

Digital tools in blended learning for improving EFL students' speaking skills at the university level: A systematic review

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Abstract

The integration of digital tools within blended learning environments has become increasingly central to English as a Foreign Language (EFL) instruction at the university level, particularly for developing speaking skills which require spontaneous interaction and extended practice opportunities. However, the evidence base remains fragmented, with existing reviews often aggregating across educational levels and geographical contexts, thereby limiting generalizability to tertiary EFL settings. This systematic literature review aims to synthesize empirical evidence on the types, effectiveness, and implementation challenges of digital tools used in blended learning to improve EFL speaking skills among university students. Following PRISMA guidelines, a systematic search of Google Scholar yielded 447 records, with 24 peer-reviewed empirical studies published between 2021–2026 meeting inclusion criteria. Data were extracted and analyzed using a convergent integrated approach. Findings reveal that Learning Management Systems, video-based tools, and synchronous conferencing platforms are most widely adopted, while AI-powered and immersive technologies remain nascent. Fluency and vocabulary emerged as the most consistently improved speaking sub-skills, followed by learner confidence and engagement, whereas coherence and grammar demonstrated selective gains. Technical infrastructure instability, inadequate teacher training, and AI's discourse-level limitations constitute persistent challenges, mitigated by scaffolded instructional design, immediate personalized feedback, and peer collaboration. The review concludes that pedagogical intentionality and institutional readiness, rather than technological sophistication alone, determine successful integration.

Keywords

blended learning, digital tools, EFL speaking skills, systematic literature review, university level

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Introduction

The ability to speak effectively in English as a Foreign Language (EFL) is widely recognized as a cornerstone of academic and professional success in the 21st century. Unlike reading or writing, speaking demands real-time processing, spontaneous interaction, and pragmatic competence, skills that are notoriously difficult to develop in foreign language contexts where exposure to authentic English outside the classroom is minimal (Richards, 2015; Saed et al., 2021). For university students, speaking proficiency becomes even more critical as they are expected to participate in seminar discussions, deliver academic presentations, and engage in group projects that require fluent oral communication. Simultaneously, higher education institutions globally have undergone a profound digital transformation, accelerated by the COVID-19 pandemic, which forced a rapid shift toward technology-mediated learning environments (Hodges & Fowler, 2020). This shift fundamentally altered traditional pedagogies, pushing educators to reconsider how digital tools can be leveraged not merely as supplements but as integral components of language instruction. Consequently, blended learning, an approach that strategically combines face-to-face instruction with online activities, has emerged as a dominant instructional model in post-pandemic higher education, promising flexibility, personalization, and extended opportunities for language practice (Chano et al., 2025).

Within this evolving landscape, several specific factors converge to shape the effectiveness of technology-enhanced speaking instruction at the university level. First, the array of digital tools available for speaking practice has expanded dramatically, ranging from synchronous video-conferencing platforms that simulate real-time interaction, to asynchronous tools that permit self-paced recorded practice, and to artificial intelligence (AI)-powered applications that provide automated feedback on pronunciation and fluency (Asratie et al., 2023; Moorhouse & Kohnke, 2021). Second, blended learning models in higher education vary considerably, from station rotation and lab rotation models to self-blend and online-driven frameworks, each offering different ratios of face-to-face to online instruction, which potentially moderates speaking development outcomes (Müller & Mildenerberger, 2021). Third, the nature of speaking skills themselves is multifaceted, encompassing linguistic sub-skills (accuracy, fluency, pronunciation, vocabulary) and interactional competences (turn-taking, repair strategies, pragmatic appropriateness) (Goh & Burns, 2012). University-level EFL learners face unique challenges here, including heightened communication apprehension in academic contexts, limited opportunities for extemporaneous speech, and the absence of an English-speaking environment outside class hours (Pan et al., 2025). Finally, the EFL context, distinct from ESL (English as a Second Language), means students rarely encounter English in daily life, making the integration of digital tools not merely beneficial but potentially essential for creating the repeated, low-stakes practice opportunities necessary for speaking development (Chen & Lin, 2019).

The interaction among these factors, digital tools, blended learning designs, and speaking sub-skills, creates a complex pedagogical landscape rather than a simple cause-effect relationship. One layer of complexity lies in the synchronous versus asynchronous dichotomy. Synchronous video-conferencing enables real-time interaction and immediate teacher feedback, which closely mirrors authentic conversation; however, it often induces technical anxiety, self-consciousness, and the cognitive load of managing both language production and digital interfaces (Bailey et al., 2022; Yu, 2022). Asynchronous voice recording tools, by contrast, allow learners to rehearse repeatedly, self-monitor, and reduce anxiety, but they lack spontaneous back-and-forth interaction, potentially failing to develop reactive speaking skills (Dentella et al., 2023). A second layer involves feedback mechanisms. AI-powered tools can provide instant, individualized pronunciation correction, an advantage impossible in large face-to-face classes, yet automated feedback often misses pragmatic nuances, discourse-level coherence, and contextual appropriateness, which remain better addressed by human peers or instructors (Sun,

2023). Third, learner characteristics such as self-regulation, digital literacy, and motivation significantly mediate outcomes. Students with strong self-regulatory skills thrive in blended environments, taking advantage of asynchronous practice modules, whereas those with poor self-regulation may procrastinate or disengage, widening achievement gaps (Broadbent et al., 2021; Dentella et al., 2023). Furthermore, inequities in access to stable internet connections, modern devices, and quiet physical spaces persist even among university students, particularly in developing countries, creating what is termed the "digital divide" within blended learning implementations (Alam et al., 2023). These interacting complexities suggest that no single digital tool or blended model is universally effective; instead, outcomes depend on how these factors are orchestrated within specific instructional contexts.

Why does this interaction and complexity matter specifically at the university level in EFL speaking instruction? Recent empirical research provides compelling evidence that the effectiveness of digital tools is highly conditional, yet the field lacks systematic synthesis to guide evidence-based practice. For instance, a meta-analysis by Yi et al. (2025) found that while technology-assisted speaking instruction produced a moderate overall effect size, the effects varied dramatically across sub-skills: pronunciation benefited most from automated feedback tools, whereas interactional competence showed no significant improvement from asynchronous-only interventions. More recently, Wu et al. (2025) demonstrated that AI-chatbots improved lexical diversity in speaking but did not reduce silence durations, suggesting that fluency and vocabulary draw upon different learning mechanisms. Critically, most existing systematic reviews on digital tools for speaking skills have aggregated studies across primary, secondary, and tertiary levels, even though university learners differ in cognitive maturity, motivational profiles, and speaking demands (Nair & Yunus, 2021). Finally, research to date has rarely disentangled the specific challenges of implementation at scale: what works in a 30-person pilot course may fail in a 300-person required university course due to differences in technical support, instructor training, and student compliance (Rasheed et al., 2020). These gaps underscore an urgent need for a systematic review that specifically targets university-level EFL speaking instruction within blended learning environments, synthesizing not only effectiveness but also contextual barriers and enablers.

Given the unresolved complexities and the fragmented evidence base described above, the present study conducts a systematic literature review to address the following research questions:

1. What types of digital tools have been implemented in blended learning environments to enhance EFL speaking skills at the university level?
2. How effective are these digital tools in improving specific aspects of EFL speaking skills among university students?
3. What are the reported challenges and facilitating factors in integrating digital tools within blended learning frameworks for EFL speaking instruction at the university level?.

