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Integrating Digital Pedagogy and Multimodal Literacies in Teaching EFL Speaking: A State of the Art Review

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Abstract

Digital technologies and multimodal communication continue changing the way EFL speaking is learned and taught. This contemporary review attempts to collate recent literature in digital pedagogy and multimodal literacies to determine the extent to which new technologies assist in EFL speaking skills development. The literature review indicates that mobile applications, AI feedback mechanisms, and online speaking classrooms remove the barriers to the development of speaking skills as learners are provided with the required autonomy to work on their speaking fluency and confidence. The literature also indicates that learners are more motivated to use voice, gestures, and images in presentations to achieve a greater purpose and meaning in presentations designed for digital storytelling and videos. The literature indicates that EFL speaking pedagogy has a number of gaps, including the assessment of multimodal speaking, the feedback AI, and the pedagogical practices that are digital and multimodal. This review has identified the gaps and aims to support efforts to address the gaps.Keywords: digital pedagogy, EFL speaking, multimodal literacies, literature review.
Keywords: *digital pedagogy, EFL speaking, multimodal literacies, literature review*

Introduction

Recent changes in technology make instructions and information more understandable and also make learners interact with information in new ways in modern language learning classrooms. Danilov et al. (2020), Vu et al. (2021), and Ceken and Taskin (2022) suggest that digital learning incorporates integrated use of visual and verbal information, which is difficult for teachers who focus only on worded instructions and speaking. In a similar manner, Hagoort and Ozyurek (2024), Huang (2024), and Drijvers and Holler (2022) justify that modern communication has always used more than one mode, such as gesture, image, and sound, combined with language to create a particular abbreviated sense in a single event of communication.

These changes indicate a widening gap between teachers' use of speaking in EFL classrooms and the speaking skills that learners need to be able to communicate effectively within the digital context. There are many learners who experience difficulties in real time speaking while processing, planning, and self-monitoring (Himmah et al, 2025; Riandini, 2025; Albarqi, 2024; Alaraj, 2024). Omar (2023), Kunitz et al (2022), and Bulbula et al. (2021) observe that there is still not enough meaningful speaking and interaction in classroom practices. This shows the need to rethink the way speaking is taught.

It has been established that digital resources are beneficial to learners' speaking skills. In studies done by Pratama (2025), Zhang (2024), and Oraz et al. (2024), for instance, learners' reflective learning and fluency were enhanced by using voice blogs. Moreover, tech-aided speaking activities, according to Pramesti et al. (2025), Sari et al.

(2025), and Handikaningtyas et al. (2025), are able to improve learners' self-confidence and class participation. In mobile learning contexts, there is evidence provided by Metruk (2024), Hương et al. (2025), and Seemab et al. (2024) that considers the alternative mobility and ease the apps allow learners to access and work on their pronunciation. In that regard, enhanced involvement from students along with self-reliance are characteristics of mobile learning platforms, as indicated by Thilagam et al. (2025), Nguyen (2023), Diary et al. (2023), and Nishonova (2025). Research about online communication continues to confirm these benefits. Tran et al. (2024), Akbar (2024), and Zhou (2023) confirmed that the benefits of online communication for the promotion of speaking fluency and listening comprehension occur due to the authentic communicative exchange.

Research on scholarship regarding multimodal learning continues on the other side. Different authors have argued evidence differently. Ahmed et al. (2025) argues evidence in a way that is similar to that of Cheong et al. (2023) and Prastyo et al. (2025), where they see meaning as a by-product of defect modes interacting. Ching et al (2024), Tymoshchuk (2025). (2025) affirm improvements regarding one's ability to express gratitude and this is further supported by Li (2025), Long (2025), Pinar (2024), Kosel et al (2024) who elaborated on emotional engagement and deeper meaning construction with multimodal tasks. Zhang and Jing (2025), Pramesti et al. (2025), Pakpahan et al (2025), Suseno et al (2024) improvements to clarity of expression and confidence are explained having to do with the added images,gestures, and narration by learners (2025). Also Jia and Lu (2025) as well as Sok and Shin (2025) document that technology-supported tasks enrich interaction and promote more spontaneous oral production.

While some of these studies have been completed, some limitations appear to be unchanged. Shiu (2025) and Krisbiantoro & Ashari (2024) point out how some of the studies on technology do not integrate with some of the pedagogy. Jalaluddin (2025) and Su (2023) also point out how educators do not incorporate digital technology into their practice with the understanding of how it changes the learning. In multimodality, some of the work being done by Bocharova (2025), Hadizadeh (2025), and Rahmanu & Molnár (2024) has focused on the various studies on writing and has rarely discussed the multimodal component of speaking.

Research findings on providing feedback through artificial intelligence are still inconsistent. Mohammadkarimi (2024) and Almusharraf et al. (2024) state that while there were gains in the accuracy of pronunciation, other studies suggested the need for more sustained and controlled research efforts. Zhang (2025) and Soroko & Shymon (2025) further point out the discrepancy in the preparedness of the educators, which is particularly true in the cases where the technology is limited. These gaps point out the importance of the need for an inclusive digital pedagogy and multimodal literacies to deal with the complex functions of teaching and speaking.

This paper investigates contemporary work on digital and multimodal approaches in EFL speaking instruction to address these gaps. This review attempts to outline recent advancements and to address conceptual and practical inconsistencies. This review also attempts to offer suggestions for future speaking instruction. This work is different in its attempt to integrate digital pedagogy and multimodal literacies, which are usually examined in isolation, and thus, provides a clearer view on the enhancement of speaking instruction in the contemporary digital context.

