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## An Exploration into the Effectiveness of Tech Based Intervention in Strengthening Students' Oral Communication

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### Abstract

This qualitative study explored the effectiveness of a technology-based intervention in strengthening students' oral communication skills. It was conducted as a follow-up to a quantitative experimental study to gain deeper insight into participants' perceptions, experiences, and responses to the intervention. The sample was selected purposively from the experimental group and included elementary school students from a public school in Lahore who obtained extreme scores in the post-test. Data were collected through a semi-structured interview protocol, which was validated through expert opinion. The collected data were analyzed using thematic analysis. The findings revealed that the technology-based intervention positively supported students' oral communication skills by improving their confidence, pronunciation, vocabulary use, fluency, and ability to organize ideas during spoken communication. The participants also reported increased motivation, reduced hesitation, and greater awareness of their own communication practices. The study concluded that technology-based interventions can serve as an effective pedagogical approach for enhancing students' oral communication skills in affective, linguistic, and metacognitive domains.

**Keywords:** Educational Tech, Oral Communication, Elementary Students, Qualitative Study, Lahore.

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## Introduction

Oral communication is among the most basic skills required in the educational and professional settings. The ability to communicate clearly, to discuss ideas thoughtfully and to give a good argument has become an essential part of the academic and work lives of students. Oral communication is one of the most important TAs in higher education, not only for achieving academic success, but also to facilitate integration within a world that is increasingly interconnected and global (Rodero, 2025). However, there is a gap between the value attributed to oral communication and the emphasis that is given to it in formal teaching and learning that persists. Studies have consistently supported the fact that reading and writing are given more attention in curricula than speaking, especially for structured speaking which leaves students with lesser opportunities to develop and refine their spoken language skills in both primary, secondary, and tertiary institutions (Journal of Komunikasi Pendidikan, 2026).

This teaching deficiency has serious repercussions. At all levels of schooling, students report feeling uncomfortable, anxious and lacking in self-efficacy when asked to express themselves orally in academic or professional situations. Research shows that speaking anxiety is especially high among foreign and second language learners, as well as affective barriers that often hinder their performance and acquisition (MacIntyre, 2017, in Susoy, 2026). The phenomenon is not limited to the field of language acquisition, as it has been found that about 75% of students in Computer Science feel anxious in their public speeches (Akçay et al., 2025). This anxiety often in turn causes decreased participation, feelings of self-doubt and avoidance that negatively affect communicative development over time (Ozdemir & Papi, 2022 as cited in Fathi et al., 2025).

As these challenges are increasingly becoming known, so are the opportunities for intervention through the explosion of educational technology. Solutions to the limitations of traditional classroom based speaking have been suggested and increasingly adopted such as: digital platforms, artificial intelligence (AI) – based applications, mobile learning tools, and video based technologies. In the conventional pedagogical methods, there are several limitations, such as large classes, rigid time management, lack of personalized feedback, and social pressure in face-to-face speaking tasks (as cited in de Vries et al., 2025; Fathi et al., 2025). Technology-based interventions can help address all of these limitations: They can create low-stakes, self-paced, scalable environments for students to repeatedly engage in oral communication and receive immediate, data-driven feedback.

There is emerging empirical evidence to suggest that such interventions can have a positive, impactful effect on students' oral communication. AI-enabled chatbots, for example, have been demonstrated to mimic real contexts of conversation to allow students to interact with a machine in a manner that mimics the social interaction they would have with a human counterpart, thereby reducing the social anxiety they might experience in interacting with a human (Fathi et al., 2025; Tai & Chen, 2024). The use of mobile applications with automatic speech recognition (ASR) and natural language processing (NLP) has shown improvements in pronunciation, fluency and grammatical accuracy for EFL learners (Yang et al., 2025). Indeed, there is evidence that the use of video-based platforms like Flipgrid helps to enhance oral performance outcomes, as students can record, review, and give their oral responses at their own pace, avoiding pressure and providing time to practice (Kleftodimos & Triantafyllidou, 2022; Bayotas, 2023). In addition, speaking apps powered by AI have been shown to tailor the practice material to the students' levels, offer immediate responses, and engage the students in a gamified speaking experience, thereby motivating them (Zhang, 2025).