Method

Research Design

A systematic literature search was conducted to identify peer-reviewed empirical studies examining the integration of digital tools within blended learning environments aimed at improving English speaking skills among university-level EFL learners. The primary electronic database employed was Google Scholar, chosen for its extensive coverage of educational

technology and applied linguistics literature, including open-access and grey literature sources that are often missed in subscription-only databases. The search was performed in March 2026 to align with the predefined publication window.

To maximize retrieval sensitivity, a Boolean search string was constructed combining key concepts:

("digital tool" OR "technology-enhanced" OR "online platform" OR mobile app) AND ("blended learning" OR "hybrid course" OR "flipped classroom") AND ("speaking skill" OR "oral proficiency" OR "EFL speaking") AND ("university" OR "undergraduate" OR "postgraduate" OR "tertiary").

No additional filters for publication type were applied at this stage to avoid premature exclusion of relevant records. The search yielded an initial pool of 447 potentially relevant records after duplicate removal within Google Scholar's native deduplication feature.

Article Selection Criteria

Studies identified through the search were assessed against a preregistered set of inclusion and exclusion criteria as followed table.

Tabel 1. Criterion of Inclusion & Exclusion

No	Criterion	Inclusion	Exclusion
1	Publication Period	Articles published between 2021–2026 (5-year range, inclusive of 2026 as partial year if applicable)	Articles published before 2021 or after 2026
2	Population & Context	University-level students (undergraduate or postgraduate) in EFL/ESL settings; studies involving blended learning environments	K-12 students, non-university adult learners, non-EFL contexts, or no clear mention of university level
3	Study Type	Empirical research (qualitative, quantitative, or mixed-methods); peer-reviewed journal articles	Non-empirical articles (opinion pieces, literature reviews, editorials), theses, dissertations, or conference proceedings
4	Language	Articles written in English	Articles written in any language other than English
5	Full Text Availability	Full text is accessible and retrievable (via library subscription, open access, or interlibrary loan)	Full text is unavailable (only abstract accessible, broken links, or restricted beyond feasible retrieval)
6	Intervention	Studies using digital tools as part of blended learning to improve speaking skills	No specific digital tool mentioned, or digital tools used only for non-speaking purposes
7	Outcome	Studies that report measurable outcomes related to speaking skills	Outcomes focus exclusively on other language skills (reading, writing, listening) or general attitudes without linking to speaking performance

Article Selection Process

The study selection adhered to the four-stage PRISMA framework, comprising identification, screening, eligibility determination, and final inclusion. Following the primary database search in Google Scholar, duplicate records were removed using an automated deduplication function within the reference manager, followed by manual cross-checking to ensure accuracy. Two independent reviewers subsequently screened the titles and abstracts of the remaining records against the predefined eligibility criteria; any discrepancies between reviewers were resolved through consensus or, when necessary, by consulting a third reviewer. Full-text versions of articles deemed potentially relevant were then retrieved and assessed for eligibility. In cases where a full-text article could not be accessed after systematic retrieval attempts, the record was excluded from further consideration. Ultimately, 24 studies satisfied all inclusion criteria and were retained for synthesis. A detailed breakdown of the number of records excluded at each stage, along with the reasons for exclusion, is presented in the PRISMA flow diagram (see Figure 1).

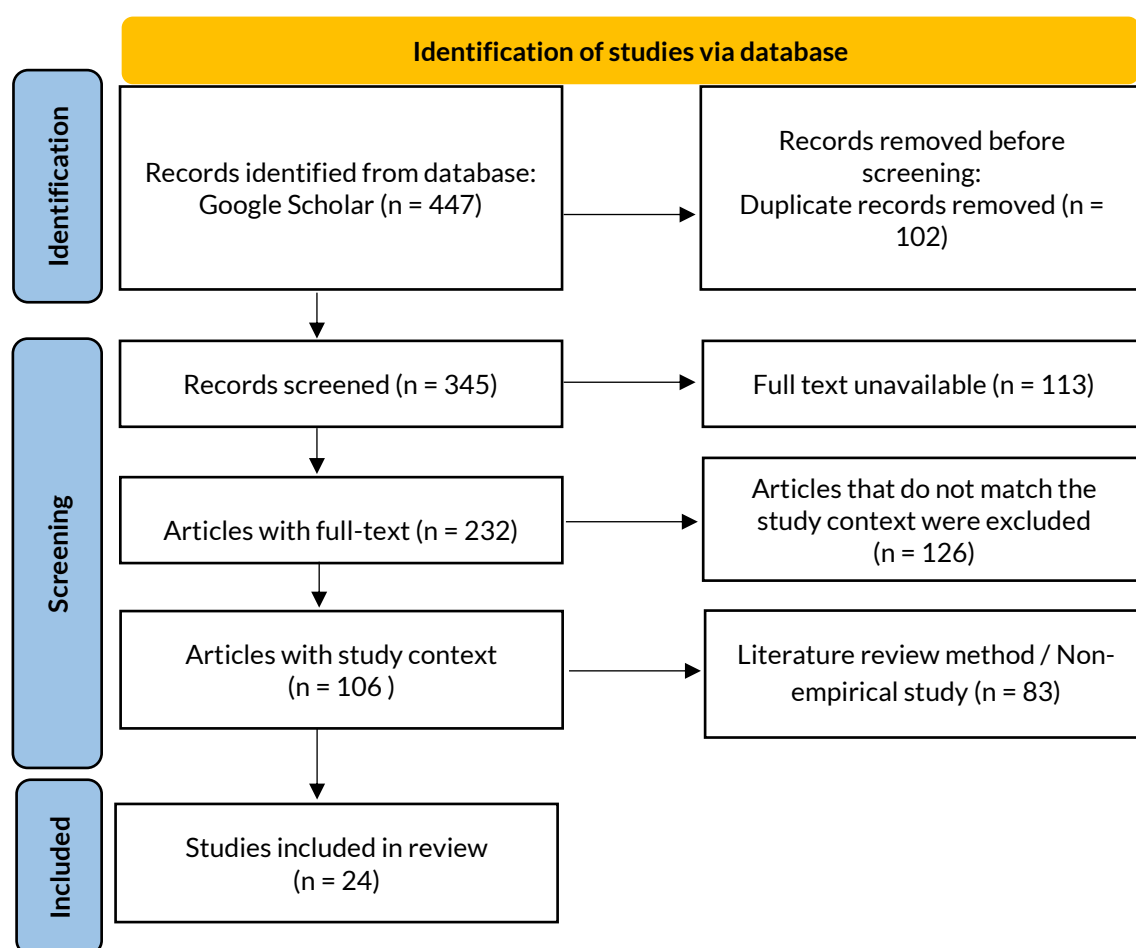


Figure 1. PRISMA Flow Diagram of the Article Selection
(Source: PRISMA 2020 Flow Diagram (Page et al., 2021))

Data Collection and Data Analysis

Data collection was performed using a standardized data extraction sheet developed specifically for this review. The sheet captured: (a) bibliometric information (author, year, country), (b) study design and sample characteristics, (c) types of digital tools used, (d) blended learning model

description, (e) measured speaking outcomes (e.g., fluency, accuracy, pronunciation, interaction), (f) reported effectiveness, and (g) documented challenges or facilitating factors. Data extraction was conducted independently by two reviewers, with disagreements resolved through consensus or consultation with a third reviewer.