Method

This study utilized a conceptual review approach to analyze theoretical frameworks and empirical evidence found in peer-reviewed articles and conference papers published from 2019 to early 2025. This approach was deemed suitable for this study because the objective was to analyze the recent changes in digital pedagogy, multimodal literacies, and instructed technology speaking, as opposed to collecting primary data. The specified time range guaranteed that the most recent changes in the use of technology and multimodal communication in the context of EFL speaking were considered.

The materials used in this review consisted of articles obtained from a systematic search from Google Scholar, ERIC, ScienceDirect, and ResearchGate. The search was guided by the keywords "digital pedagogy," "multimodal literacies," "EFL speaking," "mobile-assisted language learning," "online speaking platforms," "feedback from artificial intelligence," and "multimodal communication." The selection criteria were studies that focused on speaking instruction, included digital or multimodal components, and contributed in a methodological or theoretical manner in line with the objectives of this review. In order to retain conceptual clarity, publications that addressed educational technology in speaking were excluded.

Inclusion criteria were applied to titles and abstracts to determine whether studies merited full-text review. Following selection, studies were grouped according to their area of focus: digital tools for speaking practice, mobile-assisted learning for production, online speaking interaction, multimodal task oral communication, and AI-supported speaking. These were the categories that framed the analysis.

The analysis of data resulted in a thematic synthesis. After a review of the studies, data were organized and were described in terms of recurrent ideas, conceptual frameworks, instances of theory in practice, methodological challenges, and gaps that warranted research. This process identified a thematic review that presented a new interpretation of the scholarship on the intersection of digital pedagogy, multimodal literacies, and the teaching of EFL speaking in the digital age.

Results

Assessing the given papers from 2019-2025 shows consistency and helps showcase specific attributes of digital pedagogy, along with the impact of multimodal literacies on the development of EFL speaking skills. This thematic synthesis captures the overarching patterns across the diverse settings and educational contexts. To facilitate explanation, the analysis yielded four thematic findings that encapsulate, in contemporary scholarship, how values, practices, and outcomes surrounding digital and multimodal approaches integrated into speaking pedagogy are understood. These findings are captured in the following thematic expressions:

Increased Chances for Oral Engagement Augmented by Technology

The findings reveal a an expansion of opportunities for the practice of speaking through the use of technologies like mobile applications, online speaking platforms and interactive voice responsive systems. There are a number of studies that document these findings illustrating the digital technologies created a flexible learning environment within which learners could engage in multiple iterations of oral practice at their own pace. This ultimately promoted greater familiarity with the spoken forms of the language and its use and reduced the anxiety that is associated with frequent face-to-face speaking interactions.

The data further suggests that learning digital environments provide a level of comfort and control for the learners. The mobile applications and other online platforms that provide practice activities allow learners to practice, record, and monitor their own speech, contributing to higher levels of confidence and fluency. The digital environment allow students to take even more chances and try new vocabulary and pronunciation that is more precise through frequent practice. All digital tools provide a space from anywhere and act as an environment that increases the amount and the quality of speech practice available.

Increased Interaction and Learner Agency in Mobile-Assisted and Online Settings

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Strengthening Meaning through Multimodal Speaking Tasks

A third point is that multimodal speaking tasks foster enhancement in learners' meaning-making activities. Students in activities like digital storytelling, video presentations, and multimodal project work, have to employ a variety of semiotic resources, such as voice and images, along with other forms of communication, like gesture, sound, and text. This change focuses learners' attention away from the mere reproducing of correct and appropriate forms of a particular linguistic item, to the construction of communication that is functional and expressive.

The data indicates that multimodal activities enable learners to better align their thoughts than they would in a monomodal context, as they were provided greater visual and contextual support than would traditionally be available. This situation allowed learners to use visual markers, and other means of communication, to rehearse planned speech, making the whole speaking activity more seamless. Also, more than other activities, it empowers learners to engage in the creation of content at a more profound level, as they have to integrate design and presentation with predetermined content. In general, it boosts learners' conceptual grasp and their ability to communicate that understanding meaningfully in spoken form.

Emerging but Inconsistent Role of Artificial Intelligence in Speaking Support

The last result relates to the incipient application of the artificial intelligence tool in speaking assistance. The study acknowledges the increasing interest in systems that provide automated feedback focusing on the elements of pronunciation, fluency,

vocabulary, and grammatical accuracy. Such systems are appreciated primarily because of the immediacy and the constancy of feedback, and many studies outline the subsequent improvements in the quality of learners' speech performances after the use of some applications adopting artificial intelligence.

On the other hand, the review also argues that the feedback provided by artificial intelligence systems, if at all, is often inconsistent. While artificial intelligence systems are not devoid of potential, it should be also acknowledged that they do not offer feedback that is sensitive to the overall discourse structure, contextual meaning, and usage in appropriate situations. Some of the systems constrict feedback to micro level inaccuracies and do not assist the learners to develop on the larger picture of communicative competence. The review also states that the artificial intelligence feedback systems are inconsistent for different tasks and for different learners in terms of their language proficiency.

As a result, the feedback from the systems is overall helpful, but there is no doubt that there are many gaps that need to be fixed in terms of research, including, but not limited to assessment validity, user experience, and the ways to incorporate these systems in pedagogical contexts.

Discussion

From these findings, it is possible to grasp the impact of digital pedagogy and multimodal literacies practices on EFL speaking skills. It results in a holistic understanding and helps explain the relations of these findings with other theories and studies. It helps to see if the findings are consistent with the literature, contribute to the literature, or create gaps in the literature.

The Role of Digital Pedagogy in Improving Speaking Skills

The first key finding is that digital tools increased the effectiveness of oral practice, a finding documented in the literature. Zhang (2024) and Jameel (2023) documented that learners are able to take on speaking tasks with greater ease and engagement when they are able to practice digitally, and when they have the ability to self-monitor, practice, and control the media. Their findings are in line with the understanding that learners are more willing to communicate in a digital environment, and that it also reduces their anxiety.

