JIGE 7 (4) (2026) 3503-3524
JURNAL ILMIAH GLOBAL EDUCATION
ejournal.nusantaraglobal.ac.id/index.php/jige
DOI: https://doi.org/10.55681/jige.v7i4.7240

Exploring English Teachers' Experiences in Integrating Virtual Reality-Based Audiovisual Media into EFL Speaking Instruction

Yusnevyta Irni[1*], Teguh Sulistyo[1], Umi Tursini[1]
[1] Faculty of English Language and Literature, Universitas PGRI Kanjuruhan Malang, Indonesia
Corresponding author email: yusnivita986@gmail.com

Article Info

Article history:

Received September 16, 2026
Approved October 28, 2026

Keywords:

Virtual Reality, EFL speaking instruction, teachers' experiences, technology integration.

ABSTRACT

The integration of Virtual Reality (VR)-based audiovisual media has created new possibilities for developing more contextualized and engaging English speaking instruction. However, limited attention has been given to teachers' experiences as key agents in implementing VR technology in EFL classrooms. This study aimed to explore English teachers' experiences in integrating VR-based audiovisual media into speaking instruction, focusing on teachers' instructional strategies, pedagogical roles, and challenges and opportunities encountered during implementation. A qualitative case study design was employed at MTs Mambaul Ulum Arjasa Kangean, East Java, Indonesia. The participants were three English teachers selected through purposive sampling. Data were collected through classroom observations, semi-structured interviews, and documentation, and were analyzed using thematic analysis. The findings revealed three major themes. First, teachers integrated VR through structured speaking activities involving preparation, immersive exploration, collaborative interaction, and reflective feedback. Second, teachers enacted multiple roles as facilitators, motivators, technological guides, classroom managers, and providers of formative feedback to support students' speaking development. Third, teachers experienced both challenges and opportunities, including limited technological resources, technical difficulties, and the need for digital competence, while recognizing VR's potential to enhance students' motivation, confidence, and authentic communication experiences. The study concludes that effective VR integration depends not only on technological availability but also on teachers' pedagogical knowledge, adaptability, and institutional support. These findings highlight the importance of teacher professional development and adequate infrastructure to maximize the potential of VR-based audiovisual media in EFL speaking instruction.

Copyright © 2026, The Author(s).
This is an open access article under the CC–BY-SA license

How to cite: Irni, Y., Sulistyo, T., & Tursini, U. (2026). Exploring English Teachers' Experiences in Integrating Virtual Reality-Based Audiovisual Media into EFL Speaking Instruction . *Jurnal Ilmiah Global Education*, *7*(4), 3503–3524. https://doi.org/10.55681/jige.v7i4.7240

INTRODUCTION

The rapid development of digital technology has significantly transformed English language teaching and learning practices (Ahmadi, 2018; Procel et al., 2024). In the context of English as a Foreign Language (EFL), technology integration has created new possibilities for

developing more interactive, meaningful, and learner-centered instructional environments. Among the four language skills, speaking remains one of the most challenging skills for EFL learners because it requires the simultaneous coordination of linguistic knowledge, cognitive processing, and psychological readiness (Amir & Rustam, 2025; Ngo & To, 2025; Yu, 2022). Learners are expected to formulate ideas, select appropriate vocabulary, apply grammatical structures, produce accurate pronunciation, and maintain interaction in real-time communication (Shadiev et al., 2026). These complex demands often cause learners to experience difficulties in developing speaking proficiency, particularly when classroom environments provide limited opportunities for authentic communication.

Traditional speaking instruction frequently occurs within restricted classroom contexts where students have limited exposure to real-world communication situations (Wright et al., 2025). Although communicative language teaching has encouraged greater interaction, many EFL classrooms still face challenges in creating authentic environments that allow learners to practice speaking naturally and confidently (Farooq, 2015; Toro et al., 2018). Limited classroom time, large numbers of students, and learners' fear of making mistakes may reduce students' willingness to communicate. Therefore, innovative approaches are needed to provide learners with contextualized speaking experiences that can bridge the gap between classroom learning and real-life language use.

The advancement of educational technology has introduced various digital tools that support language learning, and Virtual Reality (VR) has emerged as one of the most promising technologies in this field (Huang et al., 2021). Virtual Reality refers to computer-generated three-dimensional environments that enable users to experience a sense of presence and interaction within simulated contexts. By combining audiovisual elements, immersive environments, and interactive features, VR provides learners with opportunities to engage in realistic communication situations. In EFL speaking classrooms, VR can simulate authentic environments such as international meetings, tourism interactions, workplace communication, and daily conversations, allowing learners to practice English in meaningful contexts (Yan et al., 2024).

The integration of VR into language learning is supported by experiential learning theory, which emphasizes that knowledge is constructed through active participation and meaningful experiences (Kolb, 2014). Through VR environments, learners are not merely receiving linguistic information but actively engaging in communication tasks that resemble real-life situations. Furthermore, situated learning theory proposed by Lave and Wenger (1991) highlights the importance of contextual learning, suggesting that language acquisition becomes more meaningful when learners participate in socially and culturally relevant activities. Therefore, VR audiovisual media has the potential to provide contextualized experiences that support learners' communicative competence.

Previous studies have demonstrated several benefits of VR implementation in language education. Medel et al. (2024) found that VR-based simulations helped reduce students' public speaking anxiety by providing a safe environment where learners could practice speaking without excessive fear of evaluation. Similarly, Yan et al. (2024) reported that VR role-playing activities contributed to improvements in pronunciation and conversational fluency among secondary school students. In addition, Lee et al. (2024) revealed that immersive learning environments enhanced learner motivation and engagement because students perceived VR

activities as interactive and meaningful experiences. These findings indicate that VR has considerable potential as an innovative medium for supporting speaking instruction.

Despite its potential benefits, the successful integration of VR in language classrooms involves various challenges. The implementation of VR requires adequate technological infrastructure, teacher competence, appropriate instructional design, and institutional support. Issues such as limited access to VR devices, technical difficulties, insufficient teacher training, and concerns regarding classroom management may influence the effectiveness of VR implementation (Ward et al., 2025). Moreover, technology itself does not automatically guarantee successful learning outcomes; rather, teachers play a central role in transforming technological tools into meaningful pedagogical practices. Teachers are responsible for selecting appropriate VR materials, designing communicative activities, guiding students during immersive experiences, and evaluating learning processes.

Although previous studies have provided valuable insights into the educational potential of VR, most existing research has primarily focused on students' perceptions, motivation, anxiety reduction, or measurable language outcomes. Limited attention has been given to teachers' experiences as the main agents responsible for adopting and implementing VR technology in classroom contexts. Understanding teachers' experiences is essential because technology integration is influenced not only by technological affordances but also by teachers' beliefs, pedagogical knowledge, instructional strategies, and contextual challenges. Therefore, further investigation is needed to explore how English teachers experience, interpret, and manage the integration of VR audiovisual media in speaking instruction.

