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AI-DRIVEN APPROACHES TO ADVANCE SPEAKING PROFICIENCY IN LMOOCS: INSIGHTS, INNOVATIONS, AND PEDAGOGICAL IMPLICATIONS

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Abstract: LMOOCs, or Language Massive Online Open Courses, which are a fairly novel contribution to the plethora of online resources readily accessible for language instruction, have been permeating academic institutions in recent years. Regardless, concerns over developing the speaking skill of a substantial demographic of EFL learners on LMOOCs persist hitherto. Relative to other linguistic skills, speaking necessitates real-time interaction, personalised feedback, and sustained engagement to ensure enhancement; the very elements that are challenging to attain given the abundant numbers of LMOOC participants compared with limited instructor availability. The significance of this research lies in its attempt to orient instructors towards the most effective Artificial Intelligence (AI) tools to enhance speaking proficiency in online learning settings; by extension, transfer them into LMOOC context. The current research aims in unveiling AI tools tailored to key speaking sub-skills (linguistic competence, oral fluency, interaction, and production) found in the growing volumes of research literature while also addressing core issues such as learner motivation, automated feedback, and interactive speaking practice. Adopting a systematic literature review approach, this research examines a total of (N=53) papers from four major academic databases (Scopus, ScienceDirect, JSTOR, and SpringerLink). The span of the extracted data for the systematic literature review covers 5 years, from 2019 to 2024. The results provide teachers and course designers with a road map for creating more dynamic, responsive, and effective LMOOC experiences for EFL learners to solve problems related to learner engagement, personalised feedback, and interactive practice through incorporating AI tools. They also offer actionable insights into AI integration strategies into LMOOC framework.

Keywords*:* Artificial Intelligence (AI) tools; EFL learners; LMOOCs; personalised feedback; speaking proficiency

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1. Introduction

The contemporary expanding world, where global language exchanges are perpetually dominated by English, its appeal as a teaching tool is noteworthy. Approximately 1.75 billion speakers of English exist on this planet, as per Statista (2023), the demand of constantly supporting quality EFL training to advance the speaking proficiency for academic, professional and social situations is in constant elevation. The surging wave of digital innovations provides fertile ground for technology in education, particularly EFL instruction. The latter has gone through remarkable transformation permeating the dynamics of language teaching/learning driven by technological developments. Audiovisual materials, language labs and computer-based language learning (CALL) which profer personalised, adaptive learning technologies (González-Lloret, 2024) have been deployed to elevate the effectiveness of EFL teaching (Zheng, 2024).

The rapid expansion of digital education has transformed traditional pedagogical approaches to EFL instruction, especially along the emerging of MOOCs as a leading force in reshaping the landscape of education via providing unrestricted access to high-quality learning resources. Part of MOOCs are Language MOOCs, abbreviated as LMOOCs. Compared to online language learning settings, five features supported LMOOCs' development: flexibility and diverse instructional materials, unlimited enrollment, student-centered learning, structured progression, and immersive language environments (Yang & Wei, 2023). These courses have been made available for all learners around the world which empowers them through fostering autonomy and exposure to authentic language input; thus, LMOOCs have widely become a promising avenue for language education in an increasingly globalised world (Huang, 2024; Procel et al., 2024). Although LMOOCs have proven effective in developing receptive skills such as reading and listening, their ability to enhance productive skills, specifically the speaking skill, remains a subject of concern (Marrero-Aguiar, 2021; Mondo & Storico-Artistiche, 2024).

Speaking proficiency, particularly, in a foreign language such as EFL requires continuous practice combined with real-time feedback; the very elements that are difficult to reproduce in massive learning settings, say LMOOCs (Appel & Pujolà, 2021). Traditional LMOOCs often rely on static content delivery, such as recorded lectures and multiple-choice assessments, which fail to provide the interactive engagement necessary for developing fluency, pronunciation, and spontaneous speech production (Sallam et al., 2020). The limited instructor presence in LMOOC environments compared with the massive numbers of participants induces reduction -to total absence- of individualised feedback, which in turn exacerbate the challenges to foster oral proficiency (Dinh & Phuong, 2024). Lower learner motivation and engagement are then ineviatable outcomes. These issues stress the need for innovative pedagogical interventions that can bridge the gap between the accessibility of LMOOCs and the particular requirements of spoken language acquisition.