Mobil assisted learning has also been documented in other studies as stated by Liu et al. (2025), Dimas and Daulay (2025), as well as Agustina et al. (2025) who state that mobile apps help learner in practicing their English speaking accent as they get feedback and they get to practice speaking on their own. As Beatriz and Dack (2024), Rosita and Halimi (2023), and Sesa and Margana (2025) also stated, students get to improve their confidence as well as their fluency in speaking when they use mobile apps to practice speaking, get recordings of their speech, and are able to review and edit it in order to improve. This testifies how technology in teaching and learning helps students practice and improve on their own.

Findings on students' online interaction are also consistent with previous studies. Bahar and Dalimunte (2025), Iglesias and Tarazona (2025), and Tran et al. (2024) discovered that involved learners in virtual speaking exchange with multiple interlocutors that enhances their communicative flexibility in listening and responding. Similarly, in the Indonesian context, Rusanti and Wismadewi (2023) and Hanifah and Nainggolan (2021) studies showed that video speaking tasks in the classroom enhanced learners' willingness to speak when compared to the traditional classroom setting. This

evidence confirms the claim that learners with digital tools are able to communicate and interact more freely and meaningfully.

Multimodal Literacies Strengthen Meaning Making in Speaking Tasks

The second finding focusing on the impact of the use of several resources is also aligned with the field of study communication in the present mode of communication. The studies explain the production of meaning as the combination of several elements working together with the use of one element alone. These theories provide foundation to the current result in that the use of multiple resources require learners to use and integrate the visual, sound, and movement systems to communicate a message in a more elaborate way.

This interpretation is also supported in the published field. Some studies confirmed that the use of multiple resources in the classroom provide more attention to the learners on the task and that somehow produced motivation to the learners to communicate. Others have also provided evidence that the combination of pictures and movement storytelling assist learners to have more meaningful summarization of the oral message and have less nervousness in the tasks. These published patterns explain in detail the current finding that the multiple resources helped to focus and be more clear in what they expressed. There are many examples in the literature where digital storytelling is highlighted as an example of useful multimodal practice. Examples of the literature documents the positive effect of participating in digital storytelling on the structure of narratives and clarity as well as the confidence in speaking. Besides, the literature (e.g. Zhou and Goh) even reports that multimodal activities engage learners' in vocabulary internalization and in the coherent organization of their ideas. There is agreement on the conclusion that multimodal literacies enrich the process of meaning making in speaking instruction.

Melding Digital and Multimodal Approaches for Enhanced Oral Communication

The third finding of the review underscores the advantages of the combination of digital teaching methods and multimodal literacies. Such understanding is consistent with the work of Hadizadeh (2025) and Yuniarti and Yulian (2022) who state that digital tasks that are enhanced with multimodal elements and modalities are likely to promote spontaneous and interactive discourse. Quah and Ng (2021) and Perez (2022) also concluded that tasks involving technology and visual aids, along with audio narration and textual components, foster deeper engagement and promote genuine discourse. Such empirical evidence thus supports the review's claim that the integration of digital with multiple modalities (or forms) of communication enrich take communication to a higher level.

Additionally, research also shows the digital components also streamline the integration of multiple forms of expression. Hafour (2022) and Hwang et al . (2025) stated that in situations where speaking activities are supported by visual materials and recording tools, students are expected to create messages that are more coherent. Similarly, Wei and Fan (2022) and Hashim et al. (2023) observed that digitally supported learning activities containing images encouraged students to engage in more substantial interaction. This corroborates the fact that digital environments have the capacity to accommodate various types of expression and the development of innovative ideas.

Li and Wong (2023) and Hidayah et al. (2025) caution of some of the setbacks regarding Alignment & Design, even when considering all of the positive attributes.Technology-assisted speaking tasks, and speaking activities more generally,

suffer from being poorly aligned with principles of multimodal pedagogy, and as such, are ineffective. This is consistent with the present review, which concluded that there is still inconsistent integration of multimodal digital resources in the literature.

Continuing Issues Concerning Teacher Readiness, Modality Alignment, and AI Reliability

The final finding addresses the case which continues to influence the evolution of digital and multimodal speaking instruction. Teacher readiness continues to be one of the most common challenges, Shedding some light on some teachers' digital and multimodal practices, De and Molinero (2021), Tan et al. (2023), and Véliz and Campos (2023) identified a lack of training as one of the reasons. Contemporary digital pedagogy continues to lack the necessary training as highlighted in studies conducted by Zulkepli et al. (2024), Claros et al. (2023), and Kositchaivat (2025). The disparity in these works suggests it's time to focus on teacher training.

Also teacher readiness, there is extensive evidence on the challenges regarding modality alignment and system scalability. Ullah et al. has discussed persistent challenges on the integration of multiple modes and model stability in a live context.

(2025) and Wang et al. (2025). These challenges confirm the conclusion of the review suggesting the need for improvement of the multimodal digital systems in order to function effectively in various educational contexts.

Similarly, the literature on artificial intelligence evokes mixed results. In their studies, Toyama and Hori (2025), Ping and Tao (2025), Almusharraf et al. (2024), and Mirzayev (2024) reported improvements in pronunciation accuracy where learners made use of AI aided feedback. At the same time, some of the researchers exercised caution, arguing that the improvements may not be sustained over long periods of time. Ngo et al. (2023) also reported improvements, but these improvements call for more regulated and long-term studies. Such concerns support the current finding that the AI reliability on speaking instruction is still under construction.

