

AI-Assisted Language Learning and Enhancement of Speaking Skills among Undergraduate Students

Ms. Mary Cecilia

Research Scholar

Department of English

Anurag University

Telangana, India

23hs302a24@anurag.edu.in

Dr. Babi Duli

Assistant Professor

Department of English

Anurag University

Telangana, India

Abstract

The rapid developments in the field of artificial intelligence (AI) have greatly impacted the teaching of the English language, especially when it comes to the speaking skills of undergraduate audiences. In the context of ESL teaching in the Indian setting, English is an obligatory academic subject as well as an important career requirement, and yet the students often struggle with speaking English. The study focuses on the functionality and effectiveness of using AI-powered language learning tools in improving the speaking abilities of undergraduate students, particularly in terms of fluency, pronunciation, and speaking confidence. Using a mixed-method research design, the study included sixty undergraduate students, both in the control group and the experimental group, for an eight-week duration. In the study, the control group undertakes speaking activities using the conventional method,

while the experimental group applies speaking activities using speech recognition technology, chatbots, and pronunciation applications. This can be supported by quantitative data, which shows that AI implementation has helped improve speaking fluency and pronunciation accuracy amongst undergraduate students. The conclusion can be drawn that when AI tools are strategically employed together with tutor intervention, learners can benefit from learner-centric, low-anxiety environments that promote their oral skills. Also, it can be concluded that anxiety levels and self-confidence amongst learners can significantly improve when AI-supported environments are employed.

Keywords: Artificial Intelligence, Speaking Skills, Undergraduate Students, ESL Learning, Educational Technology

Introduction

Information technology has brought major changes to the current education sector and has influenced the teaching of the English language. Technology has transformed from being an add-on component of education to becoming an essential part of educational settings, which has created a paradigm shift in the way students access education and respond to teachers. Educators have argued that what is occurring is not just the digitization of education but a paradigm shift in language teaching and language productive skills such as speaking.

English has an important place in the education system of India as it has been made a mandatory subject and an instrumental channel for achieving success. However, despite its widespread use over a long period of time, it has been noticed that many undergraduate students continue to experience problems while developing proficient skills in English speaking. Several research studies have pointed out that lack of experience of authentic communicative situations, fear of errors, fear of evaluation by peers, and lack of opportunities for solo practice for developing expertise in English-speaking skills continue to remain serious hurdles.

In that respect, and due to such long-standing issues, English language pedagogy has

increasingly been directing its efforts toward technology-enhanced learning approaches. Digital and mobile-assisted language learning research may further show that technology has a key role to play in extending learning beyond the boundaries of the classroom and in giving learners greater control over practice. More recently, AI has become one of the major innovations in this area. AI-driven tools include speech recognition systems, conversational chatbots, and pronunciation training applications, which, through immediate feedback, adaptive practice, and interactive learning experiences, have been seen to support speaking development.

Current literature suggests that AI-powered speech recognition tools improve pronunciation accuracy and fluency by immediately allowing learners to catch their mistakes and self-correct in real time. Similarly, conversational agents and chatbots have been found to simulate genuine communicative situations that allow learners to practice speaking without fear of negative evaluation. Such an environment minimizes anxiety and allows learners to experiment with language, hence increasing their willingness to communicate. Such findings resonate with more holistic notions in language education that point to the development of learner autonomy and repeated opportunities to practice a particular skill as a main factor in such development.

From a theoretical perspective, the role of AI in language learning can be conceptualized using the framework of sociocultural theories, which promote learning using tools and interaction. This is because the use of AI represents the use of mediating tools in the language learning process, offering scaffolding, feedback, and guided practice suitable to the level of proficiency of the learner. This means that language learning software that utilizes AI supports the learner within his/her zone of proximal development.

Although there have been studies pointing to the effectiveness of using AI in language learning, many studies so far have had broad research scopes or targeted general language

abilities rather than speaking abilities. Furthermore, there have been only a few studies focusing on the use of AI technology on speaking abilities in the context of undergraduate ESL students, exploring both objective performance outcomes and subjective understandings. The following study aims to fill this research gap by exploring the use of AI technology in improving speaking abilities with a focus on fluency, pronunciation, and confidence, as well as exploring the experience of using AI technology in speaking practice and its underlying implications in language teaching in the context of undergraduate English language education.

Methodology

This study adopts a mixed methods design, where both quantitative and qualitative research methods will be utilized to explore how effectively AI tools may improve undergraduate college students' English speech skills. It was planned that this particular study design would enable both the objective evaluation of speech abilities and an analysis of participants' viewpoints.

To achieve the objectives of the study, the participants were selected and a pretest and posttest design was conducted on a sample of sixty undergraduate students of St. Pious X Degree and PG College for Women, aged between eighteen and twenty-two years. Students selected as participants belonged to various disciplines and had studied English as a second language. To select participants, they were divided into two groups, namely the control group and the experimental group, with each group consisting of thirty participants. While the control group participated in classical classroom-based speaking exercises, the experimental group participated in AI-powered speaking exercises.

Various tools were used for gathering data for this study. A speaking pre-test and post-test were conducted for measurement purposes to identify improvement in pronunciation, fluency, and speaking confidence. The criteria for testing included speech clarity, fluency, and accuracy for both groups. There were other tools besides speaking tests, such as artificial

intelligence tools for the experimental group. Examples included speech recognition software for pronunciation, speaking chat bots for speaking practice, and pronunciation learning softwares for correcting pronunciation difficulties. Semi-structured interviews were also carried out towards the end for gathering insights for students on AI-assisted speaking practices. Weekly journals maintained by the participants also helped to add value for analysis.