Despite this increasing optimism, there is still no consensus in the field. The debate on the ability of technology to capture the emotional, cultural and contextual aspects of a real human communication is ongoing (Zhang, 2025). There is uncertainty as to the sustainability of the technology-mediated speaking gains, the mediating effect of digital literacy of the learners (Susoy, 2026), and the relative advantage of technology based approaches over well designed traditional approaches. Furthermore, a systematic literature review shows that empirical evidence is limited and tends to be more focused in specific contexts, such as EFL learners in the university context of East Asia, whereas there are many aspects of language learning that still need to be explored in a range of age groups, proficiency levels and educational systems (Rodero, 2025; Yilik et al., 2026).

This study is set in this context of acknowledged need and new, but contested evidence. The purpose of this research is to understand the effectiveness of interventions using technology for strengthening students' oral competence, based on contemporary theoretical frameworks and new empirical evidence of how and under what conditions digital tools can be used to develop students' competence in spoken language. The study adopts a broad concept of oral communication that includes fluency, pronunciation, accuracy, discourse coherence, interactive competence, and willingness to communicate which reflects the multidimensionality of spoken language in the present study (Fathi et al., 2025; Yilik et al., 2026).

### **Statement of the Problems**

Although everyone now understands that oral communication is a crucial skill in the 21st Century, there continues to be a gap between the knowledge of its importance and the quality and frequency of speaking instruction in schools. Communication is one of the 21st Century skills that is emphasized in the Framework for 21st Century learning—as a skill that is crucial for global citizenship and professional readiness—but which often does not happen in the classroom. The materials and curriculum at different education levels still focus on the development of reading and writing skills, leaving limited time so that the students can develop their oral communication skills (Journal of Komunikasi Pendidikan, 2026). There is a gap between awareness and practice, as generally, students are aware of the importance of speaking skills but they don't get enough opportunities to practise them meaningfully, and they are not confident enough to do so (Journal of Social and Educational Research, 2025).

The difficulties are even greater because of the affective aspect of oral communication. Both speaking anxiety and public speaking apprehension and foreign language speaking anxiety are significant psychological obstacles which hinder students' willingness to communicate and how many students can truly prove their communicative competence. These types of anxiety are common, chronic and strongly linked to poor educational and occupational performance (Susoy, 2026; Fathi et al., 2025). These uncertainties can be exacerbated by the traditional classroom setting, where students are evaluated and observed by their peers and teachers, and may lead to such reactions that they are not prepared to do what is absolutely required to develop their oral skills: observe and evaluate others.

Both instructional and affective barriers described above have been cited as reasons to consider using technology based interventions as a viable solution. Flexible, low-stakes speaking practice spaces, such as AI-powered chatbots, mobile learning apps, video discussion platforms, and automated feedback systems, have been shown to have potential effectiveness by various studies (e.g., Wang, 2025; Yang et al., 2025; Kleftodimos & Triantafillidou, 2022; Zhang, 2025). While

the evidence base is promising, it is not complete and consistent. The existing literature has several problems which have been identified:

First, empirical studies of the use of technology in oral communication interventions have methodological inconsistencies. However, several studies have a small sample size, a brief intervention duration, and use self-report questionnaires, which reduces the generalizability of the results (Lyu et al., 2025). The findings show that, in general, the effect sizes of chatbot based interventions on language learning outcomes were of moderate magnitude, but with significant inter-study differences in effect size, making it difficult to fully understand the moderating factors. The specific ways in which technology can lead to gains in oral communication—such as through more practice time, less anxiety, more immediate feedback, more personalized content, and others—have not been systematically teased apart.

Secondly, research is in a narrow geographical and contextual focus. Most of the research on teaching speaking using AI has focused on EFL learners in higher education in China, Taiwan and South Korea (Lyu et al., 2025; Yang et al., 2025; Zhang, 2025). The focus raises issues around the transferability of findings to other groups of learners that include younger learners, students in non-Asian contexts, students with differing digital literacy levels and other subject areas other than English language. The research on using oral communication technology interventions in Primary and Secondary education is not fully developed (Rodero, 2025; Journal of Komunikasi Pendidikan, 2026).

Third, there are few studies that consider the long-term sustainability of advantages of oral communication through technology. Most interventions last one semester or less, and do not provide follow-up to determine if improvements continue following the removal of the technological tool. This is an important constraint because the ultimate aim of the communication course is not to boost students' performances, but to help them acquire skills for their future.