The present study addresses this research gap by exploring English teachers' experiences of integrating Virtual Reality audiovisual media in speaking classes. Unlike previous studies that mainly examined students' learning outcomes, this study focuses on teachers' perspectives as the key actors who design, facilitate, and evaluate VR-based learning activities. By investigating teachers' practices, roles, and challenges, this study provides deeper insights into the practical realities of VR implementation in EFL speaking classrooms. This focus is important because the effectiveness of VR integration depends not only on the technology itself but also on how teachers design and manage learning activities. Teachers' experiences can therefore reveal the pedagogical strategies and practical considerations involved in transforming VR into meaningful speaking practice. Furthermore, understanding their perspectives helps explain the contextual factors that may support or hinder the successful implementation of VR in EFL classrooms.

The findings of this study are expected to contribute theoretically and practically to technology-enhanced language learning. Theoretically, this study extends discussions on immersive learning by emphasizing the importance of teacher experience in technology integration. Practically, the findings may provide implications for English teachers, educational institutions, and policymakers regarding effective strategies, professional development, and institutional support for implementing VR audiovisual media in speaking instruction. Based on this rationale, this study is guided by the following research questions: (1) How do English teachers integrate Virtual Reality audiovisual media into speaking classes? (2) What roles do English teachers assume when implementing Virtual Reality audiovisual media in speaking instruction? and (3) What challenges and opportunities do English teachers experience during the integration of Virtual Reality audiovisual media in speaking classes?

METHODS

This study employed a qualitative case study design to explore English teachers' experiences of integrating Virtual Reality (VR) audiovisual media into speaking classes. A qualitative approach was selected because it enables researchers to understand participants' experiences, interpretations, and teaching practices within their natural contexts (Creswell & Poth, 2016). A case study design was chosen because this research focused on a bounded educational setting and aimed to obtain an in-depth understanding of how teachers implement and experience VR integration in speaking instruction.

This study was conducted within a constructivist paradigm, which views knowledge as constructed through experience, interaction, and contextual engagement. The integration of VR audiovisual media was examined through experiential learning theory (Kolb, 2014), which emphasizes learning through meaningful experiences, and situated learning theory (Lave & Wenger, 1991), which highlights the relationship between learning and authentic contexts.

The research was conducted at MTs Mambaul Ulum Arjasa Kangean, East Java, Indonesia. The school was selected purposively because it represents an EFL learning context where technology integration is implemented within a relatively limited-resource environment. Although the school is located in an island area, it has attempted to incorporate digital learning tools into classroom practices through the use of audiovisual media and available technological facilities.

The participants of this study were three English teachers selected through purposive sampling. Purposive sampling was applied because the participants were selected based on specific criteria related to the research objectives (Tajik et al., 2025). The criteria included: (1) being active English teachers, (2) having experience integrating VR or audiovisual media into speaking instruction, and (3) being willing to participate in the research process.

Data collection was conducted through classroom observations, semi-structured interviews, and documentation (Almusaed et al., 2025). The combination of these techniques was employed to obtain comprehensive information regarding teachers' experiences, practices, and challenges in integrating VR audiovisual media. Classroom observations were conducted during the implementation of speaking lessons that integrated Virtual Reality (VR)-based audiovisual media. A total of three classroom observations were carried out, with one observation conducted for each participating teacher. Each observation lasted approximately 80–90 minutes, covering one complete teaching session. One of the researchers acted as a non-participant observer and recorded the instructional process using observation guidelines and field notes. The observations focused on how teachers prepared VR-based activities, introduced the VR media, facilitated students' speaking practice, and managed classroom interactions and technological aspects during instructio.

Semi-structured interviews were conducted with three English teachers (coded as R1, R2, and R3) after the classroom observations. The interviews were conducted face-to-face (offline) in Indonesian to enable participants to express their experiences more comfortably and comprehensively. Each interview lasted approximately 30–45 minutes and was audio-recorded with the participants' permission. The recordings were subsequently transcribed verbatim by the researcher before being translated into English for reporting purposes. The interview protocol was developed based on the research questions and explored three main areas: (1) teachers' strategies for integrating VR audiovisual media, (2) teachers' roles during VR-based speaking instruction, and (3) the challenges and opportunities they experienced. To ensure ethical compliance, all

participants provided informed consent and agreed that the interview data could be used for research publication. Their identities were anonymized using respondent codes (R1, R2, and R3). Documentation was also collected to support and validate the findings from observations and interviews. The documents included lesson plans, VR-based teaching materials, and other relevant instructional resources used during speaking activities.

The collected data were analyzed using thematic analysis following Clarke and Braun (2017) framework. Thematic analysis was selected because it provides a systematic procedure for identifying, analyzing, and reporting patterns within qualitative data. The analysis consisted of six stages. *First*, the researcher became familiar with the collected data by repeatedly reading interview transcripts, observation notes, and documents. *Second*, initial codes were generated by identifying meaningful segments of data related to teachers' experiences. *Third*, the researcher searched for potential themes by grouping related codes. *Fourth*, the themes were reviewed to ensure their relevance to the research questions. *Fifth*, the researcher defined and named the themes based on the identified patterns. Finally, the researcher produced a report by interpreting the themes and connecting them with relevant theoretical perspectives.

The analysis focused on three main areas: teachers' strategies in integrating VR audiovisual media, teachers' roles in VR-based speaking instruction, and challenges and opportunities experienced during implementation. These three areas were used as the main analytical focus to organize and interpret the themes emerging from the data. By focusing on these areas, the analysis provided a deeper understanding of teachers' experiences and the practical realities of implementing VR audiovisual media in speaking instruction.

The trustworthiness of the findings was ensured through credibility, transferability, dependability, and confirmability criteria proposed by Lincoln & Guba (1982). Credibility was established through methodological triangulation by comparing data from observations, interviews, and documentation. Member checking was also conducted by allowing participants to review the interpretation of interview data. Transferability was supported by providing detailed descriptions of the research context and participants. Dependability was maintained through systematic documentation of the research procedures, while confirmability was ensured by grounding interpretations in participants' experiences and collected evidence.

RESULTS AND DISCUSSION

Result

The thematic analysis of classroom observations, semi-structured interviews, and documentation generated three major themes that addressed the research questions: (1) teachers' strategies in integrating Virtual Reality (VR)-based audiovisual media into speaking instruction, (2) teachers' roles during VR-based speaking activities, and (3) teachers' perceived challenges and opportunities in implementing VR (see Figure 1).