Conclusion

This review has analyzed the literature on the role of digital pedagogy and multimodal literacies in EFL speaking skill development. Literature suggests that digital technologies are able to remove contextual boundaries of oral practice and enhance learner independence, communicative self-assurance, and fluency through repeated practice. At the same time, multimodal approaches to pedagogy and literacy keep the focus on meaning as learners are able to integrate and interact with the visual, auditory, and language channels to construct meaning in their speech. The only studies that dealt with the integration of both affordances of pedagogy and literacy focus on the development of learners' spontaneous, interactive and purposeful speech.

Needless to say, those studies had been much needed and the outcomes issued are quite valuable, but there are still some gaps to fill. To mention, the literature on assessment of speaking in a multimodal context is still limited, as are the outcomes on the use of devices powered by artificial intelligence in speaking assessment. There still remains a huge gap across the practitioners' communities in pedagogical content knowledge on the use of digital and multimodal pedagogies. It seems that there is broad room to expand the studies that focus on the use of digital and multimodal approaches in the practice of pedagogy in a variety of educational contexts.

Once again synthesizing recent scholarship, this particular review clarifies the conceptual and pedagogical understanding of the potential of digital and multimodal

frameworks to further EFL speaking development. Future studies will continue to clarify the theory and inform practice in the EFL classroom through the innovative use of digital tools. We recommend exploring the effectiveness and reliability of AI feedback systems and designing professional development courses to strengthen teachers' digital and multimodal skills. We encourage further research in the theoretical applications of digital tools in EFL classrooms.

References

Agustina, T., Hajimia, H., Yusran, G., Halawiyah, I., Farizi, Muh. I., & Ariawan, S. (2025). EFL Students' Perceptions and Experiences on the Utilization of Ling App in Learning Pronunciation. *Jurnal Pendidikan Progresif*, *15*(1), 659–670. https://doi.org/10.23960/jpp.v15i1.pp659-670

Ahmed, M. A., Mahamid, F., & Al-Hlio, G. (2025). Enhancing English Learning and Skill Development through Digital Storytelling and the Metaverse in Palestinian Media Education. *International Journal Online of Humanities*. https://doi.org/10.24113/ijohmn.v11i1.299

Akbar, J. (2024). Effectiveness of Online Learning Tools for Improving Speaking Skills in English Education. *Journal of Educational Studies*, *2*(2), 67–77. https://doi.org/10.58218/jes.v2i2.1137

Alaraj , M. M. (2024, October 10). *Effective Strategies to Overcome EFL Speaking Difficulties*. International Journal for Social Science and Human Research. https://doi.org/10.47191/ijsshr/v7-i10-14

Albarqi, G. (2024). Self-Monitoring Foci, Speed, and the Relationship with Pausing Behavior in an EFL Context. *Sage Open*, *14*(4). https://doi.org/10.1177/21582440241289985

Almusharraf, A., Aljasser, A., Mahdi, H. S., Al-Nofaie, H., & Ghobain, E. (2024). Exploring the effects of modality and variability on EFL learners' pronunciation of English diphthongs: a student perspective on HVPT implementation. *Humanities and Social Sciences Communications*, *11*(1). https://doi.org/10.1057/s41599-024-02632-2

Almusharraf, A., Mahdi, H. S., Al-Nofaie, H., & Aljasser, A. (2024). The effect of settings, educational level and tools on computer-assisted pronunciation training: A meta-analysis. Journal of Computer Assisted Learning. https://doi.org/10.1111/jcal.12974

Bahar, T., & Dalimunte, M. (2025). The Effect of "Free4Talk" Online Language Platform Usage on Enhancing University Students' Speaking English Skills. *International Journal of English and Applied Linguistics (IJEAL)*, *5*(1), 8–20. https://doi.org/10.47709/ijeal.v5i1.5736

Beatriz, N., & Dack, T. F. (2024). The effect of voice recording as a tool to improve speaking skills. *RUNAS. Journal of Education and Culture*, *5*(10), e240161–e240161. https://doi.org/10.46652/runas.v5i10.161

Bocharova, M. N. (2025). Multimodal methods of teaching writing in a foreign language in the context of the digital transformation of higher education. *Philology Theory & Practice*, *18*(2), 439–447. https://doi.org/10.30853/phil20250063

Bulbula, D. A., Bulti, T. A., & Sada, E. Y. (2021). EFL Teachers' Practices and Implementations of Speaking Activities in Ethiopian English Textbooks. *Education Research International*, *2021*, e8696278. https://doi.org/10.1155/2021/8696278

Cai, Y., Pan, Z., Han, S., Shao, P., & Liu, M. (2022). The Impact of Multimodal Communication on Learners' Experience in a Synchronous Online Environment: A Mixed-Methods Study. *Online Learning*, *26*(4). https://doi.org/10.24059/olj.v26i4.3448

Çeken, B., & Taşkın, N. (2022). Multimedia learning principles in different learning environments: a systematic review. *Smart Learning Environments*, *9*(1). https://doi.org/10.1186/s40561-022-00200-2

Ching, K., Oancea, A., & Erduran, S. (2024). Students' Meaning-Making of Nature of Science: Interaction Between Visual, Verbal, and Written Modes of Representation. *Science Education*. https://doi.org/10.1002/sce.21916

Claros, M. S. C., Sydorenko, T., Huntley, E., & Perez, M. M. (2023). Teachers' voices on multimodal input for second or foreign language learning. Language Teaching Research. https://doi.org/10.1177/13621688231216044

Danilov, A. V., Nekrasova, I. D., & Anyameluhor, N. (2020). Digitalization Trends in Education and Blended Learning. *International Journal of Criminology and Sociology*, *9*, 1062–1066. https://doi.org/10.6000/1929-4409.2020.09.121