For data analysis, a convergent integrated approach was adopted to synthesize qualitative and quantitative findings aligned with the three research sub-questions:

1. Research Sub-question 1 (Types of Digital Tools Implemented): Extracted tools were categorized inductively into functional typologies.
2. Research Sub-question 2 (Effectiveness in Improving Specific Aspects of Speaking): A thematic synthesis of outcome measures was performed, coding improvements in discrete speaking sub-skills.
3. Research Sub-question 3 (Challenges and Facilitating Factors): Barriers and enablers were extracted and thematically grouped using an inductive coding framework.

No meta-analysis was conducted due to heterogeneity in outcome measurements and intervention designs. All synthesized findings were narratively reported to preserve contextual richness and facilitate interpretation for blended learning practitioners and researchers.

Results and Discussion

Types of Digital Tools Implemented in Blended Learning Environments to Enhance EFL Speaking Skills

The reviewed studies reveal a diverse and expanding repertoire of digital tools employed within blended learning (BL) environments to support EFL speaking skill development at the university level. Across the 24 articles analyzed, digital tools were found to span eight broad categories: Learning Management Systems (LMS), social media platforms, video-based tools, AI-powered applications, immersive technologies (VR/AR/metaverse), synchronous video conferencing platforms, Mobile-Assisted Language Learning (MALL) applications, and other specialized platforms. Among these, LMS emerged as the most widely adopted category, appearing in 17 out of 24 studies, encompassing platforms such as Blackboard Collaborate Ultra, Google Classroom, Moodle, Schoology, Chaoxing MLMS, and institutional LMS systems (Ahmad, 2021; S. M. Ali et al., 2023; Ariani et al., 2023; Fischer & Yang, 2022; Ha, 2024; Huang, 2021; Manipatruni et al., 2024; Mortaji, 2022; Muluk et al., 2025; Peng & Fu, 2021; Pu & Chang, 2025; Rahmawati, 2022; Rehman et al., 2025; Sari et al., 2021; Sheerah & Yadav, 2022; Tabassum & Saad, 2024; Zhou et al., 2025). These platforms served as the organizational backbone of BL courses, enabling structured content delivery, assignment submission, and learning analytics. Video-based tools constituted the second most frequently identified category ($n = 14$), encompassing pre-recorded video lectures, student-produced video assignments, vlogs, video-based course blogs, and instructional videos distributed via YouTube, Dropbox, or embedded within LMS environments (Ali et al., 2024; Ali et al., 2023; Ariani et al., 2023; Fischer & Yang, 2022; Huang, 2021; Khodabandeh et al., 2025; Manipatruni et al., 2024; Mohammadi et al., 2021; Mortaji, 2022; Muluk et al., 2025; Nur et al., 2024; Pu & Chang, 2025; Rahmawati, 2022; Sheerah & Yadav, 2022). These tools were particularly valued for enabling asynchronous speaking practice, allowing learners to rehearse, record, and reflect on their oral production independently of

classroom time. Synchronous video conferencing tools, including Zoom, Google Meet, Microsoft Teams, Adobe Connect, and Google Hangouts on Air, were similarly prevalent ($n = 11$), facilitating real-time interaction, peer feedback, and instructor-monitored speaking tasks across both face-to-face and virtual modalities (Ali et al., 2024; Ali et al., 2023; Ariani et al., 2023; Huang, 2021; Khodabandeh et al., 2025; Manipatruni et al., 2024; Muluk et al., 2025; Nur et al., 2024; Sheerah & Yadav, 2022; Tabassum & Saad, 2024).

Social media platforms constituted another prominent category ($n = 10$), with Facebook Groups, WhatsApp, Instagram, YouTube channels, and video-based course blogs integrated to promote informal, low-stakes speaking practice and peer collaboration (M. M. M. Ali et al., 2024; Ariani et al., 2023; Huang, 2021; Khodabandeh et al., 2025; Manipatruni et al., 2024; Muluk et al., 2025; Nur et al., 2024; Sheerah & Yadav, 2022; Tabassum & Saad, 2024). The pervasive adoption of WhatsApp Groups across multiple studies underscores its role as a readily accessible, low-barrier communication tool for both asynchronous discussion and real-time instructional support. Emerging AI-powered tools were documented in four studies, with ChatGPT (including ChatGPT-4), Google Gemini, and AI-driven pronunciation and speaking applications integrated to provide personalized, on-demand oral practice with immediate automated feedback (Lai, 2026; Pinandhita, 2025; Rehman et al., 2025; Zhou et al., 2025). These tools demonstrated particular utility in enabling 24/7 access to conversational practice and formative feedback, thereby addressing a common limitation of classroom-bound speaking instruction. Immersive and emergent technologies, comprising Virtual Reality (VR) simulations, Augmented Reality (AR) applications, and the metaverse platform Gather Town, appeared in three studies, reflecting a nascent but growing trajectory in EFL BL research (Ha, 2024; Khodabandeh et al., 2025; Rehman et al., 2025). MALL applications, including mobile-based language apps, speech recognition tools, chatbots, and vocabulary platforms, were identified in four studies as facilitators of self-paced, context-independent language practice (Peng & Fu, 2021; Pinandhita, 2025; Rehman et al., 2025; Zhou et al., 2025). The detailed distribution of digital tool categories across included studies is presented in Table 2.

Table 2. Distribution of Digital Tool Categories Across Included Studies ($n = 24$)

No	Authors	LMS (a)	Social Media (b)	Video- Based Tools (c)	AI- Powered Tools (d)	VR/AR/ Metaverse (e)	Sync. Video Conf. (f)	MALL (g)	Others (h)
1	Ali et al. (2024)								
2	Rehman et al. (2025)								
3	Ali et al. (2023)								
4	Manipatruni et al. (2024)								
5	Khodabandeh et al. (2025)								
6	Pinandhita (2025)								

No	Authors	LMS (a)	Social Media (b)	Video- Based Tools (c)	AI- Powered Tools (d)	VR/AR/ Metaverse (e)	Sync. Video Conf. (f)	MALL (g)	Others (h)
7	Sari et al. (2021)								
8	Mohammadi et al. (2021)								
9	Ariani et al. (2023)								
10	Tabassum & Saad (2024)								
11	Rahmawati (2022)								
12	Mortaji (2022)								
13	Lai (2026)								
14	Zhou et al. (2025)								
15	Wang (2021)								
16	Ha (2024)								
17	Fischer and Yang (2022)								
18	Muluk et al. (2025)								
19	Pu and Chang (2025)								
20	Sheerah & Yadav (2022)								
21	Ahmad (2021)								
22	Huang (2021)								
23	Peng and Fu (2021)								
24	Nur et al. (2024)								
Total (n = 24)		18	8	14	4	3	10	4	6

Note: a) Learning Management System; b) Social media platforms; c) Video-based tools; d) AI-powered tools; e) Virtual Reality, Augmented Reality, or metaverse environments; f) Synchronous video conferencing platforms; g) Mobile-Assisted Language Learning applications; h) Other specialized or purpose-built platforms. Colored = tool category identified in the study.

The distribution of digital tool categories across the reviewed studies reveals a predominant reliance on institutional or purpose-built platforms for content management alongside communication-oriented social and video-based tools, while AI and immersive technologies remain comparatively nascent in BL contexts for EFL speaking development. Noteworthy is the frequent co-deployment of multiple tool categories within a single BL design, most studies integrated two or more categories, with LMS typically anchoring the instructional architecture and supplementary tools (social media, video-based platforms, or synchronous conferencing) layered to address specific communicative or affective learning objectives. This multi-tool integration reflects a broader pedagogical orientation toward bichronous learning environments that blend synchronous interaction with asynchronous practice, thereby accommodating diverse learner schedules, proficiency levels, and anxiety profiles (Manipatruni et al., 2024; Muluk et al., 2025; Rehman et al., 2025; Zhou et al., 2025). Collectively, these findings suggest that the effectiveness of digital tools in BL-EFL speaking contexts is less a function of any single platform than of their purposeful, theoretically grounded combination within a coherent instructional framework.