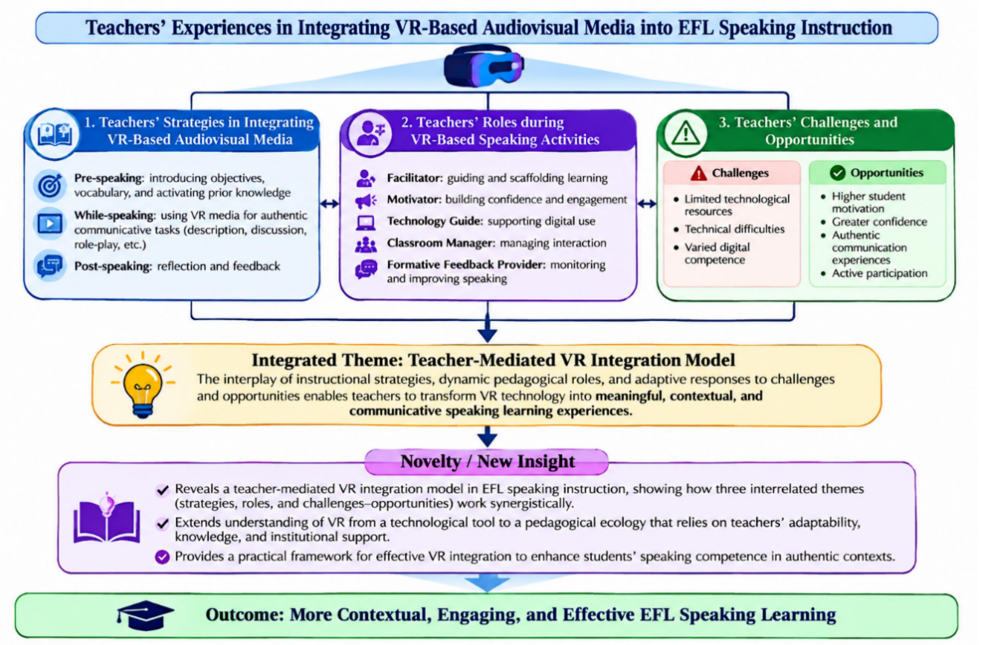


Figure 1. Teachers' Strategies in Integrating VR-Based Audiovisual Media into Speaking Instruction

Source: Processed by researchers

The findings revealed that all three participants integrated Virtual Reality (VR)-based audiovisual media into speaking instruction through carefully planned instructional stages consisting of pre-speaking, while-speaking, and post-speaking activities. Rather than using VR merely as an entertaining technological tool, the teachers positioned it as a contextual learning medium that supported communicative language teaching and encouraged students to engage in authentic speaking experiences. Data from classroom observations, interviews, and teaching documents consistently demonstrated that the teachers designed learning activities to maximize students' interaction with the virtual environment before encouraging oral production.

During the pre-speaking stage, the teachers prepared students by introducing the lesson objectives, activating their prior knowledge, and presenting key vocabulary and expressions related to the VR content. The teachers believed that students required sufficient linguistic preparation before entering the virtual environment in order to reduce communication anxiety and facilitate meaningful interaction

R1 explained:

> "Before students use the VR media, I first explain the topic and introduce important vocabulary related to the virtual environment. This preparation helps students understand what they will observe and gives them more confidence to speak afterward."

R1's statement indicates that the pre-speaking stage served as an important form of linguistic and cognitive scaffolding before students engaged with the VR environment. The teacher recognized that immersion in a virtual context alone was not sufficient to ensure successful speaking performance; students first needed relevant vocabulary and an understanding of the topic to interpret the virtual experience and express their ideas. Introducing key vocabulary and explaining

the topic beforehand may also have reduced students' uncertainty and anxiety, as they entered the VR activity with greater linguistic preparedness. This suggests that teachers strategically used the pre-speaking stage to build students' confidence and provide the language resources necessary for meaningful communication. Therefore, the findings demonstrate that VR integration was not simply a matter of exposing students to immersive technology, but involved careful pedagogical preparation to ensure that the technology supported the intended speaking objectives.

This practice was consistently observed during classroom observations. Before students watched the VR-based audiovisual media, the teacher displayed several keywords, asked prediction questions, and encouraged students to share their existing knowledge about the topic. For example, when introducing a virtual tourism environment, students were asked to identify familiar places, predict possible conversations, and discuss useful expressions that might be used during the activity.

Similarly, R2 emphasized the importance of preparing students linguistically before exposing them to immersive media.

> *"*Students cannot immediately speak after using VR. They need vocabulary support and examples of expressions first. Otherwise, they may understand the situation but struggle to express their ideas.*"*

R2's statement indicates that linguistic preparation played a crucial role in helping students transform their understanding of the VR context into spoken language. Although students might comprehend the situations presented in the virtual environment, a lack of vocabulary and appropriate expressions could limit their ability to communicate their ideas effectively. The use of model dialogues and pronunciation practice therefore functioned as scaffolding that provided students with linguistic resources before they were required to speak independently. This suggests that VR immersion alone was not considered sufficient to develop speaking skills; rather, its effectiveness depended on the teacher's ability to provide appropriate language support before the immersive activity.

The consistency between the interview, observation, and documentation data further strengthens this finding. The repeated use of vocabulary-building activities, model dialogues, and pronunciation practice demonstrates that linguistic preparation was a deliberate and systematic component of the teachers' instructional design. In this context, the pre-speaking stage served as a bridge between students' comprehension of the virtual situation and their ability to produce meaningful oral communication. Therefore, the findings suggest that teachers played an important mediating role in maximizing the pedagogical potential of VR by ensuring that students were linguistically prepared to participate in the subsequent speaking activities.

According to R2,

> "The VR environment gives students ideas to talk about because they can actually see the situation. After watching, they discuss with their partners and create conversations based on what they experienced."

R2's statement suggests that VR provided students with a concrete and meaningful context that facilitated the generation of speaking ideas. Unlike conventional speaking activities that may

require students to imagine a situation from limited visual information, the immersive environment allowed students to directly observe contextual details that could become topics for discussion. This contextual richness appeared to reduce the difficulty of generating ideas and gave students a clearer basis for constructing their utterances. The finding is particularly relevant to speaking instruction because difficulty in speaking may arise not only from limited language knowledge but also from students' inability to determine what to talk about.

Furthermore, the students' interaction during the tour guide and visitor role-play indicates that VR was used as a stimulus for collaborative communication rather than as a passive viewing medium. The virtual experience provided the content and context, while pair and group interaction transformed that experience into opportunities for oral production. The observation of longer utterances and greater willingness to initiate conversations further suggests that the immersive context may have increased students' engagement and communicative readiness. Therefore, the findings indicate that the pedagogical value of VR lies in its ability to provide authentic and concrete experiences that encourage students to move from observation to discussion and, ultimately, to meaningful spoken interaction.

