesta.org.uk/report/education-rebooted/>
- Ball, S., & Edelman, C. (2018). Self-efficacy, motivation, and perceived importance of English as an L2 among Japanese university students. *The Language Teacher*, 42(4), 13. <https://doi.org/10.37546/JALT.TLT.42.4-3>
- Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE Publications.
- Ding, D., & Yusuf, A. M. B. (2025). Investigating the role of AI-powered conversation bots in enhancing L2 speaking skills and reducing speaking anxiety: A mixed methods study. *Humanities and Social Sciences Communications*, 12(1), 12–23. <https://doi.org/10.1057/s41599-025-05550-z>
- Fauzi, I., Hartono, R., Rukmini, D., & Pratama, H. (2025). AI applications for EFL learners: Enhancing speaking performance and reducing anxiety with gender-based analysis. *Forum for Linguistic Studies*, 7(9), 282–301. <https://doi.org/10.30564/fls.v7i9.10192>
- Grab, M. Ö. (2025). Integrated AI chatbot practice: A pathway to improved ESL speaking skills. *Social Sciences & Humanities Open*, 12, 101933. <https://doi.org/10.1016/j.jssaho.2025.101933>
- Horwitz, E. K., Horwitz, M. B., & Cope, J. (1986). Foreign language classroom anxiety. *The Modern Language Journal*, 70(2), 125–132. <https://doi.org/10.2307/327317>
- Hidayat, M. T. (2024). English language proficiency and career opportunities: Perceptions of Indonesian university graduates. *Language Value*, 17(1). <http://doi.org/10.6035/languagev.7933>
- Hapsari, I. P., & Wu, T.-T. (2022). AI chatbots learning model in English speaking skill: Alleviating speaking anxiety, boosting enjoyment, and fostering critical thinking. In Y.-M. Huang, S.-C. Cheng, J. Barroso, et al. (Eds.), *Innovative technologies and learning* (pp. 444 – 453). Springer. [https://doi.org/10.1007/978-3-031-15273-3\\_49](https://doi.org/10.1007/978-3-031-15273-3_49)
- Imamah, I., & Suryani, D. (2025). AI-assisted language learning for preschoolers: Krashen's second language acquisition theory. *Journal of Educational Management and Instruction (JEMIN)*, 5(2), 422–436. <http://doi.org/10.22515/jemin.v5i2.12449>
- Kintsurashvili, E., Pipia, E., & Prado, M. (2026). Integrating an AI chatbot to enhance English language speaking skills: A classroom-based study with Georgian university students. *TESOL in Context*, 35(1). <https://doi.org/10.21153/tesol2026vol35no1art2313>
- Krashen, S. D. (1981). *Second language acquisition and second language learning*. Pergamon Press.
- Kayum, M. A. (2025). English language speaking anxiety (ELSA) among the undergraduate students of the private universities in Bangladesh. *International Journal of Social Science Exceptional Research (IJSSER)*, 4(4), 77–81.
- Li, Y., Chen, C.-Y., Yu, D., Davidson, S., Hou, R., Yuan, X., Tan, Y., Pham, D., & Yu, Z. (2022). Using chatbots to teach languages. In *Proceedings of the Ninth ACM Conference on Learning @ Scale* (pp. 451–455). Association for Computing Machinery. <https://doi.org/10.1145/3491140.3528329>
- Liu, M., & Huang, W. (2011). An exploration of foreign language anxiety and English learning motivation. *Education Research International*, 2011, Article 493167. <https://doi.org/10.1155/2011/493167>
- Octaberlina, L. R., Muslimin, A. I., & Rofiki, I. (2022). An investigation on the speaking constraints and strategies used by college students studying English as EFL learners. *International Journal of Learning, Teaching and Educational Research*, 21(9), 232–249. <https://doi.org/10.26803/ijlter.21.9.14>
- Pertiwi, P. C., Segoh, D., & Rohmadhani, A. (2025). Artificial intelligence in academic environments: Reducing or increasing foreign language anxiety? *Inspiring: English Education Journal*, 8(1), 100–131. <https://doi.org/10.35905/inspiring.v8i1.13009>
- Rana, M. S., & Shaikh, R. (2024). The role of English-speaking skills in career progression: A case study among Sudanese undergraduate EFL students. *World Journal of English Language*, 14(2), 349–357. <https://doi.org/10.5430/wjel.v14n2p349>

- Rahman, H., Mohammad, S., & Swarna, S. T. (2024). Voices in peril: Understanding English public speaking anxiety among university students in Bangladesh. *Cogent Education*, 11(1), Article 2355381. <https://doi.org/10.1080/2331186X.2024.2355381>
- Tran, T. T. L. (2022). An investigation into the causes of students' anxiety in learning English speaking skills. *International Journal of TESOL & Education*, 2(3), 183–196. <https://doi.org/10.54855/ijte.222312>
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Xiao, W., & Park, M. (2021). Using automatic speech recognition to facilitate English pronunciation assessment and learning in an EFL context: Pronunciation error diagnosis and pedagogical implications. *International Journal of Computer-Assisted Language Learning and Teaching*, 11(3), 74–91. <https://doi.org/10.4018/IJCALLT.2021070105>
- Zainuddin, S. Z. B., Pillai, S., Dumanig, F. P., & Phillip, A. (2019). English language and graduate employability. *Education + Training*, 61(1), 79–93. <https://doi.org/10.1108/ET-06-2017-0089>
- Zarei, M. A., Alibakhshi, G., & Nezakatgoo, B. (2024). Strategies employed by EFL teachers to cope with language learners' classroom anxiety. *TESOL Journal*, 15(4), e843. <https://doi.org/10.1002/tesj.843>
- Zou, B., Guan, X., Shao, Y., & Chen, P. (2023). Supporting speaking practice by social network-based interaction in artificial intelligence (AI)-assisted language learning. *Sustainability*, 15(4), 2872. <https://doi.org/10.3390/su15042872>