The Effectiveness of Digital Tools in Improving Specific Aspects of EFL Speaking Skills

The synthesis of findings from the reviewed studies reveals that digital tools integrated within blended learning (BL) environments exert a broad and measurable impact across multiple dimensions of EFL speaking performance. Fluency consistently emerged as the most frequently enhanced aspect, evidenced across a substantial number of studies. AI-driven applications and chatbot-integrated frameworks demonstrated notable gains in fluency; for instance, the AI chatbot-integrated Mobile-Assisted Blended Learning (MABL) framework yielded a significantly higher fluency score in the experimental group compared to the control group (Zhou et al., 2025), while asynchronous video tools such as Flipgrid enhanced fluency through self-paced, repeated practice (Manipatruni et al., 2024). Vocabulary acquisition was similarly reported as a frequently improved aspect, with studies documenting gains through platforms such as collaborative vlog projects (Huang, 2021), social media-integrated BL (Ali et al., 2024), and dedicated vocabulary applications such as BaiCizhan (Peng & Fu, 2021). Learner confidence and self-efficacy also figured prominently in the literature, with technologies ranging from metaverse-based platforms (Ha, 2024) to project-based video tasks (Huang, 2021) and Community of Inquiry (CoI)-structured environments (Tabassum & Saad, 2024) reported as effective in reducing speaking anxiety and fostering greater willingness to communicate.

Pronunciation improvement, while less universally addressed, was documented across studies employing AI-powered tools and speech recognition technologies. ChatGPT-integrated task-based frameworks produced significant gains in pronunciation accuracy (Lai, 2026), and MALL applications with metacognitive strategy training demonstrated the largest fluency gains alongside pronunciation development (Pinandhita, 2025). Accuracy was enhanced through structured digital scaffolding, including AI real-time corrective feedback (Lai, 2026), learn social LMS with automatic scoring (Sari et al., 2021), and CALL programs offering individualized skill-based practice (Ahmad, 2021). Engagement and motivation were notably reinforced by synchronous collaborative tools and gamified platforms; studies using Google Hangouts on Air, Zoom-based flipped classrooms, and hybrid learning environments documented heightened behavioral, cognitive, and emotional engagement (Fischer & Yang, 2022; Muluk et al., 2025; Nur et al., 2024). Coherence and discourse-level production received comparatively limited attention, with only a small number of studies, notably those using AR-enhanced blended models (Khodabandeh et al., 2025) and AI tools (Lai, 2026), reporting structured improvement at the discourse and grammatical level. It is noteworthy that Lai (2026) explicitly identified coherence

as an area where AI support remained insufficient, as current AI tools tend to operate at the sentence level rather than providing discourse-level guidance.

Taken together, these findings suggest a hierarchical pattern of digital tool effectiveness across speaking sub-skills: fluency and vocabulary represent the most consistently and significantly improved aspects, followed by confidence and engagement/motivation, while accuracy, pronunciation, coherence, grammar, and creativity appear as more selectively enhanced dimensions contingent on the specific tool type, instructional design, and duration of intervention. This pattern reflects a tendency in BL research to prioritize communicative fluency over formal accuracy, consistent with a communicative language teaching (CLT) orientation (Ali et al., 2024; Rehman et al., 2025). The detailed distribution of speaking aspects improved across the reviewed studies is presented in Table 3.

Table 3. Distribution of Speaking Skill Aspects Improved by Digital Tools Across Studies

No	Authors	Flu.	Pro.	Voc.	Acc.	Con.	Eng./Mot.	Coh.	Gram.	Cre.	Others
1	Ali et al. (2024)										
2	Rehman et al. (2025)										
3	Ali et al. (2023)										
4	Manipatruni et al. (2024)										
5	Khodabandeh et al. (2025)										
6	Pinandhita (2025)										
7	Sari et al. (2021)										
8	Mohammadi et al. (2021)										
9	Ariani et al. (2023)										
10	Tabassum and Saad (2024)										
11	Rahmawati (2022)										
12	Mortaji (2022)										
13	Lai (2026)										
14	Zhou et al. (2025)										
15	Wang (2021)										

No	Authors	Flu.	Pro.	Voc.	Acc.	Con.	Eng./Mot.	Coh.	Gram.	Cre.	Others
16	Ha (2024)										
17	Fischer and Yang (2022)										
18	Muluk et al. (2025)										
19	Pu and Chang (2025)										
20	Sheerah and Yadav (2022)										
21	Ahmad (2021)										
22	Huang (2021)										
23	Peng and Fu (2021)										
24	Nur et al. (2024)										
Total		15	5	7	5	10	12	2	1	3	2

Note: Flu. = Fluency; Pro. = Pronunciation; Voc. = Vocabulary; Acc. = Accuracy; Con. = Confidence/Self-efficacy; Eng./Mot. = Engagement/Motivation; Coh. = Coherence; Gram. = Grammar; Cre. = Creativity; Others = other speaking-related aspects (e.g., authentic production, public speaking delivery). Colored = aspect improved as reported by the study.

Challenges and Facilitating Factors in Integrating Digital Tools Within Blended Learning Frameworks For EFL Speaking Instruction

The integration of digital tools within blended learning (BL) frameworks for EFL speaking instruction is marked by a recurring constellation of challenges that span technical, pedagogical, and learner-related dimensions. Across the reviewed studies, the most pervasive challenge is *technical and infrastructural barriers*, reported in 16 of 24 articles, encompassing unstable internet connectivity, limited device access, and software compatibility issues (Ali et al., 2024; Ha, 2024; Mohammadi et al., 2021; Muluk et al., 2025; Nur et al., 2024; Pinandhita, 2025). These infrastructural constraints are particularly salient in developing-country contexts such as Indonesia and Bangladesh, where digital divides between urban and rural learners persist (Pinandhita, 2025; Tabassum & Saad, 2024). Compounding this, *learner-side barriers*, including low intrinsic motivation, resistance to unfamiliar platforms, home distractions, and insufficient digital literacy, were identified in 12 studies (Ahmad, 2021; Fischer & Yang, 2022; Nur et al., 2024; Peng & Fu, 2021; Sheerah & Yadav, 2022). Notably, Fischer and Yang (2022) observed that students in the regular flipped group exhibited low accountability and arrived in class unprepared, underperforming even relative to traditional instruction. At the institutional level, pedagogical and organizational constraints, such as inadequate teacher training, misaligned assessment practices, timetable rigidity, and insufficient administrative backing, were reported in 10 studies (Ahmad, 2021; Ali et al., 2024; Rehman et al., 2025; Tabassum & Saad, 2024). A more nuanced category of challenge involves *tool-specific pedagogical limitations*: AI-powered tools such as ChatGPT, while effective for pronunciation and accuracy gains, were found to be incapable of supporting discourse-level fluency development due to sentence-bound feedback

mechanisms and context insensitivity (Lai, 2026; Zhou et al., 2025). Similarly, the high cost of immersive technologies and the brevity of intervention periods in experimental designs were identified as structural impediments limiting the scalability and ecological validity of findings (Khodabandeh et al., 2025; Rehman et al., 2025).