Likewise, R3 highlighted that VR allowed students to practice English within realistic situations rather than relying solely on textbook exercises.

> "Usually students only imagine the situation from pictures, but VR lets them experience the place directly. It becomes easier for them to describe what they see and continue the conversation."

R3's statement indicates that VR provided students with a more concrete and realistic context for speaking practice. Unlike static pictures or textbook-based activities, VR allowed students to experience and observe the virtual environment directly, giving them richer contextual information to support their spoken responses. This direct experience appeared to make it easier for students to describe what they saw and develop their ideas into conversations. Therefore, VR functioned not only as audiovisual media but also as a contextual stimulus that helped students connect their language knowledge with meaningful communicative situations.

Observation notes indicated that students demonstrated greater enthusiasm during VR-assisted speaking activities. Many students voluntarily responded to teachers' questions, collaborated actively with classmates, and attempted to communicate even when they lacked complete linguistic accuracy. Rather than focusing on grammatical perfection, teachers encouraged students to prioritize meaningful communication.

During the post-speaking stage, teachers facilitated reflection and feedback sessions. Students were invited to present their conversations, share their experiences using VR, and discuss language difficulties encountered during the activities. Teachers then provided corrective feedback on pronunciation, vocabulary, grammar, and fluency while maintaining students' confidence.

R1 stated,

> "After students finish speaking, we discuss their performance together. I give feedback on pronunciation and vocabulary, but I try not to interrupt while they are speaking because I want them to communicate freely."

R1's also shows that the post-speaking stage provided students with an opportunity to become aware of their own language use after completing the VR-based task. Rather than interrupting students during communication, teachers allowed them to complete their ideas and then used the reflection session to identify difficulties related to pronunciation, vocabulary, and other aspects of speaking. This indicates that feedback was integrated as a follow-up process through which students could recognize their strengths and areas for improvement based on their actual communicative experience. Thus, the post-speaking stage extended the learning process beyond the VR experience itself by helping students reflect on how effectively they had used English in the situation and how they could improve their future speaking performance.

This approach was also evident during classroom observations. Teachers postponed most language corrections until students completed their speaking performances, allowing communication to flow naturally throughout the activities. Such instructional practices reflected communicative language teaching principles, where fluency development is prioritized before language accuracy.

Documentation analysis further supported these findings. The reviewed lesson plans consistently organized speaking instruction into sequential stages comprising vocabulary preparation, VR exploration, pair or group discussions, speaking performances, and reflective feedback. The integration of VR audiovisual media was therefore embedded within the instructional design rather than functioning as an isolated technological activity.

Overall, the findings indicate that teachers integrated VR-based audiovisual media through structured pedagogical strategies that emphasized contextual learning, collaborative interaction, and communicative speaking practice. The implementation was characterized by systematic preparation before VR exposure, authentic communication during immersive experiences, and reflective feedback following speaking activities. These strategies demonstrate that teachers viewed VR not simply as technological innovation but as an instructional medium capable of supporting meaningful language learning experiences.

Teachers' Roles During VR-Based Speaking Instruction

The second theme emerging from the thematic analysis concerns the various pedagogical roles assumed by English teachers during the implementation of VR-based audiovisual media in speaking instruction. Data from classroom observations, interviews, and documentation revealed that teachers performed multiple interconnected roles throughout the learning process. Rather than serving solely as knowledge transmitters, the participants acted as facilitators, learning motivators, technological guides, classroom managers, and providers of formative feedback. These roles enabled students to engage actively with the immersive learning environment while maintaining meaningful communication during speaking activities.

1) Teachers as Facilitators of Learning

The findings indicate that the participants primarily viewed themselves as facilitators who created opportunities for students to construct their own learning experiences through interaction with VR environments. During classroom observations, teachers minimized direct explanations once students entered the virtual environment. Instead, they encouraged students to observe, explore, discuss, and express their own interpretations of the situations presented in the VR media.

R1 explained:

> "When students are already using the VR media, I don't explain too much anymore. I let them observe first, then I ask guiding questions so they can express their own ideas."

Similarly, R2 stated:

> "The students become more active when they discover information themselves. My role is to help them organize their ideas rather than giving them all the answers."

R1 and R2's statements further demonstrate a shifjant in the teacher's position from being the primary source of information to becoming a facilitator who supports students' independent learning. By limiting direct explanations and allowing students to explore the virtual environment first, teachers provided space for learners to take greater responsibility for interpreting the situations they encountered. This role also encouraged student autonomy because learners were given opportunities to formulate their own ideas rather than relying on predetermined answers from the teacher. The findings therefore suggest that teachers' facilitation was essential in maintaining a balance between providing sufficient guidance and allowing students to actively construct meaning from their VR experiences. In this context, VR created the learning space, while the teacher's facilitative role ensured that students could use that space purposefully for speaking development.

The observation findings suggest that teachers' role as facilitators extended beyond merely supervising students' use of VR technology. Instead, teachers intentionally employed guiding questions as a form of pedagogical scaffolding that supported students in constructing meaning from their immersive experiences before expressing their ideas orally. Rather than providing direct explanations or ready-made answers, the teachers encouraged learners to observe, interpret, and connect the virtual context with their existing linguistic knowledge. This instructional approach enabled students to become active meaning-makers, where speaking emerged as the result of cognitive processing and contextual interpretation rather than simple repetition of language forms.

The use of open-ended questions such as *"What do you notice?"*, *"Can you describe this place?"*, and *"How would you respond if you were in this situation?"* also indicates that teachers deliberately shifted classroom interaction from teacher-centered instruction toward learner-centered communication. These questions encouraged students to analyze the virtual environment, organize their thoughts, negotiate meaning with peers, and gradually formulate spoken responses based on authentic contexts. Consequently, the teachers' facilitative role was not limited to assisting students in operating VR technology, but also involved creating cognitive and communicative support that enabled learners to develop confidence and autonomy in speaking.

Taken together, these findings reveal that facilitation in VR-based speaking instruction represents a process of pedagogical mediation, in which teachers transform immersive technological experiences into meaningful communicative learning opportunities. This finding suggests that the effectiveness of VR does not primarily derive from the technology itself, but from teachers' ability to guide students in interpreting, contextualizing, and verbalizing their experiences through appropriate instructional support.

2) Teachers as Motivators

Another important role identified in the findings was that of motivating students to participate confidently in speaking activities. The immersive nature of VR attracted students' attention; however, teachers recognized that many learners still experienced anxiety when speaking English. Consequently, participants consistently provided encouragement and emotional support throughout the lessons.

R3 commented:

> "Some students are still afraid of making mistakes. I always remind them that communication is more importt than perfect grammar."

Likewise, R1 stated:

> "I praise students whenever they try to speak. Even if their sentences are not perfect, I appreciate their effort because confidence is very important."