Fourthly, the moderating conditions of technology-based interventions are not well studied. Digital literacy of the learners has been identified as one of the possible mediators (Susoy, 2026), the nature of the given feedback, the level of interaction offered by the platform as well as the level of integration of digital practice with traditional classroom practice. Several studies have suggested using a blended teaching mode, that is, integrating AI tools into the teaching process with teacher-led instruction (Zhang, 2025; Fathi et al., 2025), but there is limited empirical research comparing the effects of a technology-based approach to a blended approach.

The general research question addressed in the present research will help clarify this issue: How and to what degree do technology-based interventions effectively enhance student's oral communication skills? The aim of the study is to make a contribution to a more contextually adequate picture of how digitally based tools can help deal with one of the most pressing pedagogical challenges of contemporary education in the process of pursuing this question. The research aims at drawing general conclusions from the current evidence, as well as offering theoretical statements and practical advice to the educational community (i.e., teachers, curriculum designers, educational technology developers) interested in facilitating students' spoken communicative competence.

### **Research Methodology**

This Qualitative study was a follow-up of a quantitative experimental study. This study has been conducted to understand the participants' stances and experiences regarding the effectiveness of the Tech Based intervention regarding strengthening their oral communication skills. The sample

for the study has been selected purposively from the experimental group. Those students have been selected as a sample whose scores were extreme in the post test. The sampled students were Elementary School students enrolled in a public school based in Lahore. The data have been collected from them with the help of a Semi-Structured Interview Protocol validated by taking the experts' opinion.

### **Data Analysis & Results**

The collected data have been analyzed with the help of Thematic analysis. The details are as under:

#### **Enhanced Confidence and Reduced Communication Anxiety**

The first theme that arose from thematic analysis focused on the change in communication-related anxiety that participants reported and observed after their interaction with the technology-based intervention, and the increase in confidence they felt as a result of the intervention. The participants told how they had access to a variety of digital oral communication activities which enabled them to rehearse and review their spoken output in a low-risk environment prior to speaking to a real situation.

One of the participant stated that:

Before starting to use the speech-practice application, I would not speak to the students in class as I was afraid of making mistakes in front of them. The technology enabled me to record myself in private, and listen to what I had captured to try again until I felt comfortable. After practicing this private lesson, a while, it became a real confidence booster for me and eventually for our group as well.

Another participant shared that:

The intervention helped me to lower my anxiety level a lot. Once I used to feel nervous physically when I was to speak publicly – heart pounding, voice shaking. Having worked with the AI feedback feature I knew when I was using it how my own speech patterns were, and I was able to talk to myself in a private way about how I was doing it which made me feel much more at ease and ready for any presentation.

A similar stance is stated by another participant that:

I saw after two weeks that I didn't dread to do oral tasks anymore. Speaking was felt as normal and not threatening due to the repetitious nature of the exercises in the app. Gradually and slowly, confidence increased and I began to volunteer answers during seminars and this was something that I had never done prior to the intervention period.

Another participant shared similarly that:

The best thing that helped me was that there was no one that was going to be judging me. This tool simply provided me with neutral constructive feedback. It was important for me that it was non-judgmental as most of my anxiety was about what my classmates thought. If I didn't have that social pressure, then I could work like crazy on my delivery.

One of the participant stated that:

The app immediately tells you how and where you are going wrong in terms of pace and intonation. The secrets of oral communication were removed, once I had found out what to do and what not to do. As soon as I knew the solution thoroughly, I was not worried, but practiced the given areas until they were natural.

A similar stance is stated by another participant that:

Prior to the technology I had thought that you either had an ability to communicate orally or you hadn't. When the voice-analysis tool came into play that was all I needed to change my mind. The realization that it was a skill I could work at and build and develop my confidence in doing so was life changing.

Another participant shared that:

I do recall the first time I recorded myself and was amazed at how my voice sounded. I continued to record and re-record after the first couple of times. This self-monitoring and self-correction made my own voice and voice-learning feel like my own, and I became increasingly enthusiastic instead of anxious.