Notwithstanding these challenges, the reviewed literature consistently identifies a robust set of facilitating factors that enable effective digital tool integration in BL speaking contexts. The most frequently reported facilitating factor is *scaffolded and structured instructional design*, present in 18 studies, encompassing Zone of Proximal Development (ZPD)-aligned support, task-based learning, bichronous (synchronous + asynchronous) instructional models, and flipped classroom architectures (Fischer & Yang, 2022; Manipatruni et al., 2024; Muluk et al., 2025; Pu & Chang, 2025; Rehman et al., 2025). For instance, Manipatruni et al. (2024) demonstrated that combining asynchronous Flipgrid practice with synchronous CEFR-rubric-based classroom feedback, a bichronous configuration, not only improved speaking performance ($t=13.74$, $p<0.05$) but also reduced learner anxiety through multiple submission affordances. Closely related is the factor of *immediate and personalized feedback*, identified in 14 studies, delivered variously through AI systems (Lai, 2026; Zhou et al., 2025), teacher-mediated channels (Ali et al., 2023; Pinandhita, 2025), and structured peer feedback mechanisms (Huang, 2021; Mortaji, 2022). The affordance of 24/7 AI chatbot accessibility, enabling unrestricted practice beyond class hours, was particularly highlighted as reducing cognitive load and speaking anxiety (Zhou et al., 2025). Additionally, *learner autonomy and flexible self-paced access* were noted in 12 studies as core enablers, especially when learners were provided with downloadable materials, asynchronous video repositories, and adaptive platform pathways that aligned with individual learning paces and proficiency levels (Peng & Fu, 2021; Pinandhita, 2025; Sari et al., 2021; Sheerah & Yadav, 2022). Peer collaboration and social presence, operationalized through Community of Inquiry (CoI) frameworks, group-based vlogging, and collaborative virtual environments, constituted another influential facilitating condition reported in nine studies (Fischer & Yang, 2022; Huang, 2021; Khodabandeh et al., 2025; Tabassum & Saad, 2024), underscoring the centrality of social learning dynamics in sustaining speaking development within BL ecosystems.

Taken together, the evidence suggests a dialectical relationship between challenges and facilitating factors: infrastructural and motivational challenges are often mitigated through instructional design innovation, technological scaffolding, and teacher-mediated support rather than through technological sophistication alone. Studies consistently demonstrate that when instructors invest in explicit strategy training, establish structured participation requirements, and create low-stakes practice environments, irrespective of the specific platform employed, learners exhibit measurable gains in speaking fluency, confidence, and self-efficacy (Nur et al., 2024; Pinandhita, 2025; Rahmawati, 2022; Rehman et al., 2025). Conversely, studies characterized by minimal institutional support, insufficient teacher preparation, or misaligned assessment systems tended to report attenuated effects or heightened student resistance (Ahmad, 2021; Sheerah & Yadav, 2022; Tabassum & Saad, 2024). This pattern underscores a central implication: the effectiveness of digital tool integration in BL-based EFL speaking instruction is not primarily a function of tool novelty or technological capacity but is contingent upon the pedagogical intentionality with which such tools are embedded within broader instructional ecosystems, as well as the institutional readiness to support sustained professional development and equitable access (Ali et al., 2024; Mohammadi et al., 2021; Tabassum & Saad, 2024).

Table 4. Challenges and Facilitating Factors in Digital Tool Integration Within Blended Learning for EFL Speaking Instruction

No	Authors	Challenges	Facilitating Factors
1	Ali et al. (2024)	Teachers' reluctance toward technology; limited student device access; digital divide; non-academic social media use	Self-learning via Google; junior–senior teacher collaboration; short training sessions; private Facebook/Messenger groups
2	Rehman et al. (2025)	High VR costs; small sample and short duration (12 weeks); inadequate LMS for interactive speaking practice	Low-stakes personalized practice; ZPD scaffolding; immediate AI/VR feedback; dedicated teacher training
3	Ali et al. (2023)	Limited technology infrastructure; uneven digital literacy; initial student confusion; cultural norms; lack of preparation	Pedagogical adaptation (flipped/reflection tasks); teacher support; multiple submission attempts; structured feedback cycles
4	Manipatruni et al. (2024)	Limited synchronous speaking time; small sample (n=29); timetable constraints	Bichronous model combining asynchronous Flipgrid practice with synchronous CEFR feedback; multiple submissions reducing anxiety
5	Khodabandeh et al. (2025)	Limited to a single institute and narrow topic (clothing/style); individual affective factors not examined	Constructivist and inquiry-based learning; real-time teacher feedback; peer collaboration; authentic AR-based task scenarios
6	Pinandhita (2025)	Internet instability (27.6%); limited device access (19.5%); early digital adaptation difficulties (14.1%); uneven infrastructure	Explicit strategy training; active feedback adaptation; teacher mediation; peer interaction; scaffolding; learner autonomy
7	Sari et al. (2021)	Low student attendance; some students missed test deadlines	Individual Rotation Model (flexible time/path/pace); automatic scoring; alignment with digital-native learner needs
8	Mohammadi et al. (2021)	Limited online collaboration; technical issues (slow internet, software); high self-discipline demands; unequal device access	Four FLIP pillars (flexible environment, learning culture, intentional content, professional educator); easier F2F pair/group work
9	Ariani et al. (2023)	Pronunciation difficulties with technical vocabulary; poor audio quality; unequal speaking turns; short video duration	Student-chosen topics; group work reducing anxiety; flexible online environment; authentic PBL tasks
10	Tabassum and Saad (2024)	Need for teacher training in tech/pedagogy; insufficient institutional support; misaligned traditional assessment; student resistance	CoI framework (teaching, social, cognitive presences); professional development; inquiry-based collaborative activities

No	Authors	Challenges	Facilitating Factors
11	Rahmawati (2022)	COVID-19 forced full-online shift; slow/unstable internet connectivity	Activities aligned to objectives and real-life contexts; student-centered/autonomous learning; flexibility in time and place
12	Mortaji (2022)	Slow internet; some students reluctant to share all speeches online; anonymous comments required moderation	Face-to-face theory sessions; netiquette instruction; graded online participation (10%); weekly instructor monitoring
13	Lai (2026)	Fluency unchanged due to cognitive interruptions from real-time AI feedback; AI lacks discourse-level and contextual sensitivity	Task-based integration (ChatGPT for interaction, Gemini for planning); free/accessible tools; structured 18-week intervention
14	Zhou et al. (2025)	Accuracy/complexity unchanged (8-week intervention too short); limited peer collaboration; small single-institution sample	MABL flexibility; personalized AI feedback; high ease of learning (M=4.18/5); reduced cognitive load; 24/7 access
15	Wang (2021)	Non-transparent placement rubric; short implementation (18 weeks); difficulty monitoring individual online learning	One-on-one native speaker tutoring; flexible scheduling; regular participation requirement (12 sessions)
16	Ha (2024)	Limited/outdated internet facilities; school policy blocking external sites; metaverse unfamiliarity; small sample (n=24)	User-friendly 2D interface; avatar-mediated anxiety reduction; podium feature; spatial audio; gamification elements
17	Fischer and Yang (2022)	Regular flipped group had low accountability and came to class unprepared; underperformed traditional class; small sample (N=54)	Col framework; peer-instruction pressure; instructor monitoring of recorded sessions; synchronous collaboration reducing isolation
18	Muluk et al. (2025)	Inadequate social presence vs. face-to-face; technical issues (internet, background noise); difficulty reading non-verbal online cues	Modified flipped model (WhatsApp async + Zoom sync); flexible time management; engaging videos; learner autonomy
19	Pu and Chang (2025)	High need for self-autonomy; caption distraction in multimodal mode; individual input-mode preferences; limited monitoring	Dual-channel multimedia learning theory; explicit phonetic instruction; teacher feedback; flexible self-paced learning
20	Sheerah and Yadav (2022)	Some students did not commit to FCM; preferred face-to-face interaction; lacked intrinsic motivation; found audio/video content boring	Pre-class Blackboard content; self-paced video review; student-directed learning; collaborative scaffolding activities
21	Ahmad (2021)	Difficult to monitor unenthusiastic online learners;	Best-of-both online and offline modalities; repeated use of