In recent years, AI has permeated language pedagogy in almost all educational levels. AI-driven technologies are numerous ranging from platforms to applications, including speech recognition systems, conversational agents, gamification elements, and dynamic assessment tools. They have the potential to revolutionise LMOOCs since they offer personalised, interactive, and adaptive learning experiences (Bachiri et al., 2023; Chong et al., 2022). LMOOCs have evolved alongside the development of the Web technologies; it transitioned from the static nature of Web 1.0 to the interactivity of Web 2.0 and now it has the potential to integrate AI-driven features of Web 3.0. These tools improve learners' engagement and offer real-time feedback, pronunciation analysis, and simulated conversation practice, all of which address the fundamental limitations of traditional LMOOCs (Kennedy et al., 2023; Nguyen, 2024). Online education has witnessed a sweeping integration of AI

technologies in an increasing rate; research on its specific impact on speaking proficiency within LMOOCs remains underexplored. The majority of existing studies primarily focus on general MOOC engagement, instructional design, and completion rates; only fewer investigations have examined the way AI-powered solutions can facilitate oral language development in LMOOCs (Chiappe & Amaral, 2021).

This study seeks to address this gap through examining the role of AI-powered tools in enhancing speaking proficiency within LMOOCs to address the currently existing challenges in that matter. Through a systematic analysis of AI-driven interventions, the research evaluates their effectiveness in improving linguistic competence, fluency, and communicative confidence in EFL context. The findings will identify effective AI technologies to enhance learners' speaking skills; meanwhile, AI tools that provide adaptive feedback, foster immersive interaction, and sustain learner motivation for EFL speaking profieciency will be discussed. The current research suggests pedagogical implications of integrating those AI tools into online language instruction in LMOOCs to enhance teaching/learning the speaking skills, which highlights their potential to redefine learner autonomy, engagement, and personalised learning in LMOOC frameworks. By offering empirical insights into the efficacy of AI-driven approaches, this research provides valuable recommendations for educators, course designers, and policymakers striving to optimise LMOOCs for productive language skills, namely the speaking skills.

2. Literature Review

2.1 AI in EFL Instruction

AI is continuously permeating every aspect of human existence, but in recent years, its use in education has grown dramatically, including language education. AI tools have proliferated by virtue of the personalised learning experiences they supply for learners. Natural language processing and machine learning algorithms, as inherent components of AI, offer EFL learners real-time feedback and personalised learning practice adjusted for learners' requirements and styles (Jegede, 2024). Various AI applications have been widely harnessed in EFL context and are exerting profound impacts thanks to immediate feedback which positively influences EFL learning outcomes (Li et al., 2018). The ever developing field of AI brings about an upheaval of differing teaching modes offering learners immersive and engaging experiences that have the potential to emulate real-life communication. For instance, AI chatbots and virtual tutors propose conversational practice which has the potential of addressing a major challenge in language teaching/learning- limited language practice chances for enhancing the speaking skill (Nguyen & Pham, 2024). This particular field has promising contributions to enhance the efficacy of EFL instruction, rendering it more engaging and effective simulataneously.

In their detailed literature review Alshumaimeri and Alshememry (2023) discussed how the application of AI may have a significant impact on English language proficiency. They thoroughly described the effects of the latest AI applications on each language skill. They argued that there are indisputable advantages to using AI technology into English language instruction to enhancing the four skills. Yang (2020) found out that using AI in EFL instruction could offer pupils quick, precise support, which is an essential component of individualised learning and a necessary prerequisite for contemporary instruction. Evidence from his research implies that the primary goal of acquiring spoken English as a speaking subskill is to achieve proficient communication. To further facilitate collaboration, educators and learners may create groups, work together, and practice online.

According to Chen et al. (2021), human educators cannot compete with AI-powered technologies and the automation they offer. These technologies, including platforms and applications (Duolingo, virtual reality (VR), machine translation (MT), speaking/writing assistants, chatbots, and intelligent tutors), are so adaptable and sophisticated that teachers' efforts to teach language skills, speaking included, are far surpassed if compared with them. In this regard, Pokrivcakova (2019) expressed identical thoughts in her study. She reported that it was unplausible, if not impossible, for educators to regularly assess the work of every learner in EFL—speaking primarily—identify their particular learning needs, adapt the course content accordingly, and deliver thorough feedback in barely any time, certainly not in an environment with hundreds of other students.