De, K. K., & Molinero, V. M. (2021). The challenges of dynamic teacher training for a short English for academic purposes course when using multimodal digital platforms: a case study. EPrints Soton (University of Southampton), 69–74. https://doi.org/10.14705/rpnet.2021.54.1311

Diari, K. P. Y., Suwarna, S., & Suweta, I. M. (2023). Mobile Technology-Mediated Language Learning: A Quantitative Study to Unravel Language Learners' Achievement and Autonomy. *SCIEDU World Journal of English Language* , *13*(5), 354–354. https://doi.org/10.5430/wjel.v13n5p354

Dimas, & Daulay, E. (2025). Improving Students' Speaking Ability Through Loora As Mobile-Assisted Language Learning Application. *IDEAS: Journal on English Language Teaching and Learning, Linguistics and Literature*, *13*(1). https://doi.org/10.24256/ideas.v13i1.6335

Drijvers, L., & Holler, J. (2022). The multimodal facilitation effect in human communication. Psychonomic Bulletin & Review, 792–801. https://doi.org/10.3758/s13423-022-02178-x

Firmansyah, B. (2021). The Effectiveness Of Multimodal Approaches In Learning. *EDUTEC : Journal of Education and Technology*, *4*(3), 469–479. https://doi.org/10.29062/edu.v4i3.194

Hadizadeh, A. (2025). Exploring the Impact of Multimodal Language Learning Activities on oral Skill Development: A Study of In-Class Oral Speech, PowerPoint Presentations, Video, and Blog Projects in an International Context. *Journal of Language Research*, *9*(1), 52–72. https://doi.org/10.51726/jlr.1582727

Hafour, M. F. (2022). Interactive digital media assignments: effects on EFL learners' overall and micro-level oral language skills. *Computer Assisted Language Learning*, 1–33. https://doi.org/10.1080/09588221.2022.2067180

Hagoort, P., & Özyürek, A. (2024). Extending the Architecture of Language From a Multimodal Perspective. Topics in Cognitive Science, 17(4), 803–972. https://doi.org/10.1111/tops.12728

Handikaningtyas, T., Kuswandi, D., & Wedi, A. (2025). Gamification-Based Mobile Learning Assisted Language Learning for Self-Directed Speaking Skill Improvement. *Akademika*, *14*(01), 12–34. https://doi.org/10.34005/ak.v14i01.4312

Hanifah, & Nainggolan, E. E. (2021). University Students' Willingness to Communicate in Virtual Classroom. *Ahmad Dahlan Journal of English Studies*, *8*(1 (2021)), 68. https://doi.org/10.26555/adjes.v8i1.20108

Hashim, H., Jamal, M. F., Esa, I., & Rafiq, K. R. M. (2023). TEALL: Technology-Enhanced Active Language Learning. *Creative Education*, *14*(7), 1453–1462. https://doi.org/10.4236/ce.2023.147092

Hidayah, J., Prihantoro, P., Apriani, E., Polisda, Y., Arnanda, F. S., & Oktavia, N. (2025). Facilitating Students' Multimodal Competence Development in Technology-Supported Speaking Class Through Multiliteracies Pedagogy. Journal of English Education and Teaching, 9(1), 172–189. https://doi.org/10.33369/jeet.9.1.172-189

Himmah, N., Mahdavi, M., & Bakhtiari, S. (2025). Speaking Problems Faced By Efl Learners In Individual Presentation. *Journal of Language, Literature, and Educational Research.*, *2*(1), 59–70. https://doi.org/10.37251/jolle.v2i1.1837

Huang, C. (2024). Designing A Distance Learning System for English Reading by Applying Multimodal Discourse Analysis Theory. Journal of Electrical Systems, 20(3s), 1799–1809. https://doi.org/10.52783/jes.1719

Hương, L. P. H., Diem, T. T. P., & Van, N. P. T. (2025). EFL UNIVERSITY STUDENTS' SELF-STUDY OF ENGLISH SPEAKING SKILL ON THE LANGUAGE LEARNING APPLICATION "CAKE." *Hue University Journal of Science: Social Sciences and Humanities*, *134*(6B), 51–66. https://doi.org/10.26459/hueunijssh.v134i6b.7783

Hwang, G., Fathi, J., & Rahimi, M. (2025). Fostering EFL Learners' Speaking Skills and Flow Experience With Video-Dubbing Tasks: A Flow Theory Perspective. *Journal of Computer Assisted Learning*, *41*(2). https://doi.org/10.1111/jcal.13120

Iglesias, M., & Tarazona, C. (2025). NEW INSIGHTS INTO PEER FEEDBACK IN VIRTUAL LANGUAGE EXCHANGES. *LLT Journal a Journal on Language and Language Teaching*, *28*(1), 20–36. https://doi.org/10.24071/llt.v28i1.10642

Isnaini, R. A., & Kasiyarno . (2024). Digital Storytelling for English Teaching at Alam Nurul Islam Integrated Islamic Junior High School Yogyakarta. *International Journal of Research and Innovation in Social Science*, *VIII*(III), 2021–2032. https://doi.org/10.47772/ijriss.2024.803140

Jaemsai, P., & Sukying, A. (2025). Enhancing Vocabulary Knowledge Through Multimodal Learning in Thai Primary Classrooms. *Journal of Education and Learning*, *15*(1), 137. https://doi.org/10.5539/jel.v15n1p137

Jalaluddin, M. (2025). Exploring the Impact of Digital Tools on Linguistic Competence: A New Dimension in English Language Teaching Methodologies. *British Journal of Applied Linguistics*, *5*(1), 29–34. https://doi.org/10.32996/jgcs.2025.5.1.3