No	Authors	Challenges	Facilitating Factors
		copy-pasting in online tasks; unmotivated learners logged in only for attendance	uploaded materials; interactive offline + individualized online
22	Huang (2021)	Difficulty selecting vlog content; time-consuming editing; time pressure; no prior vlog experience; home distractions	Social constructivism/ZPD peer scaffolding; authentic real-life context; instant smartphone feedback; sense of achievement
23	Peng and Fu (2021)	Extrinsic motivation dominated over intrinsic in Chinese EFL context; job market pressure as primary extrinsic driver	Intrinsic motivation (interest, cultural understanding) more influential long-term; SDT autonomous motivation; vocabulary apps
24	Nur et al. (2024)	Sustaining virtual motivation; home distractions; feeling overlooked without face-to-face contact; variable tech comfort; unreliable internet	Responsive lecturer; interactive tools (YouTube, Instagram); structured tasks; WhatsApp Q&A support; async independent resources

Note. Data synthesized from 24 reviewed articles. F2F = face-to-face; Col = Community of Inquiry; ZPD = Zone of Proximal Development; AI = Artificial Intelligence; AR = Augmented Reality; VR = Virtual Reality; LMS = Learning Management System; FCM = Flipped Classroom Model; CEFR = Common European Framework of Reference; MABL = Mobile-Assisted Blended Learning; SDT = Self-Determination Theory.

Conclusion

This systematic review synthesizes evidence from 24 empirical studies to conclude that digital tools integrated within blended learning environments exert a measurable yet condition-dependent impact on university-level EFL students' speaking skills, with effectiveness being less a function of technological sophistication than of pedagogical intentionality and instructional design coherence. The findings confirm that Learning Management Systems, video-based tools, synchronous conferencing platforms, and social media remain the most widely adopted categories, whereas AI-powered and immersive technologies, while promising, are still nascent in blended EFL speaking contexts. In terms of speaking sub-skills, fluency and vocabulary emerged as the most consistently improved dimensions, followed by learner confidence and engagement, whereas pronunciation, accuracy, coherence, and grammar demonstrated more selective gains contingent upon specific tools, task designs, and intervention durations. Critically, the review reveals a dialectical interplay between persistent challenges, namely technical infrastructure instability, learner digital literacy gaps, inadequate teacher training, and AI's discourse-level limitations, and enabling factors such as scaffolded instructional design, immediate personalized feedback, learner autonomy, and peer collaboration.

Taken together, the evidence indicates that successful integration of digital tools for speaking instruction in blended university EFL contexts does not depend on adopting the most advanced technologies but rather on embedding tools within theoretically grounded, bichronous learning architectures that prioritize low-stakes practice opportunities, structured scaffolding, and institutional readiness. These findings contribute a hierarchical taxonomy of digital tool effectiveness across speaking sub-skills and a comprehensive typology of implementation barriers and enablers, offering a practical heuristic for practitioners and curriculum designers. For future research, longitudinal studies extending beyond typical 8–18 week interventions are urgently needed to assess whether fluency gains from AI chatbots and VR environments

translate into durable discourse-level competence, as current evidence suggests coherence remains inadequately supported. Additionally, comparative studies across diverse geographical contexts, particularly under-represented regions such as Southeast Asia, Africa, the Middle East, and Latin America, are necessary to test the generalizability of findings beyond East Asian settings.

Researchers should also move beyond single-tool evaluations toward investigating how multi-tool bichronous configurations interact with learner characteristics such as self-regulation, digital literacy, and speaking anxiety, ideally using mixed-methods designs that capture both measurable outcomes and learner perceptions. Finally, future systematic reviews would benefit from including theses, dissertations, and conference proceedings to mitigate publication bias and from conducting meta-analyses where homogeneity in outcome measures permits, thereby providing more precise effect size estimates for specific digital tool categories on distinct speaking sub-skills.

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Appendix

Analysis Matrix of Digital Tools Implementation in Blended Learning to Improve University EFL Students' Speaking Skills

No	Article Identification	Types of Digital Tools	Effectiveness	Challenges & Facilitating Factors
1	Ali et al. (2024) "The Impact of Blended Learning in Enhancing English-Speaking Skills: An Evaluation of Teachers' Perspectives"	Social media (Facebook, Messenger), educational/YouTube videos, synchronous (audio/video calls, live sessions), asynchronous (story posts)	Improves fluency, vocabulary, creativity, and real-life communication; enhances engagement, collaboration, and confidence; provides immediate feedback.	Challenges: Teachers' reluctance with tech, limited student access to devices, digital divide, non-academic social media use. Facilitating Factors: Self-learning via Google, junior-senior teacher collaboration, short training sessions, private Facebook/Messenger groups.
2	Rehman et al. (2025) "Blending Traditional and Digital Methods: Enhancing EFL Speaking Skills Beyond LMS Platforms"	AI-driven language apps (pronunciation drills), VR simulations (immersive scenarios), online speaking platforms, LMS (control group)	Significant gains in fluency (3.5→4.8) and pronunciation (3.0→4.5); increased intrinsic motivation; reduced test anxiety; enhanced self-efficacy.	Challenges: High VR cost, small sample, short duration (12 weeks), inadequate LMS for interactive speaking. Facilitating Factors: Low-stakes personalized practice, scaffolding within ZPD, immediate AI/VR feedback, teacher training.
3	Ali et al. (2023) "The Impact of a Blended Learning Approach on First-Year Arab University Students' Oral Production"	Flipped classroom (videos via G-form), video reflection (Dropbox), audio recordings, online feedback (Zoom/Google Meet), LMS	Oral production improved (3.63→4.30); experimental group outperformed control group; enhanced self-regulation, confidence, and motivation.	Challenges: Limited tech infrastructure, uneven digital literacy, initial confusion, cultural norms, lack of student preparation. Facilitating Factors: Pedagogical adaptation (flipped/reflection tasks), teacher support, multiple submission attempts, structured feedback.