R3 and R1's statements indicate that teachers' motivational support addressed the affective barriers that could prevent students from participating in English-speaking activities. The findings suggest that students' willingness to speak was influenced not only by their linguistic ability but also by how comfortable and confident they felt when using the language. By recognizing students' efforts and reducing the emphasis on mistakes, teachers helped create a more supportive atmosphere in which learners were willing to take risks and express themselves. The gradual increase in participation observed in the classroom further suggests that consistent encouragement may have strengthened students' willingness to communicate. Therefore, the teachers' motivational role was important in turning the immersive potential of VR into active speaking participation, particularly for students who initially lacked confidence in using English orally.

During classroom observations, teachers frequently used positive reinforcement through verbal praise, smiles, and encouraging expressions. Students who initially hesitated to speak gradually became more willing to participate after receiving supportive responses from the teachers. This motivational role contributed to creating a classroom atmosphere where students felt safe to experiment with language.

3) Teachers as Technological Guides

The findings also reveal that teachers functioned as technological facilitators by assisting students in operating the VR equipment and solving technical problems during classroom activities. Although students were generally enthusiastic about using VR, many required initial guidance regarding how to use the devices effectively.

R2 explained:

> "Before the activity begins, I demonstrate how to use the VR headset and explain what students should pay attention to during the virtual experience."

R3 added:

> "Sometimes students focus too much on the technology instead of the speaking task. I remind them that the goal is communication, not just watching the video."

The findings show that teachers' technological competence was closely related to the smooth implementation of VR-based instruction. Providing technical instructions before the activity allowed students to become familiar with the equipment and reduced the likelihood of repeated interruptions once the speaking task had started. This was particularly important because classroom time could otherwise be dominated by questions about device operation rather than language practice. The teachers' ability to respond quickly to technical difficulties also helped maintain the continuity of the lesson and prevented students from losing their engagement with the speaking task. Thus, technological guidance can be understood as an essential preparatory component that enabled VR to function efficiently within the classroom and ensured that technical demands did not overshadow the primary purpose of developing students' speaking skills.

Observation notes indicated that teachers demonstrated how to wear the VR devices, navigate the virtual environment, and operate the audiovisual controls before students began the learning activities. During the lesson, teachers responded promptly whenever students experienced technical difficulties, ensuring that technological issues did not interrupt the speaking practice. Documentation from lesson plans also showed that teachers allocated specific time for explaining the use of VR equipment before the main instructional activities, indicating careful planning for technology integration.

Teachers as Classroom Managers

The implementation of VR required teachers to adopt effective classroom management strategies to ensure that all students remained engaged despite the limited availability of VR equipment. Classroom observations revealed that teachers organized students into pairs or small groups, established clear rules for device usage, and coordinated turn-taking efficiently. R1 explained:

> "Because we have limited VR devices, students have to take turns. While waiting, the other students discuss the task or prepare their conversations."

Similarly, R2 stated:

> "I divide students into groups so everyone still has something to do while waiting to use the VR media."

Limited access to VR devices became a factor that shaped how the teachers organized classroom activities. Rather than allowing the equipment shortage to reduce students' learning opportunities, the teachers arranged parallel tasks that kept students involved while waiting for their turn. This arrangement transformed the waiting period into an additional learning opportunity, as students could prepare dialogues, exchange ideas, and rehearse their speaking with peers. It also shows that managing VR-based instruction involved more than regulating students' access to the devices; teachers had to distribute learning opportunities fairly and

maintain students' involvement across different stages of the lesson. Consequently, effective classroom management enabled the teachers to overcome an infrastructural limitation while still providing continuous opportunities for speaking practice.

Observation data demonstrated that these strategies minimized idle time and maintained students' engagement throughout the lesson. Students who were not using the VR devices actively participated in vocabulary discussions, dialogue preparation, or peer collaboration, ensuring continuous learning despite technological limitations.

Teachers as Providers of Feedback

The final role identified from the data was teachers' responsibility for monitoring students' language performance and providing constructive feedback. Rather than correcting errors immediately during communication, participants generally postponed corrective feedback until students had completed their speaking performances.

R3 explained:

> "I let students finish speaking first. Afterward, we discuss together which pronunciation, vocabulary, or grammar can be improved."

R2 similarly noted:

> "If I interrupt students every time they make mistakes, they lose confidence. I write down important points and discuss them after the activity."

An important aspect of the teachers' feedback practice was the use of students' actual speaking performances as the basis for subsequent language improvement. By recording recurring problems during the activity, teachers were able to provide feedback that was closely connected to the language difficulties students had actually experienced rather than relying on general correction. Discussing both successful aspects and areas requiring improvement also gave students a clearer picture of their speaking performance. In this respect, feedback became a form of formative assessment that helped identify students' learning needs and informed the direction of subsequent instruction. The practice demonstrates that teachers used students' performance during VR activities not only to evaluate learning outcomes but also to identify opportunities for further language development.

Observation findings supported these statements. Teachers carefully monitored students' speaking performances, taking notes on common pronunciation, vocabulary, grammatical, and fluency issues. Feedback sessions emphasized both strengths and areas for improvement, enabling students to reflect on their communication without interrupting the natural flow of interaction.

Overall, the findings demonstrate that teachers assumed dynamic and interconnected roles throughout VR-based speaking instruction. They functioned not only as instructors but also as facilitators of learning, motivators, technological guides, classroom managers, and providers of formative feedback. These multiple roles ensured that VR technology served as a meaningful pedagogical resource rather than merely a technological novelty, supporting students' communicative competence in authentic learning contexts.

Teachers Experienced Both Challenges and Opportunities in Integrating VR-Based Audiovisual Media

Participants consistently emphasized that implementing VR-based audiovisual media involved more than simply introducing new technology into the classroom. Their experiences reflected continuous efforts to balance instructional goals with the realities of limited technological resources, classroom dynamics, and students' learning needs. At the same time, teachers recognized that VR created valuable opportunities to develop more engaging and meaningful speaking activities. The findings indicated that the integration process was shaped by both contextual challenges and pedagogical benefits experienced by teachers during classroom implementation.

One of the main challenges experienced by the participants was the limited availability of technological facilities. Although teachers considered VR an effective medium for supporting speaking instruction, the number of available VR devices was insufficient for all students to use simultaneously. This condition required teachers to carefully organize classroom activities so that students who were waiting for their turn remained actively involved in the learning process.
R1 explained:

> "We only have a limited number of VR devices, so students need to take turns. While some students use the VR, the others prepare their speaking tasks or discuss the topic with their partners."

Similarly, R2 stated:

> "The biggest challenge is managing the time because not all students can use the VR at the same time. The teacher needs to prepare other activities so students do not just wait."