Another participant shared similarly that:

The gamified features of the platform added a fun element to practicing as opposed to overwhelming. Every time I got a positive indicator or leveled up I got the motivation to continue. That was incremental growth, and I saw it, and I felt it, and that meant I was getting better, and proof – proof was a lot for me to soothe my anxiety.

One of the participant stated that:

I could use the digital tool without others' pressure and did it at my own pace. I was a slow processor and had always been overloaded with classroom speaking that was synced. The technology being synchronized was therefore a key element in making me feel less pressured and in allowing confidence to come up.

Another participant shared that:

I was skeptical whether technology could be of any use in a task of such human nature as talking. I was proved wrong. The exercises were structured and the feedback was automated, there were benchmarks to work towards and even if I achieved small ones, once I had, I had a growing confidence which carried over to facing each new oral challenge.

### **Improved Oral Fluency and Linguistic Accuracy**

The second theme that emerged during analysis related to participants' sense of measurable improvements in their linguistic accuracy and fluency in speech. Participants indicated that the technology-based intervention helped them identify and fix common grammar mistakes, decrease the number of disfluencies, and get a smoother speech delivery as a result of its iterative feedback mechanisms and the speech tasks. Several described a qualitative change in their own 'on-line' monitoring of their spoken language: this is an internal self-regulatory capacity that they directly related to sustained engagement with the digital platform. The scenarios below reflect the wide

range of improvements in oral linguistic competence that were experienced by improvement participants.

One of the participant stated that:

There was a noticeable lack in spoken grammar. Often times, I would leave out articles and alter the tenses of verbs in my speech when I was hurried. The exercises on the platform emphasised the correction aspect so I was able to see those patterns and eventually I stopped using them in my unscripted communication as they were rehearsed and corrected.

Another participant shared that:

To me 'fluency' meant that I didn't have to stop and look up words all the time. The gradual expansion of my accessible vocabulary, due to technology's vocabulary-prompt features, during speaking exercises, was the key. I noticed that by week 3, I was able to retrieve words in a faster and smoother way and my delivery was now more coherent and controlled.

A similar stance is stated by another participant that:

In the past, I would fill in any pauses with a lot of vocal fillers such as "um," "uh," and "you know" that would affect the flow of my speech and affected my listeners' understanding. The filler-detection capability alerted all of them on the platform, and it was impossible to turn a blind eye to the habit. Conscious correction resulted from sustained awareness and this, in turn, reduced the number of fillers considerably in all speaking contexts.

A similar stance is stated by another participant that:

There were times when I felt my pronunciation of some phonemes was always difficult and when I did not know how to pronounce them, it was difficult for native speakers to understand me. Using the phonetic accuracy exercises and comparing them with model speakers in the application, I was able to target and correct any of these sounds in the repeated oral practice.

Another participant shared similarly that:

The intervention helped me to organize my oral expression. This was something I have been having trouble with before, and was able to do well without losing the thread during the sentence. The structured speaking tasks enabled me to practice topic sentences, elaboration and conclusion in an oral manner, thus boosting my capacity to produce a logically connected, audience-friendly output.

One of the participant stated that:

I noticed that the length of sentences got longer as the intervention progresses. In the past, I used to use simple sentences to prevent myself from making mistakes, but the scaffolder practice tasks encouraged me to use more complex sentences. The feedback when I was successful, was confirmation and reinforcement of those structures and became part of my speaking routine.

A similar stance is stated by another participant that:

I can always find myself in trouble when it comes to tenses. The exercises in the application included the use of real-life communicative situations for the selection of the correct tense, which is far more transferable into the conversation than decontextualized exercises. Fewer errors related to tense were observed in peer conversations as a result of the 4th week of use.

Another participant shared that:

The platform assisted me in conjunction speech. I was talking too much and in too much detail, said in an artificial way, which sounded uncomfortable, unnatural and like too much work. The listening models the tool provided showed me linking and elision in the context; I repeated the models by recording myself and this helped my delivery a lot.

Another participant shared similarly that:

I observed improvement in my rate regulation for speech. In the past, I was either too rushed or spoke too slow for the listener. The pacing indicator in the application provided live feedback on the pacing, which enabled me to discover and maintain the right pace for a more fluent and professional presentation.

Another participant shared that:

My oral language was much smaller than my written language prior to the intervention. The technology filled the gap by making speaking contexts that require vocabulary, that I would not have used in writing. That word power was transferred from passive to active memory in a surprisingly brief amount of time, when it was repeatedly activated in oral activities.