No	Article Identification	Types of Digital Tools	Effectiveness	Challenges & Facilitating Factors
4	Manipatruni et al. (2024) "Synthesis of Blended Learning and Bichronous Learning in Improving Undergraduates' English-Speaking Skills Through Short Presentations"	Flipgrid (asynchronous video practice), CEFR rubrics (synchronous assessment), short presentations (JAM/seminars), WhatsApp	Significant improvement ($t=13.74$, $p<0.05$); 88% exceeded A1 post-test level; 77.8% agreed Flipgrid enabled self-paced practice; enhanced fluency, accuracy, coherence.	Challenges: Limited synchronous speaking time, small sample ($n=29$), timetable constraints. Facilitating Factors: Bichronous model combining async Flipgrid practice at home with sync CEFR feedback in class; multiple submissions reduced anxiety.
5	Khodabandeh et al. (2025) "Augmented Reality's Role in EFL Learning: Enhancing Language Skills in Clothing and Style Through Flipped and Blended Methods"	AR application (3D virtual clothing, avatar creation, background scenarios), WhatsApp, pre-task videos, QR code	Blended+AR group outperformed all groups (post-test mean 18.27); AR significantly outperformed non-AR in both models ($p<0.001$, $\eta^2=0.639/0.575$); enhanced grammar, vocabulary, and speaking.	Challenges: Limited to single institute and clothing/style topic; individual affective factors not examined. Facilitating Factors: Constructivist and inquiry-based learning, real-time teacher feedback, peer collaboration, authentic task-based scenarios with personalized avatars.
6	Pinandhita (2025) "Integrating Digital Tools and Learning Strategies to Enhance Speaking Proficiency: Mixed Methods Evidence from Indonesian EFL Universities"	MALL apps, collaborative platforms, speech recognition tools, progress tracking tools, chatbots for repetitive practice	Speaking gains of 14.32–19.14% ($p<0.001$, $d=0.82-0.94$); metacognitive+MALL most effective for fluency (+23.18%); 88.1% rated blended approach as effective.	Challenges: Internet instability (27.6%), limited device access (19.5%), early digital adaptation difficulties (14.1%), uneven infrastructure. Facilitating Factors: Explicit strategy training, active feedback adaptation, teacher mediation, peer interaction, scaffolding, learner autonomy.
7	Sari et al. (2021) "Effectiveness of Blended Learning in English Speaking Skill for Undergraduate in 4.0"	Learn Social LMS (Language Centre, University of Sumatera Utara), Individual Rotation Model, online level tests, Google Forms	Post-test mean (87%) exceeded pre-test (85%); 90% of students gave positive responses; improvement in vocabulary, grammar, and comprehension.	Challenges: Low student attendance (only 42/62 completed questionnaire), some missed test deadlines. Facilitating Factors: Individual Rotation Model (flexible time/path/pace), automatic scoring, alignment with digital-native needs and COVID-19 context.

No	Article Identification	Types of Digital Tools	Effectiveness	Challenges & Facilitating Factors
8	Mohammadi et al. (2021) "The Effect of Face-to-Face Verses Online FLIP Learning on the Speaking Skill of Lower-Intermediate Iranian University EFL Learners"	Adobe Connect (synchronous online), pre-recorded video lectures, Huang & Gui's Speaking Rubrics, Oxford Placement Test	Both FLIP modes significantly improved speaking ($p < 0.05$); face-to-face FLIP outperformed online FLIP (mean 13.00 vs. 11.87, $\eta^2 = 0.237$); larger effect size for face-to-face.	Challenges: Limited online collaboration, technical issues (slow internet, software), requires high self-discipline, unequal device access. Facilitating Factors: Four FLIP pillars (flexible environment, learning culture, intentional content, professional educator); easier pair/group work face-to-face.
9	Ariani et al. (2023) "The Implementation of Project Based Learning in Blended Learning System to Improve English Speaking Skill of Polytechnic Students"	WhatsApp Group (discussion/monitoring), Zoom Meeting (conferencing), Google Classroom (submission), video recording (speaking projects)	Pre-test (58.7) → Cycle 1 (63.5) → Cycle 2 (70.1); 'Very Good' category rose from 0% to 20.8%; improved vocabulary, fluency, pronunciation, and creativity.	Challenges (Cycle 1): Pronunciation difficulties with technical vocabulary, poor audio quality, unequal speaking turns, short video duration. Facilitating Factors: Student-chosen topics, group work reduced anxiety, flexible online environment, authentic PBL tasks.
10	Tabassum and Saad (2024) "Community of Inquiry as an Instructional Framework: How Teaching, Social and Cognitive Presences Impact EFL Speaking in a Blended Setting in Bangladesh"	Facebook Groups (Col activities), Google Classroom, WhatsApp Groups, institutional LMS, video/audio calls, native speaker audio/video recordings	Boosted motivation, confidence, and peer collaboration; social presence enhanced speaking proficiency; teaching presence improved deliberate practice; cognitive presence fostered critical thinking.	Challenges: Need for teacher training in tech/pedagogy, insufficient institutional support, misaligned traditional assessment, student resistance. Facilitating Factors: Col framework (teaching, social, cognitive presences), professional development, inquiry-based collaborative activities.
11	Rahmawati (2022) "Investigating EFL Teachers' Approaches to Meaningful Learning in Blended-Learning Listening and Speaking Courses"	Offline: lectures, discussions, role-play, job-interview simulation. Online: LMS, Zoom/MS Teams, Kahoot!, Padlet, vlogs, podcasts, Anchor app	Meaningful learning through varied offline and online modes; self-access materials enabled autonomous learning; project-based assessments (vlogs, podcasts) provided authentic language production.	Challenges: COVID-19 forced full-online shift; slow/unstable internet. Facilitating Factors: Activities aligned to objectives, students' needs, and real-life contexts; encouragement of student-centered/autonomous learning; flexibility in time and place.

No	Article Identification	Types of Digital Tools	Effectiveness	Challenges & Facilitating Factors
12	Mortaji (2022) "Public Speaking and Online Peer Feedback in a Blended Learning EFL Course Environment: Students' Perceptions"	Video-based course blog (speech uploads, peer feedback), Jenzabar LMS, Turnitin (outlines, plagiarism), YouTube speech samples, camera	100% enjoyed BL model; 90% improved posture, eye contact, voice; 95% learned value of structured outlines; 85% earned >B+; peer feedback enabled self-correction and learning from peers.	Challenges: Slow internet, 5% reluctant to share all speeches online, anonymous comments required deletion. Facilitating Factors: Face-to-face theory sessions, netiquette instruction, 10% grade for online interaction, weekly instructor monitoring, familiar LMS/Turnitin.
13	Lai (2026) "AI in EFL Blended Learning: Impact on Speaking Performance and Learning Resilience"	ChatGPT (interactive speaking tasks, oral practice, feedback), Google Gemini (brainstorming, idea organization), task-based learning framework	Significant gains in pronunciation ($p=.007$, $\eta^2=.07$) and accuracy ($p=.010$); overall speaking improved ($p=.007$); metacognitive and social resilience significantly enhanced.	Challenges: Fluency unchanged (cognitive interruptions from real-time AI feedback); coherence unimproved (AI provides sentence- not discourse-level support); AI lacks contextual sensitivity. Facilitating Factors: Task-based integration (ChatGPT for interaction, Gemini for planning), free/accessible tools, structured 18-week intervention.
14	Zhou et al. (2025) "Supporting English Speaking Practice in Higher Education: The Impact of AI Chatbot-Integrated Mobile-Assisted Blended Learning Framework"	ChatGPT-4 (voice conversation, real-time feedback, personalized dialogue), Chaoxing MLMS (resources, assignments, forums), MABL framework	Experimental group outperformed control in fluency ($M=3.07$ vs. 2.51 , $r=0.717$) and total scores ($p=.015$); high TAM acceptance ($M=4.06/5$); 24/7 chatbot access reduced anxiety.	Challenges: Accuracy/complexity unchanged (8-week intervention too short); room for peer collaboration improvement; small single-institution sample. Facilitating Factors: MABL flexibility, personalized AI feedback, high ease of learning ($M=4.18$), reduced cognitive load.
15	Wang (2021) "Employing Blended Learning to Enhance Learners' English Conversation: A Preliminary Study of Teaching with Hitutor"	Hitutor online platform (one-on-one native speaker tutoring, 17 countries, 25-min sessions, placement test, mobile/computer access), face-to-face classroom	Overall post-test (3.64) > pre-test (3.41) ($p<.05$); groups B and C (lower proficiency) improved significantly; high satisfaction ($M=4.11/5$); students agreed listening/speaking improved ($M=3.76$).	Challenges: Non-transparent placement rubric, short 18-week implementation, difficulty monitoring individual online learning, limited supportive materials for face-to-face. Facilitating Factors: One-on-one native speaker tutoring, flexible scheduling, regular