This experience points to a broader issue concerning teachers' readiness to incorporate emerging technologies into language instruction. The use of VR introduced additional responsibilities that were not necessarily present in conventional speaking lessons, such as evaluating the suitability of virtual content, preparing the equipment, and anticipating technical disruptions. Consequently, teachers needed to combine their knowledge of English pedagogy with practical technological skills in order to make informed decisions during lesson implementation. This situation also suggests that familiarity with the operation of VR devices does not automatically ensure effective classroom integration. Teachers must understand how the technology can be incorporated into meaningful learning activities and how its features can contribute to the intended speaking outcomes. Therefore, the challenge of technological adaptation reflects the need for continuous professional development that equips teachers with both digital competence and pedagogical knowledge for technology-enhanced language teaching.

In addition to limited equipment, teachers also experienced challenges related to technological competence and adaptation. Although the participants were able to operate VR-based audiovisual media, they acknowledged that effective integration required not only technical skills but also the ability to connect technology with appropriate teaching strategies. Teachers needed to prepare the devices, select suitable VR content, anticipate possible technical problems, and ensure that the technology remained connected to the speaking objectives.
R3 described this experience:

> "Using VR is interesting, but teachers also need to learn how to manage it. Sometimes the problem is not the lesson itself, but the technical aspects. We need to know what to do when something does not work."

R2 added:

> ″Teachers need more training because technology continues to develop. Knowing how to use the device is different from knowing how to use it effectively for learning.″

R3 and R2's comments reveal that the challenge of VR integration extended beyond operating the equipment itself. Teachers were required to develop the ability to make immediate decisions when technical problems occurred while simultaneously preserving the continuity of instruction. The additional preparation required for VR use also suggests that integrating this technology demanded a higher level of teacher readiness than conventional teaching media. More importantly, the participants' emphasis on training indicates that technological competence should be viewed as an ongoing professional learning process, particularly because digital tools and their classroom applications continue to evolve.

Observation data showed that teachers spent additional preparation time before lessons to check the VR equipment and ensure that the audiovisual materials could function properly. When technical difficulties occurred, teachers immediately provided assistance while attempting to maintain students' attention toward the speaking tasks. These findings indicate that teachers' technological readiness played an important role in determining the effectiveness of VR implementation.

Despite these challenges, the participants highlighted several opportunities provided by VR-based audiovisual media, particularly in creating authentic and meaningful speaking experiences. Teachers perceived that VR enabled students to access situations that were difficult to present through conventional classroom activities. The immersive environments provided students with visual and contextual support, allowing them to generate ideas more easily and express their thoughts with greater confidence.

R1 explained:

> ″Before using VR, some students usually say that they do not know what to talk about. After seeing the virtual environment, they have more ideas because they can describe what they actually see."

Similarly, R3 stated:

> ″VR helps students imagine real situations. They feel like they are experiencing the place, so they become more interested in speaking.″

The participants' experiences suggest that VR provided a richer source of communicative content than activities in which students were expected to produce ideas from limited or decontextualized materials. The presence of specific objects, places, and situations within the virtual environment gave students multiple points of reference for developing their responses. This may explain why students were able to sustain discussions more readily and participate in a wider range of interactions. Moreover, the realistic context appeared to give speaking tasks a clearer

communicative purpose, as students were responding to situations that they could observe rather than simply completing language exercises. Hence, VR offered pedagogical value by enriching the content available for speaking and creating a stronger connection between classroom language practice and real-world communication.

These perceptions were supported by classroom observations. Students demonstrated higher levels of participation during VR-based activities by discussing what they observed, asking questions, and sharing opinions with their classmates. Compared with traditional speaking activities, students appeared more willing to communicate because the virtual environment provided a concrete reference for developing their responses.

The teachers also identified increased student motivation and confidence as important benefits of VR integration. According to the participants, students who were usually reluctant to speak became more involved because the VR activities created an enjoyable and less intimidating learning atmosphere.

R2 explained:

> "Students are usually more excited when they know they will use VR. Even students who are quiet become curious and want to participate because the activity feels different from usual lessons."

R2's comment highlights the influence of novelty and curiosity on students' engagement with speaking activities. The introduction of VR appeared to create a different classroom experience that attracted students' attention and encouraged even less active learners to become involved in the task. This suggests that the motivational value of VR was partly associated with its ability to break the routine of conventional classroom instruction and create a stronger sense of interest in the learning activity. However, the importance of this finding lies not simply in students being excited about the technology, but in how that initial interest was directed toward language use. When curiosity about the VR experience was connected to collaborative discussion and speaking tasks, students' engagement became part of the learning process rather than remaining focused on the technology itself.

Observation findings reflected this change in student engagement. During speaking tasks, students actively collaborated with peers, used English to discuss the virtual scenarios, and showed greater willingness to perform in front of the class. Teachers also noticed that students produced more spontaneous responses rather than relying only on memorized sentences.

Overall, the findings demonstrate that teachers experienced VR integration as a process involving both challenges and opportunities. While limited technological resources and the need for continuous technological development presented significant obstacles, teachers perceived VR-based audiovisual media as a valuable tool for enriching speaking instruction. The technology supported more authentic communication, encouraged student participation, and created learning experiences that were difficult to achieve through conventional classroom practices alone.

Discussion

The findings of this study indicate that the integration of Virtual Reality (VR)-based audiovisual media in EFL speaking instruction should not be understood merely as the adoption of advanced technology, but as a process of pedagogical transformation in which teachers

actively construct meaningful learning experiences. Although previous studies have highlighted the potential of VR in improving students' motivation, reducing speaking anxiety, and providing immersive learning environments, the present study demonstrates that these benefits emerge through teachers' instructional mediation. In other words, VR does not automatically create effective speaking instruction; rather, its educational value depends on how teachers interpret technological affordances, design learning activities, and connect immersive experiences with students' communicative needs.

The first important finding concerns teachers' strategies in integrating VR through preparation, immersive exploration, speaking interaction, and reflection. This instructional sequence reflects the principles of Experiential Learning Theory proposed by Kolb (2014), which emphasizes that meaningful learning develops through a cycle of concrete experience, reflective observation, abstract conceptualization, and active experimentation. In this study, VR provided students with concrete experiences by exposing them to simulated environments that represented real-world communication contexts. However, the findings reveal that the immersive experience itself was not sufficient to develop speaking competence. The teachers' instructional design was the factor that transformed VR exposure into a meaningful learning process. Through vocabulary preparation before VR activities, guided interaction during exploration, and reflective feedback after speaking performances, teachers completed the experiential learning cycle and enabled students to connect virtual experiences with language production.