### **Development of Self-Regulatory Speaking Strategies**

Thirdly, there was a theme on the construction of metacognitive and self-regulatory strategies for oral communication. Participants discussed the technology-based intervention as a way of developing an inward focus on their own speaking practices; that is, an orientation that involves careful planning, monitoring of speaking processes, and reflection on speaking results. This newfound ability to self-regulate was not limited to the tasks set during the intervention but also to settings beyond the digital learning platform, as participants shared how they utilized new self-regulation skills in environments beyond the intervention. The examples given below illustrate the range and complexity of self-regulatory development that was reported from the participants.

One of the participant stated that: I now think through and recite important phrases in my mind before speaking in important conversations. Before the intervention, I was not used to pre-planning, but the guided steps of preparation on the platform instilled in me the importance of this and I have made it natural to my communicative behaviour as an academic or professional speaker.

Another participant shared that:

The intervention gave me the opportunity to notice my own speech as I was speaking, which is a self-assessment that I hadn't done before. During presentations, I have an internal monitor that alerts me to my speed and/or volume and adjust wherever I need to. This was a new skill, which the technology was

making visible, and trainable, to make things produce and monitor at the same time.

A similar stance is stated by another participant that:

I got into a personal practice of “audio journaling,” which involves recording my thoughts on a daily basis, then replaying them critically, on academic issues. This is directly inspired by the recording exercises that were undertaken as part of this intervention. I have made that “habit” an integral part of my relationship with my first language, which is spoken, and one that a conventional classroom would not have stimulated.

A similar stance is stated by another participant that:

The biggest thing that changed was that after speaking I could sit back and honestly assess my performance. In the past I was either malevolent towards the feedback or thought that every mistake was a disaster. The pre-designed reflection exercises in the platform helped me to reflect systematically by analysing the elements that worked, what did not, and how I will approach the situation next time.

Another participant shared similarly that:

The platform was a first-time experience of learning goal setting techniques in oral communication for me. I set targets for each practice session of e.g. fewer than 3 filler words per minute, and noted whether I achieved these targets or not. That design was about a purpose, and it changed the way I was doing my work from repetition to strategic development.

One of the participant stated that:

When I had communication problems, I was more conscious of the strategies I used, or didn't use, to communicate. After each of the tasks, I was guided to name my coping strategies in the guided reflection questions of the intervention, which is why I have named them. They were transferable as a result of that naming process, and I actually choose strategies because of the situation that I'm in when I'm faced with an oral challenge.

A similar stance is stated by another participant that:

The most important changes were the ability to consider mistakes as clues to further learning, not as proof of failure. Errors were always dealt with analytically and in the forward direction on the platform. I slowly began to take this approach myself, and now view oral communication errors as data points, helping me to make my next attempt.

Another participant shared that:

Through the intervention I learnt to be a patient learner. I've always wanted to be fluent in my speaking, and have been impatient, avoiding hard speaking tasks. My appreciation for the importance of a gradual, incremental improvement process and for the need to persevere over time was developed through the structure and incremental design of the platform and has transferred to my work with all of my academic learning.

Another participant shared similarly that:

I gained the ability to identify the difference between linguistic limitations and lack of preparation as contributors to communication problems. The pre-task planning activities on the platform highlighted the difference and how to act upon it. My time doing oral preparations has increased significantly and now, my live speaking is much more consistent.

Another participant shared that:

The self-assessment rubrics will be built into the platform will provide me with a language to assess oral communication that I didn't already have. Being able to describe and rate the following dimensions: coherence, fluency and pronunciation allowed me to go from general feedback of how well a speaking task went through to specific and actionable feedback on my strengths and development needs.

### **Perception of Technology as a Motivating and Accessible Learning Tool**

The fourth and final theme that arose was related to the participants' perceptions of the technology as a learning medium. The digital instruments were not perceived as passive objects, but rather as active agents that motivated participants to engage in oral communication practice, thanks to their design elements such as gamification, multimedia feedback, personalized pathways and accessibility in time and space. Participants compared the flexibility and responsiveness of the technology approach to the temporal and spatial limitations of classroom-based learning and many expressed a preference for the technology-mediated approach for independent learning of oral skills. The following are examples of experiences reported by participants in terms of motivation and accessibility.