No	Article Identification	Types of Digital Tools	Effectiveness	Challenges & Facilitating Factors
				participation requirement (12 sessions).
16	Ha (2024) "Exploring Metaverse-Blended Learning in an English Presentation Class: Student Perceptions"	Gather Town (metaverse: 2D interface, avatar interaction, spatial audio, podium, screen sharing, virtual group rooms), LMS, smartphones/computers	High satisfaction (M=3.71/5); seamless interaction (M=3.85); reduced presentation anxiety (M=3.75); speaking anxiety, metaverse interest, and English proficiency significantly predict anxiety reduction ($R^2=0.931$).	Challenges: Limited/outdated internet facilities (n=9), school policy blocking external sites (n=3), metaverse unfamiliarity, small sample (n=24). Facilitating Factors: User-friendly 2D interface, avatar-mediated pressure reduction, podium feature, spatial audio, gamification elements.
17	Fischer and Yang (2022) "Flipping the Flipped Class: Using Online Collaboration to Enhance EFL Students' Oral Learning Skills"	Google Hangouts on Air (synchronous video conferencing, screen sharing, recorded sessions), university LMS (video lessons, quizzes), mock IELTS oral tests	Proposed flipped group (PFG) outperformed regular flipped (RFG) (M=5.53 vs. 5.00, $p=.017$); PFG spent 4x more time online; higher quiz scores and final grades; total online time correlated with outcomes.	Challenges: RFG had low accountability and came to class unprepared; RFG underperformed traditional class; small sample (N=54). Facilitating Factors: Col framework (social/cognitive/teaching presences), peer-instruction pressure, instructor monitoring of recorded sessions, synchronous collaboration reduced isolation.
18	Muluk et al. (2025) "The Impact of Synchronous Virtual Flipped Classroom on EFL Students' Speaking Skill"	Zoom (synchronous virtual classroom, screen sharing, hand raising, whiteboarding), WhatsApp Group (async pre-class discussions), instructional videos, Google Classroom/Canvas	Speaking improved significantly (Assessment I M=70.24 → Assessment V M=81.96, F=36.88, $p=.000$); reduced anxiety in virtual vs. physical classroom (M=3.85); increased self-confidence (M=3.57).	Challenges: Inadequate social presence vs. face-to-face, technical issues (internet, background noise), difficulty reading non-verbal online cues. Facilitating Factors: Modified flipped model (WhatsApp async + Zoom sync), flexible time management, engaging videos, digital-native students, learner autonomy.
19	Pu and Chang (2025) "Effects of Different Input Modes on Blended EFL Speaking Instruction: A	i-Learning platform (college-developed), bimodal input (text + audio), multimodal input (text + video + captions), face-to-face (60 min/week),	Both bimodal and multimodal groups significantly improved speaking ($d \approx 2.58$ for read-aloud); no significant	Challenges: High need for self-autonomy (60% of interviewees reported concern), caption distraction in multimodal, individual input-mode preferences, limited

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	Quasi-Experimental Study"	online self-learning (120 min/week)	difference between groups; multimodal showed advantage in self-efficacy ($p=.022$).	monitoring. Facilitating Factors: Dual-channel multimedia learning theory, explicit phonetic instruction, teacher feedback, flexible self-paced learning, downloadable online materials.
20	Sheerah and Yadav (2022) "An Analytical Investigation of Flipped Classroom to Improve Saudi EFL Learners' Speaking Skills: A Case Study at Applied College"	Blackboard LMS, podcasts and vodcasts, YouTube, online dictionaries, Google Translate, TED talks, WhatsApp group, tri-model (hyflex/flipped), online discussion forums	Flipped classroom significantly improved speaking fluency and confidence; 62.5% found speaking fun; 50% performed better academically; FCM self-reportedly developed speaking by 40%; reduced shyness and anxiety.	Challenges: Some students did not commit to FCM, preferred face-to-face interaction, lacked intrinsic motivation, found audio/video content boring or difficult. Facilitating Factors: Pre-class BB content, self-paced video review, student-directed learning, collaborative scaffolding activities.
21	Ahmad (2021) "A Blended Approach to Teaching Language Skills: An Empirical Study"	Blackboard Collaborate Ultra, TOEFL Mastery, Rosetta Stone, Sounds American, CALL programs, vocabulary/reading/writing software (MacReader, Sentence Maker, WORDREDAY), Digital Play app	95% of teachers agreed blended approach is more effective than fully online or offline; 95% of learners preferred 70% offline + 30% online; 80% agreed blended serves both regular and working learners.	Challenges: Difficult to monitor unenthusiastic online learners (80% of teachers agreed); online students copy-pasted writing tasks; unmotivated learners logged in only for attendance. Facilitating Factors: Best of both online and offline; repeated use of uploaded materials; autonomous and lifelong learning; interactive offline + individualized online.
22	Huang (2021) "Effects of Smartphone-Based Collaborative Vlog Projects on EFL Learners' Speaking Performance and Learning Engagement"	Smartphones (audio-video recording, iMovie/PowerDirect or video editing), collaborative vlog projects (scriptwriting, filming, narration), Schoology LMS, YouTube, Instagram	Significant speaking improvement ($57.62 \rightarrow 67.54$, $d=1.46$, extremely large effect); increased fluency, vocabulary, confidence; 100% enjoyed project-based tasks; developed 21st-century digital media skills.	Challenges: Difficulty selecting vlog content, time-consuming editing, time pressure, no prior vlog experience, home distractions. Facilitating Factors: Social constructivism/ZPD peer scaffolding, authentic real-life context, instant smartphone feedback, sense of achievement from completion.

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23	Peng and Fu (2021) "The Effect of Chinese EFL Students' Learning Motivation on Learning Outcomes Within a Blended Learning Environment"	New Horizon College English Platform, MOOCs, NetEase Online Open Courses, Youdao Dictionary, BaiCizhan (vocabulary apps), WeChat	Both intrinsic ($\beta=0.42-0.57$) and extrinsic motivation ($\beta=0.10-0.13$) positively predict learning outcomes; intrinsic motivation has stronger impact; vocabulary improved most ($M=4.05/5$).	Challenges: Extrinsic motivation dominated over intrinsic in Chinese context; job market pressure as primary extrinsic driver. Facilitating Factors: Intrinsic motivation (interest, cultural understanding) more influential long-term; SDT autonomous motivation; vocabulary apps for self-paced learning.
24	Nur et al. (2024) "Student Engagement Dynamics in Hybrid English Speaking Classes: A Study on Synchronous and Asynchronous Learning in Indonesia"	Google Classroom (async: materials, assignments, Q&A), WhatsApp groups (sync: real-time Q&A, feedback), Zoom/Google Meet, YouTube, Instagram	Improved cognitive, behavioral, and emotional engagement; increased fluency and confidence; reduced online pressure/anxiety; hybrid learning effective when addressing all three engagement dimensions.	Challenges: Sustaining virtual motivation, home distractions, feeling overlooked without face-to-face, variable tech comfort, unreliable internet/infrastructure. Facilitating Factors: Responsive lecturer, interactive tools (YouTube, Instagram), time-constrained structured tasks, WhatsApp Q&A support, async resources for independent review.