This finding supports recent research suggesting that immersive technologies contribute to language learning when learners actively engage in contextualized tasks rather than simply consume digital content (Lee et al., 2024; Ngo & To, 2025). Previous VR studies have generally emphasized the effectiveness of immersive environments in increasing engagement and providing authentic contexts. However, this study extends those findings by revealing the pedagogical process behind successful VR implementation. The authenticity of learning experiences does not emerge solely from the realism of the virtual environment; instead, it is constructed through teachers' ability to organize meaningful communicative activities around that environment. Therefore, the present study contributes to VR-based language learning research by positioning teacher instructional design as a central mechanism that converts technological experiences into speaking development opportunities.

The findings also demonstrate that VR-supported speaking instruction reflects the principles of Situated Learning Theory proposed by Lave and Wenger (1991). According to this perspective, learning occurs through participation in meaningful social and contextual activities rather than through isolated knowledge transmission. In this study, VR created simulated situations that allowed students to practice English within contexts resembling real-life communication. Students were able to describe places, express opinions, and participate in role-play activities because the virtual environments provided concrete references for interaction. Nevertheless, the findings indicate that contextual learning was not created by VR alone. Teachers played an essential role in guiding students' participation through questioning, scaffolding, collaborative tasks, and feedback.

This finding provides a deeper understanding of previous research that has highlighted the importance of authenticity in VR-based learning environments. While earlier studies have reported that VR can increase learners' engagement by providing realistic situations (Chasokela, 2025; Papadopoulou et al., 2024), the present study reveals that authenticity is a socially constructed process involving both technological environments and teacher mediation. The

teachers' facilitative roles enabled students to move from observing virtual situations to actively participating in communication practices. Thus, this study extends Situated Learning Theory in the context of immersive language learning by demonstrating that teachers function as mediators who connect virtual contexts with actual language use.

Another significant finding relates to teachers' technological competence during VR implementation. The participants' experiences show that effective VR integration required more than the ability to operate technological devices. Teachers needed to select appropriate VR materials, align activities with speaking objectives, anticipate technical difficulties, manage classroom interaction, and provide pedagogical support throughout the learning process. This finding is consistent with the Technological Pedagogical Content Knowledge (TPACK) framework, which argues that meaningful technology integration occurs when teachers successfully combine technological knowledge, pedagogical knowledge, and content knowledge (Koehler & Mishra, 2005).

The present study extends previous discussions on teacher digital competence by demonstrating that VR competence is not merely technical proficiency but involves continuous pedagogical decision-making. Previous research has often measured teachers' technology readiness based on their ability to use digital tools (Koehler & Mishra, 2005; Ramanair & Rethinasamy, 2018; Viberg et al., 2020). However, the findings of this study suggest that effective VR implementation requires teachers to become instructional designers who determine how, when, and why technology should be used to achieve learning objectives. Therefore, teacher professional development for VR integration should not focus only on operational training but also on pedagogical strategies for designing immersive language learning experiences.

The challenges experienced by teachers further highlight the importance of contextual factors in technology integration. Limited VR devices, technical difficulties, and restricted technological infrastructure influenced how teachers organized classroom activities. However, the findings demonstrate that these limitations did not prevent meaningful VR implementation because teachers developed adaptive strategies, including group rotation, collaborative speaking tasks, and alternative activities for students waiting to use the devices. This phenomenon suggests that teacher agency plays an important role in overcoming technological constraints.

This finding contributes to previous technology integration research by showing that successful implementation in resource-limited contexts depends not only on technological availability but also on teachers' adaptability and instructional creativity. While previous studies have often identified infrastructure as a major condition for successful technology adoption (Teeroovengadum et al., 2017; Wong & Li, 2025), the present study reveals that pedagogical flexibility can function as a mediating factor that allows innovative practices to continue despite limited resources. Thus, institutional support remains necessary, but teacher agency represents a crucial element in sustaining technology-enhanced learning.

Furthermore, the findings indicate that VR-based audiovisual media supported students' motivation, confidence, and willingness to communicate. These improvements occurred because VR reduced students' dependence on abstract imagination and provided visual and contextual support for generating speaking ideas. Students were able to discuss situations based on what they experienced rather than relying only on textbook examples or memorized dialogues. This finding aligns with recent studies reporting that immersive technologies can increase learner engagement and reduce psychological barriers in foreign language speaking activities (Ai et al., 2025; Shi et al., 2024).

However, this study extends previous findings by demonstrating that students' increased confidence was not produced by VR technology alone. Rather, confidence developed through the interaction between immersive experiences and teachers' motivational support, classroom management, and formative feedback. The teachers' encouragement created a psychologically supportive environment in which students were willing to experiment with English despite making linguistic errors. Therefore, the present study highlights teacher mediation as the mechanism through which VR influences students' affective and communicative development.

Overall, this study proposes that VR integration in EFL speaking instruction should be conceptualized as teacher-mediated immersive learning. The findings demonstrate that Experiential Learning Theory explains how VR provides meaningful experiences, Situated Learning Theory explains how immersive contexts support authentic communication, and TPACK explains how teachers transform technological resources into pedagogical practices. By connecting these theoretical perspectives, this study extends previous VR research that has primarily focused on student outcomes by revealing the instructional processes through which teachers make immersive technology educationally meaningful.

The central contribution of this study lies in showing that the success of VR-based speaking instruction is determined not by the sophistication of the technology itself, but by the interaction between technological affordances, teacher agency, pedagogical knowledge, and contextual adaptation. Particularly in resource-constrained EFL settings, teachers' ability to mediate technology becomes the key factor that transforms VR from a digital innovation into a meaningful tool for developing students' communicative competence.

CONCLUSION

This study demonstrates that the integration of Virtual Reality (VR)-based audiovisual media in EFL speaking instruction should be understood as a teacher-mediated pedagogical process rather than a technology-driven innovation. By synthesizing the findings with Experiential Learning Theory, Situated Learning Theory, and the TPACK framework, this study reveals that the educational value of VR emerges through teachers' ability to transform immersive technological experiences into meaningful communicative learning opportunities. Rather than functioning as an independent instructional solution, VR becomes effective only when teachers strategically design learning activities, provide pedagogical scaffolding, facilitate interaction, and adapt instruction to the realities of the classroom.

The novelty of this study lies in its conceptualization of teacher-mediated immersive learning, which positions teachers as the central mechanism linking technological affordances with students' speaking development. While previous studies have predominantly emphasized the influence of VR on students' motivation, engagement, or speaking performance, this study extends the existing literature by explaining *how* these outcomes are pedagogically achieved. Specifically, it shows that teachers' instructional design, professional judgment, and adaptive practices constitute the critical factors that transform immersive technology into meaningful language learning experiences, particularly in resource-constrained EFL contexts.