The experiment ran for eight weeks. At the onset of the experiment, the two groups were required to undergo a speaking pre-test. In the intervention stage, while the experimental group practiced speaking daily with the use of AI technology through techniques like pronunciation practice, guided speaking, and dialogic conversations, the control group pursued speaking through the normal speaking activities conducted by the speaking instructors.

After the completion of the intervention, the two groups undertook a speaking post-test similar to the pre-test. Semi-structured individual interviews were also carried out with selected participants from the experimental group to determine their experiences and attitudes following the use of AI for speaking practice.

Data Analysis and Results

The quantitative data collected from the pre-testing and post-testing scores was analyzed through a series of paired t-tests to ascertain the significance of enhancement in speaking skills. In addition, the qualitative data collected from the interviews and the reflective journals was analyzed through the technique of theme identification, a methodological procedure otherwise employed to seek out inherent patterns in the data. The convergence of the findings made it easy to judge the effectiveness of the use of AI tools in the development of speaking skills. The findings from the study demonstrate the existence of variances in the level of performance in speaking skills between the control group and the experimental group post the eight weeks of training. The post-testing and the pre-testing scores indicate a higher level of enhancement in the essential aspects of speaking skills achievement in the case of

students who practiced using the AI tools in comparison to the control group.

In the experimental group, speaking fluency demonstrated a statistically significant difference from pre-test to post-test at $p < 0.05$. Due to the availability of repeated practice opportunities and immediate feedback from AI-powered speech recognition tools, learners could monitor their speaking patterns and adjust them in real time. By contrast, the control group manifested only minor improvement in their fluency, due to limited individual speaking time within conventional classroom settings.

Results on pronunciation scores showed that the experimental group improved more in pronunciation accuracy compared with the control group. The phonetic feedback from AI-based pronunciation tools supported learners by pointing out where they mispronounced certain aspects, thus enabling them to practise specific corrections. It is due to these features that there was more consistency in improvement over articulation and clarity among those students who used the AI tool.

Qualitative results of the findings through interviews and reflection journals revealed the enhancement of speaking confidence of students in the experimental group. Students expressed feeling relieved practicing speaking skills with the help of AI-mediated settings, perceiving them as non-threatening and supportive learning spaces allowing them to make mistakes without fear of being judged. This helped them practice speaking more and encourage them to take part in more activities associated with speaking. Students of the control group still expressed feeling nervous about being judged by their peers and lacking individual feedback opportunities.

Discussion

Conclusions drawn from the results of the current study have demonstrated that AI-speaking practice is an efficient means of improving undergraduate students' speaking skills, especially concerning fluency, pronunciation accuracy, and confidence. Such improvement

confirmed the validity of the assumption that AI-speaking systems are beneficial and learner-centered environments for developing oral language skills.

The increased speaking fluency of the students utilizing the services of the AI tools could be attributed to the availability of practice time and immediate feedback. This is because, in a classroom setup, the opportunity to speak individually might be limited, but with the help of the technology, the learners are able to practice endlessly. This takes into consideration the past studies conducted, which brought into focus the importance of feedback while acquiring the skill of speaking fluency. The opportunity to monitor and control personal practice might have increased the autonomy of the learners.

Improvement in pronunciation skills in the experimental group highlights the benefit of AI-based speech recognition and pronunciation training systems. The phonetic instant feedback system helped the students to concentrate on the areas they need to improve. It is hard to ensure the same in a big class, and this highlights the complementary use of AI-based systems to overcome the structural shortcomings of the conventional method of teaching.

Among the most important results of the study is related to the increased level of speaking confidence demonstrated by the experimental group. The qualitative evidence suggests that the learning environments provided by AI technology removed anxieties because learners could take risks without being judged. Beyond this, it is important to cite studies done previously on technology-supported language learning, with particular emphasis on the need to create a low-anxiety context as an impetus to encourage learners to communicate.

From a sociocultural viewpoint, it could be inferred that these findings show that AI tools can play an effective role as mediational tools in second language learning. This could be because these tools use adaptive feedback and guided practices that promote language learners to work inside their zone of proximal development. At the same time, these findings emphasize that these tools work best when combined with teacher guidance.

Despite the positive outcomes, the responses among students show that there is a clear understanding among participants about the limitations of using AI-assisted learning. The participants agreed that although these technologies improved individual practice, these could never substitute the experience or the help of teachers. The importance of balanced models in language learning, therefore, still remains.

Conclusion

This research aimed at exploring how artificial intelligence could play a pivotal role in developing speaking skills for undergraduate-level students in an ESL setting. The results show that artificial intelligence-based tools can play an imperative role in developing fluent speaking skills, accuracy of pronunciation, and confident performances by providing an opportunity for individualized learning.

This study proves that AI-supported speaking teaching is an effective addition to traditional teaching methods, especially when class size is large, making it difficult for a lecturer to give each individual an opportunity to speak. AI software helps increase autonomy on the part of a learner, thus eliminating affective factors that make speaking teaching unattractive.

On the other hand, the results highlight the value of well-balanced integration. For example, artificial intelligence can be seen not solely as a substitute teacher, but instead, the teaching bank can be enhanced through effective intelligent practices. Finally, the final area to highlight is the importance of addressing the ethical component, along with the use of privacy and technology.

Though the research is limited by the small sample and short timeframe, it still proves to be useful in understanding the practical use of AI-assisted speaking practice in higher education. Future research studies can focus on the long-term effects, speaking requirements associated with different domains, and the usage of advanced adaptive artificial intelligence

systems in language learning. In light of the above discussion, the effective use of artificial intelligence in English language learning and teaching at the undergraduate level holds lots of promise, since the use of technology should be driven by intent and human interaction.

Conflict of Interest: The corresponding author, on behalf of all the authors, declares that there are no conflicts of interest regarding the publication of this article.

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