Jameel, A. S. (2023). The Role of Self-Monitoring Strategies in Developing Students' Speaking Performances via Google Workspace. *Dirasat Human and Social Sciences*, *50*(6), 25–34. https://doi.org/10.35516/hum.v50i6.7032

Jia, S., & Lu, Z. (2025). Enhancing EFL Oral Production through Mobile-Assisted Task-Based Language Teaching: A Study in Effectiveness. *Journal of Information Technology Education Research*, *24*, 012–012. https://doi.org/10.28945/5482

Khadka, T. B. (2025). Integrating Verbal and Visual Signs in Meaning Making: A Semiotic Analysis. *Spectrum of Humanities and Social Sciences*, *1*(1), 147–158. https://doi.org/10.3126/shss.v1i1.79838

Kosel, C., Michel, S., Seidel, T., & Foerster, M. (2024). Exploring the dynamic interplay of cognitive load and emotional arousal by using multimodal measurements: Correlation of pupil diameter and emotional arousal in emotionally engaging tasks. ArXiv (Cornell University). https://doi.org/10.48550/arxiv.2403.00366

Kositchaivat, S. (2025). The Effects of Task-Based Learning and Graphic Organizer Techniques on the Developing Student Teacher Professional Competency in Listening and Speaking Skills. LEARN Journal: Language Education and Acquisition Research Network, 18(1), 859–882. https://doi.org/10.70730/nesc6564

Krisbiantoro, B., & Ashari, I. A. (2024). EVALUATING THE SAMR MODEL FOR ENHANCING ICT INTEGRATION IN ENGLISH LANGUAGE TEACHING AT THE TERTIARY LEVEL A SYSTEMATIC LITERATURE REVIEW. *FRASA*, *5*(2), 108–115. https://doi.org/10.47701/frasa.v5i2.4027

Kudaibergen, A. I., & Turebayeva, Sh. M. (2025). Digital Storytelling as an innovation to enhance college students' speaking skills in English language. *Bulletin of the Karaganda University Pedagogy Series*, *11930*(3), 60–70. https://doi.org/10.31489/2025ped3/60-70

Kunitz, S., Berggren, J., Haglind, M., & Löfquist, A. (2022). Getting Students to Talk: A Practice-Based Study on the Design and Implementation of Problem-Solving Tasks in the EFL Classroom. *Languages*, *7*(2), 75. https://doi.org/10.3390/languages7020075

Li, M. (2025). Impact of multimodal learning environments on cognitive and emotional development in students. *Journal of Computational Methods in Sciences and Engineering*. https://doi.org/10.1177/14727978251363052

Lin, Y.-L. (2020). A helping hand for thinking and speaking: Effects of gesturing and task planning on second language narrative discourse. *System*, *91*, 102243. https://doi.org/10.1016/j.system.2020.102243

Liu, F., Orkphol, K., Pannurat, N., Sooknuan, T., Muangpool, T., Kuankid, S., & Phothisonothai, M. (2025). Intelligent Mobile-Assisted Language Learning: A Deep Learning Approach for Pronunciation Analysis and Personalized Feedback. *Inventions*, *10*(4), 46–46. https://doi.org/10.3390/inventions10040046

Long, J. (2025). Multimodal Language Literacy Approaches in Enhancing Reading Engagement of University Student in Jiangmen City, China. *World Journal of Educational Research*, *12*(3), p44. https://doi.org/10.22158/wjer.v12n3p44

Metruk, R. (2024). Mobile-assisted language learning and pronunciation instruction: A systematic literature review. *Education and Information Technologies*. https://doi.org/10.1007/s10639-024-12453-0

Mirzayev, E. (2024). Enhancing Pronunciation Skills through the Eclectic Method in University-Level English Teaching. EuroGlobal Journal of Linguistics and Language Education, 1(2), 139–148. https://doi.org/10.69760/egjlle.2024.046

Mohammadkarimi, E. (2024). EXPLORING THE USE OF ARTIFICIAL INTELLIGENCE IN PROMOTING ENGLISH LANGUAGE PRONUNCIATION SKILLS. *LLT Journal: A Journal on Language and Language Teaching*, *27*(1), 98–115. https://doi.org/10.24071/llt.v27i1.8151

Ngo, T. T.-N., Chen, H. H.-J., & Lai, K. K.-W. (2023). The effectiveness of automatic speech recognition in ESL/EFL pronunciation: A meta-analysis. ReCALL, 36(1), 1–18. https://doi.org/10.1017/s0958344023000113

Nguyen, T. L. (2023). Promoting Learner Autonomy in Learning English Listening Skills through Mobile-Assisted Applications. *AsiaCALL Online Journal*, *14*(2), 118–139. https://doi.org/10.54855/acoj.231428

Nishonova, M. A. (2025). Advantages of Using Mobile Applications and Platforms for The Effective Organization of Independent Learning: A Case Study in Informatics Teaching Methodology . *International Journal of Pedagogics*, *05*(05-35), 139–143. https://doi.org/10.37547/ijp/Volume05Issue05-35

Omar, T. K. (2023). Students' Challenges in EFL Speaking Classrooms. *Academic Journal of Nawroz University*, *12*(4), 957–963. https://doi.org/10.25007/ajnu.v12n4a1809

Oraz, A., Malikov, K., Abenova, G., Sametova, Z., & Almautova, A. (2024). The effects of voice blogging on upper secondary students' L2 Kazakh speaking performance.