These findings contribute theoretically by integrating experiential learning, situated learning, and TPACK into a coherent explanation of VR-supported speaking instruction, highlighting teacher agency as the connecting element among these perspectives. Practically, the study suggests that successful VR implementation requires professional development that

emphasizes pedagogical competence alongside technological skills, as well as institutional support that enables teachers to adapt immersive technologies to diverse classroom conditions.

This study was conducted in a single educational setting with a limited number of participants; therefore, the findings should be interpreted within this context. Future research is encouraged to examine teacher-mediated immersive learning across different educational levels, institutional contexts, and technological environments, while also incorporating students' perspectives and longitudinal evidence to further validate and refine the proposed conceptual framework. Future studies may also employ mixed-method or experimental designs to examine more systematically the relationship between teacher-mediated VR practices and students' speaking development. In particular, research could investigate how different patterns of teacher intervention influence students' fluency, accuracy, confidence, and willingness to communicate over time. Such investigations would provide a broader basis for determining the sustainability and transferability of teacher-mediated VR integration and would contribute to a more comprehensive understanding of how immersive technologies can be effectively implemented in diverse EFL contexts

REFERENCES

Ahmadi, M. R. (2018). *The use of technology in English language learning: A literature review*.

Ai, Y., Hu, Y., & Zhao, W. (2025). Interactive learning: harnessing technology to alleviate foreign language anxiety in foreign literature education. *Interactive Learning Environments*, *33*(3), 2440–2459.

Almusaed, A., Almssad, A., & Yitmen, I. (2025). Qualitative Data Collection and Management. In *Practice of Research Methodology in Civil Engineering and Architecture: A Comprehensive Guide* (pp. 417–454). Springer.

Amir, H. S., & Rustam, U. (2025). The role of technology in English language learning in the digital era. *Lingeduca: Journal of Language and Education Studies*, *4*(1), 1–8.

Chasokela, D. (2025). Investigating the role of virtual reality to support student'engagement, spatial awareness and problem-solving skills in engineering education. *International Journal of Instruction*, *18*(3), 613–636.

Clarke, V., & Braun, V. (2017). Thematic analysis. *The Journal of Positive Psychology*, *12*(3), 297–298.

Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications.

Farooq, M. U. (2015). Creating a Communicative Language Teaching Environment for Improving Students' Communicative Competence at EFL/EAP University Level. *International Education Studies*, *8*(4), 179–191.

Huang, X., Zou, D., Cheng, G., & Xie, H. (2021). A systematic review of AR and VR enhanced language learning. *Sustainability (Switzerland)*, *13*(9), 1–28. https://doi.org/10.3390/su13094639

Koehler, M. J., & Mishra, P. (2005). What happens when teachers design educational technology? The development of technological pedagogical content knowledge. *Journal of Educational Computing Research*, *32*(2), 131–152.

Kolb, D. A. (2014). *Experiential learning: Experience as the source of learning and development*. FT press.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge

university press.

Lee, S.-M., Yang, Z., & Wu, J. G. (2024). Live, play, and learn: Language learner engagement in the immersive VR environment. *Education and Information Technologies*, *29*(9), 10529–10550.

Lincoln, Y. S., & Guba, E. G. (1982). Establishing Dependability and Confirmability in Naturalistic Inquiry Through an Audit. *American Educational Research Association Annual Meeting*.

Medel, D., Reguant, M., Cemeli, T., Jiménez Herrera, M., Campoy, C., Bonet, A., Sanromà-Ortíz, M., & Roca, J. (2024). Analysis of Knowledge and Satisfaction in Virtual Clinical Simulation among Nursing Students: A Mixed Study. *Nursing Reports*, *14*(2), 1067–1078. https://doi.org/10.3390/nursrep14020081

Ngo, N. T. D., & To, T. K. O. (2025). The role immersive technology in creating rich affordance environment for ELT. *International Journal of TESOL & Education*, *5*(3), 39–59.

Papadopoulou, A., Mystakidis, S., & Tsinakos, A. (2024). Immersive storytelling in social virtual reality for human-centered learning about sensitive historical events. *Information*, *15*(5), 244.

Procel, G. J. O., Medina, M. L. F., Sotomayor, D. J., & Sanchez, M. A. (2024). Using technology in English teaching. *Journal of Environmental Research and Public Health*, *17*(9), 9.

Ramanair, J., & Rethinasamy, S. (2018). Measuring teachers' readiness to use technology. *Journal of IT in Asia*, *8*(1), 7–13.

Shadiev, R., Feng, Y., Zhussupova, R., & Altinay, F. (2026). Effects of speech-enabled corrective feedback technology on EFL speaking skills, anxiety and confidence. *Computer Assisted Language Learning*, *39*(4), 878–914.

Shi, J., Sitthiworachart, J., & Hong, J.-C. (2024). Supporting project-based learning for students' oral English skill and engagement with immersive virtual reality. *Education and Information Technologies*, *29*(11), 14127–14150.

Tajik, O., Golzar, J., & Noor, S. (2025). Purposive sampling. *International Journal of Education & Language Studies*, 1–9.

Teeroovengadum, V., Heeraman, N., & Jugurnath, B. (2017). Examining the antecedents of ICT adoption in education using an extended technology acceptance model (TAM). *International Journal of Education and Development Using ICT*, *13*(3).

Toro, V., Camacho-Minuche, G., Pinza-Tapia, E., & Paredes, F. (2018). The Use of the Communicative Language Teaching Approach to Improve Students' Oral Skills. *English Language Teaching*, *12*(1), 110. https://doi.org/10.5539/elt.v12n1p110

Viberg, O., Mavroudi, A., Khalil, M., & Bälter, O. (2020). Validating an instrument to measure teachers' preparedness to use digital technology in their teaching. *Nordic Journal of Digital Literacy*, *15*(1), 38–54.

Ward, T., Jenab, K., Ortega-Moody, J., Barari, G., & Molina Acosta, L. D. C. (2025). Virtual Classrooms, Real Impact: A Framework for Introducing Virtual Reality to K–12 STEM Learning Based on Best Practices. *Applied Sciences (Switzerland)*, *15*(21), 1–15. https://doi.org/10.3390/app152111356

Wong, J. M. S., & Li, K. C. (2025). Technology-Enabled institutional readiness for agile-blended learning: a framework for educational innovation. *SN Computer Science*, *6*(3), 279.

Wright, W., Allen, E., & Thompson, L. (2025). *Applied Communication Strategies for Building*

Functional Speaking Skills in Modern Language Education.

Yan, W., Lowell, V. L., & Yang, L. (2024). Developing English language learners' speaking skills through applying a situated learning approach in VR-enhanced learning experiences. *Virtual Reality*, *28*(4). https://doi.org/10.1007/s10055-024-01061-5

Yu, X. (2022). The English as a foreign language learners' psychological and emotional perceptions on technology integration in language classrooms. *Frontiers in Psychology*, *13*, 906750.