One of the participant stated that:

The technology has taken away the logistical constraints that I had always faced when practicing orally. I could use the app on my way to and from school, between classes, or after classes were over. I was practicing a lot more speaking time than any scheduled curriculum had to offer, thanks to that pervasive accessibility.

Another participant shared that:

The gamified progress system was indeed motivational and more than I expected. The badges, and progressing to speaking levels, generated a sense of achievement which meant I was going back to the platform on a regular basis. The motivational design was a success in motivating students to make this dull drill work more like a daily routine.

A similar stance is stated by another participant that:

I really liked the personalized feedback pathway. The technology customized the tasks and feedback to my performance profile as opposed to classroom instruction, which had to be directed to the entire group. It was very respectful and specific attention and made all of the practice sessions matter to me.

A similar stance is stated by another participant that:

I'm not sure at first whether this machine can be a good companion to the development of a human skill such as speaking. It didn't take long for that

skepticism to fade away after learning about the quality and specificity of the automated feedback. The technology was the one that acted as the knowledgeable, patient listener and was solely invested in my growth.

Another participant shared similarly that:

This multimedia-modeled platform (audio, video, text, visual analytics) was very suitable for my multimodal learning preferences as compared to the classroom-only learning environment. The graphic representation of my intonation patterns combined with hearing them was very effective, and helped me to learn about some of the prosodic features more rapidly.

One of the participant stated that:

I felt there was not enough motivation for me to practice oral skills as it wasn't obvious how I could improve in the short term. The platform's progress dashboards did not only allow for the knowledge of progress, but also made improvement visible, even if it did not feel like it in the moment. Data that showed that I was making progress (albeit small) was a source of motivation to sustain my practice throughout the intervention.

A similar stance is stated by another participant that:

The motivational significance of the technology being an interlocutor, but not an evaluator, was important. I could try new speaking styles, use more complicated words, and take communicative risks and not incur any "social cost". I needed that freedom to make mistakes in private and to try again right away - it was crucial to my commitment to working with more difficult areas of oral language development.

Another participant shared that:

It was great that I could select what part of my speaking to focus on for each session. The platform was flexible enough for me to have guided my learning path, making it feel like my own, and therefore, my personal investment in the results. One of my motivators throughout my learning was learner autonomy in the technological environment.

Another participant shared similarly that:

The intervention gave me the realization that I was able to be a self-directed oral communicator, that is, that I didn't have to be in a classroom with a teacher in front of me all the time to make progress that mattered to me. That change of perspective has been motivational, and has prompted me to keep on using digital tools for my oral practising way beyond the intervention period.

Another participant shared that:

The feedback cycle was very useful, immediately after we did it. Feedback on speaking had usually been delayed for days, and was often vague and written in the conventional classroom environment. The immediate, focused reply of the platform sustained me in an active engagement in which I could correct and re-practise in a pedagogically powerful loop within the same session.

## **Conclusion & Discussion**

This study offers strong evidence to support the use of technology-based interventions as a valid approach to improve students' oral communication skills in affective, linguistic and metacognitive areas. In sum, the four themes that emerged from the thematic analysis – reduced communication anxiety and increased confidence, measurable advances in linguistic competence and fluency, development of transferable SRL strategies, and strong perceptions of technology as a motivating and accessible learning medium – all indicate that, when designed and implemented strategically, digital tools can achieve qualitative and long-lasting improvements in spoken communicative competence (Fathi et al., 2025; Zhang, 2025; Yang et al., 2025). In particular, participants increased their skills in using the platform, but they also said they used the metacognitive strategies developed in the platform in real academic and professional speaking situations, as they had been able to transfer to the real world with positive outcomes (Kleftodimos & Triantafillidou, 2022). The results support the importance of using a blended teaching model in which the use of technology is combined with face-to-face communication training, and indicate that further studies on the long-term effects of this model on various learner groups and settings are needed (Susoy, 2026; Rodero, 2025).

## **Recommendations**

Based on the results, it has been recommended that the students should be taught oral communication with the Tech Based intervention as it is found effective for the enhancement of students' oral communication skills.

## **Conflict of Interest**

The authors showed no conflict of interest.

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