International Journal of Education and Practice, *12*(3), 1040–1053. https://doi.org/10.18488/61.v12i3.3821

Pakpahan, F., Sadira, L., Syifah, N., Jodi, S., Panjaitan, E., & Meisuri, W. (2025). The Effectiveness of Storytelling in Improving Speaking Skills of Junior High School Students. KIRANA : Social Science Journal, 2(2), 48–55. https://doi.org/10.61579/kirana.v2i2.474

Perez, M. M. (2022). Second or foreign language learning through watching audio-visual input and the role of on-screen text. *Language Teaching*, *55*(2), 1–30. https://doi.org/10.1017/s0261444821000501

Pinar, A. G. (2024). Initiating language engagement with multimodal learning tasks. *Studies in English Language and Education*, *11*(3), 1316–1332. https://doi.org/10.24815/siele.v11i3.35450

Ping, L., & Tao, N. (2025). Innovative approaches to English pronunciation instruction in ESL contexts: integration of multi-sensor detection and advanced algorithmic feedback. *Frontiers in Psychology*, *15*. https://doi.org/10.3389/fpsyg.2024.1484630

Pramesti, R. W., Arjulayana, & Firdaus, M. I. (2025). Dynamic Student's Public Speaking Through Digital Application. *IDEAS Journal on English Language Teaching and Learning Linguistics and Literature*, *13*(2), 3428–3443. https://doi.org/10.24256/ideas.v13i2.7315

Pratama, Moch. T. (2025). INCORPORATING VIDEO BLOGS (VLOGS) TO IMPROVE SPEAKING FLUENCY IN ENGLISH. *Indonesian Teaching English to Speakers of Other Languages Journal*, *2*(1), 174–183. https://doi.org/10.30587/inatesol.v2i1.9804

Prastyo, D., Purwoko, B., Rosyanafi, R. J., Mardiani, D. P., & Reswari, A. (2025). Digital Storytelling in Developing Expressive Language Skills in Early Childhood: A Phenomenological Study. *Al-Hikmah Indonesian Journal of Early Childhood Islamic Education*, *9*(1), 62–72. https://doi.org/10.35896/ijecie.v9i1.986

Quah, C. Y., & Ng, K. H. (2021). A Systematic Literature Review on Digital Storytelling Authoring Tool in Education: January 2010 to January 2020. *International Journal of Human–Computer Interaction*, *38*(9), 1–17. https://doi.org/10.1080/10447318.2021.1972608

Rahmanu, I. W. E. D., & Molnár, G. (2024). Multimodal immersion in English language learning in higher education: A systematic review. *Heliyon*, *10*(19), e38357. https://doi.org/10.1016/j.heliyon.2024.e38357

Riandini, D. (2025). Assessing Students' Perceptions of EFL Learners' Problems in Speaking Skills. *Sintaksis : Publikasi Para Ahli Bahasa Dan Sastra Inggris*, *3*(3), 236–244. https://doi.org/10.61132/sintaksis.v3i3.2195

Rosita, E., & Halimi, S. (2023). The Use of Flipgrid in Improving Secondary School Teachers' Motivation and Confidence in Speaking English. *JEELLS (Journal of English Education and Linguistics Studies)*, *10*(1), 27–55. https://doi.org/10.30762/jeels.v10i1.842

Rusanti, N. P., & Wismadewi, I. G. A. G. (2023). Exploring the Impact of Virtual Student Exchange Program on Personal and Speaking Proficiency Development of Indonesian EFL Students. *Ethical Lingua/Ethical Lingua*, *10*(2). https://doi.org/10.30605/25409190.578

Rzayeva, E. (2025). The Impact of Gestures and Facial Expressions in Language Acquisition. *Acta Globalis Humanitatis et Linguarum*, *2*(2), 203–214. https://doi.org/10.69760/aghel.025002110

Salleh, S. Y. N. O., & Ngui, W. (2023). Using Digital Multimodal Composing Technique to Enhance the Speaking Performance of Low-Proficiency Students: A Conceptual Paper.

International Journal on E-Learning Practices (IJELP), 6(1). https://doi.org/10.51200/ijelp.v6i1.4557

Seemab, S., Azhar, B., & Iftikhar, S. (2024). An Investigation into the Role of Pronunciation Apps in Speaking Improvement: A Comprehensive Analysis. *Bulletin of Business and Economics*, *13*(1). https://doi.org/10.61506/01.00219

Sesa, H., & Margana, M. (2025). Optimizing Whatsapp Features in Improving English Speaking Proficiency: A Classroom Action Research. *Journal of Languages and Language Teaching*, *13*(1), 414. https://doi.org/10.33394/jollt.v13i1.13347

Sherwani, K. A. (2021). Multimodal Discourse Analysis for teaching English as a Second Language. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, *12*(2), 279–285. https://doi.org/10.17762/turcomat.v12i2.712

Shiu, W. H. C. (2025). Conceptualising the Pedagogical Purposes of Technologies by Technological, Pedagogical Content Knowledge and Substitution, Augmentation, Modification and Redefinition in English as a Second Language Classrooms. *Education Sciences*, *15*(4), 411. https://doi.org/10.3390/educsci15040411

Simonyan, A. A. (2021). MULTIMODALITY IN CONTEMPORARY COMMUNICATION. *Armenian Folia Anglistika*, *17*(2 (24)), 63–76. https://doi.org/10.46991/afa/2021.17.2.063

Sok, S., & Shin, H. W. (2025). Do Interactions with ChatGPT Influence L2 Learners' Oral Speaking Ability, Summarization Ability, and Perceptions of Generative AI Tasks?. TESOL Quarterly. https://doi.org/10.1002/tesq.70001

Soroko, N., & Shymon, O. (2025). TEACHERS' READINESS TO USE DIGITAL TOOLS IN A STEAM-ORIENTED EDUCATIONAL ENVIRONMENT. *Educational Analytics of Ukraine*, *1*, 28–42. https://doi.org/10.32987/2617-8532-2025-1-28-42

Su, Y. (2023). Delving into EFL teachers' digital literacy and professional identity in the pandemic era: Technological Pedagogical Content Knowledge (TPACK) framework. *Heliyon*, *9*(6), e16361–e16361. https://doi.org/10.1016/j.heliyon.2023.e16361

Sulistianingsih, E., Fitriati, S. W., & Mujiyanto, J. (2025). Perceived Benefits of Digital Storytelling for Speaking Development Among Motivated Indonesian EFL Learners. *Register Journal*, *18*(1), 76–101. https://doi.org/10.18326/register.v18i1.76-101

Suseno, E., Purwati, O., & Anam, S. (2024). Using Podcasts, Lexico-Grammatical Resources, and Videos With Descriptive Images to Improve Speaking Skills. IJORER International Journal of Recent Educational Research, 5(1), 64–76. https://doi.org/10.46245/ijorer.v5i1.424

Tan, L., Thomson, R., Koh, J. H. L., & Chik, A. (2023). Teaching Multimodal Literacies with Digital Technologies and Augmented Reality: A Cluster Analysis of Australian Teachers' TPACK. Sustainability, 15(13), 10190. https://doi.org/10.3390/su151310190

Thilagam, P. S., Sahidul Islam, MD., Tamilarasan, Vijayakumar, S., Hameed, N. S., & raj, I. (2025). Mobile Applications for Self-Assessment in English Language Learning: Enhancing Learner Autonomy and Reflection. *2025 3rd International Conference on Intelligent Systems, Advanced Computing and Communication (ISACC)*, 422–426. https://doi.org/10.1109/isacc65211.2025.10969327

Toyama, M., & Hori, T. (2025). Technology-enhanced multimodal approaches in classroom L2 pronunciation training. Frontiers in Education, 10. https://doi.org/10.3389/feduc.2025.1552470

Tymoshchuk, N. (2025). DIGITAL STORYTELLING: DEVELOPING SPEAKING SKILLS IN LEARNING FOREIGN LANGUAGES. *Baltic Journal of Legal and Social Sciences*, *1*, 64–72. https://doi.org/10.30525/2592-8813-2025-1-7

Tran, N., Ngoc, T., Gillespie, R., Thi, T., & Phung, H. (2024). Enhancing EFL learners' speaking and listening skills through authentic online conversations with video conferencing tools. *Innovation in Language Learning and Teaching*, 1–11. https://doi.org/10.1080/17501229.2024.2334809

Ullah, R., Zhang, S., Asif, M., & Wahab, F. (2025). Multimodal learning-based speech enhancement and separation, recent innovations, new horizons, challenges and real-world applications. Computers in Biology and Medicine, 190, 110082. https://doi.org/10.1016/j.compbiomed.2025.110082

Véliz, L., & Campos, M. V. (2023). Multimodality as a "third space" for English as an additional language or dialect teaching: early career teachers' use and integration of technology in culturally and linguistically diverse classrooms. Educational Review, 77(4), 1–15. https://doi.org/10.1080/00131911.2023.2287415

Vu, N. N., Hung, B. P., Van, N. T. T., & Lien, N. T. H. (2021). Theoretical and Instructional Aspects of Using Multimedia Resources in Language Education: A Cognitive View. *Studies in Big Data*, 165–194. https://doi.org/10.1007/978-981-16-3828-2_9

Wang, T., Zhang, B., Jiang, D., & Li, D. (2025). A Multimodal Large Language Model Framework for Intelligent Perception and Decision-Making in Smart Manufacturing. Sensors, 25(10), 3072. https://doi.org/10.3390/s25103072

Wei, R., & Fan, L. (2022). On-Screen Texts in Audiovisual Input for L2 Vocabulary Learning: A Review. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.904523

Yuniarti, & Yulian, R. (2022). Digital Story Telling Based on Multimodal Elements on EFL Learners' Speaking Performance. *JPI (Jurnal Pendidikan Indonesia)*, *11*(2), 308–316. https://doi.org/10.23887/jpiundiksha.v11i2.40217

Zhang, M. (2024). VLOG-BASED EFL TEACHING MODEL FOR UNIVERSITY STUDENTS: IMPACT ON SPEAKING SKILLS AND ENGAGEMENT. *PUPIL International Journal of Teaching Education and Learning*, 146–147. https://doi.org/10.20319/ictel.2024.146147

Zhang, K. (2025). Empowering Educators: Overcoming Challenges in Digital Education for Remote Areas. *Lecture Notes in Education Psychology and Public Media*, *81*(1), 94–101. https://doi.org/10.54254/2753-7048/2025.20510

Zhang, Q., & Jing, Y. (2025). The impact of interpreting students' gestures and speech content on speech fluency of consecutive interpreting. *Frontiers in Psychology*, *16*. https://doi.org/10.3389/fpsyg.2025.1568341

Zhou, A. (2023). Investigating the impact of online language exchanges on second language speaking and willingness to communicate of Chinese EFL learners: a mixed methods study. *Frontiers in Psychology*, *14*. https://doi.org/10.3389/fpsyg.2023.1177922

Zhou, X., & Goh, Y. S. (2025). What shapes tertiary learners' experiences and challenges in mobile-assisted seamless vocabulary learning? A case of Chinese as a foreign language. *Acta Psychologica*, *257*, 105123–105123. https://doi.org/10.1016/j.actpsy.2025.105123

Zulkepli, N., Mohd Ariff Albakri, I. S., Megat Khalid, P. Z., Ishak, M. F. F., & Raja Harun, R. N. S. (2024). From Needs Analysis to Programme Design: Online Speaking Skills Upskilling Programme for ESL Teachers. World Journal of English Language, 14(6), 13. https://doi.org/10.5430/wjel.v14n6p13