The speaking sub-skills like pronunciation, vocabulary accuracy, fluency, linguistic competence and the like are better supported using AI platforms and applications. Teachers could attend to the needs and proficiency levels of every single learner without the obligation of going through exhausting and time-consuming efforts to meet those varied needs, styles and proficiency levels (Dale, 2016). According to Dale (2016), communication skills along with other speaking skills are better developed through the latest AI technologies of speech recognition, language processing and language translation softwares, all of which must be well-known to educators. Shazly (2021), similarly, emphasised the role of AI technologies in enhancing the speaking proficiency of learners by providing human-like conversation tasks, interacting with these learners as a human companion would eliminating any potential embarracement while conversing and improving their EFL oral skill. Hence, employing AI to enhance the speaking proficiency reaps its utmost benefits for students and teachers jointly.

2.2 The Advent of MOOCs for EFL Learning

High-quality education has become available with the arrival of MOOCs for all learners around the globe, especially in tertiary levels, altering teaching and learning practices - traditional or online - which democratised the very act of education. MOOC platform providers like Coursera, edX, and FutureLearn as well as renowned universities offer countless courses in almost all educational domains for any interested student free of cost and open for all. These MOOC platforms offer learners a chance to access courses flexibly and autonomously surpassing all limitations geographical and institutional (King & Lee, 2022). To accommodate to the different time zones in the world and the varying learning styles and needs, MOOCs make use of diversified approaches, materials and media. Videos, quizzes, discussion forums are widely used within MOOC frameworks for the purpose of ensuring effective individual and collaborative learning engagement (Bonk et al., 2018).

Language learning demanded its share in MOOCs. Due to persistent emphasis on more interactive language learning for all, LMOOCs came into existence in 2012 as a radical turn in the entire online language instruction. These LMOOCs unified the characteristics of MOOCs and the latest language learning pedagogies (Martín-Monje & Bárcena, 2014). As a result, LMOOCs gained popularity over existing MOOCs in other fields of specialisation, creating hype among individuals seeking to learn English or other languages (Hidalgo et al., 2020). Language learners' interest and motivation to undertake these courses was fueled by the capacity of LMOOCs to provide rich resources and self-paced learning. The advancement of LMOOCs has its own impact on education in general and online education in particular which brings attention to the significance of these platforms in the modern era whether for individual or collaborative learning in attaining language mastery.

LMOOCs are described in previous studies not to be exempt from negative aspects, despite the immeasurable benefits they are commonly recognised for. In his research, Hsu (2021) provided elaborate insights into benefits as well as concerns regarding LMOOCs. The

two most often cited advantages are a relaxing atmosphere and adaptability. Encounters between individuals may enhance learners' communication ability, and LMOOCs are seen to be the ideal setting for this. However, it still seems to be difficult to foster sufficient socialisation in these digital settings. As far as the concerns surrounding LMOOCs, Hsu (2021) named a few. One of the biggest problems facing all MOOC designers is an elevated rate of dropouts. A substantial percentage of students dropping out nonetheless causes many to reevaluate the usefulness of MOOCs, even if it is unreasonable and erroneous to judge an educational program's worth just by its completion rate, calling for further developments to be made on LMOOCs to make them more interesting.

Hsu (2021) further explained that learning languages is both skill-based and content-based which necessitates LMOOC designers to care for various types of skills to increase effectiveness and sustainability. Following this line of thought, Vorobyeva (2018) elaborated on the suitability of LMOOCs for enhancing receptive language skills (reading, listening) compared to the rising problems concerning productive skills (majorly speaking, writing to a lesser extent) since the speaking skill requires personal attention to each learner with suitable language practice and individual feedback. Reduced completion and engagement rates have been observed in LMOOC research for various explanations, be them those or others. There are still barriers that LMOOCs have to conquer further afield to enhance language skills instruction, top of which is the speaking skill.

Expounding on this idea, language materials are more readily accessible on LMOOCs for teaching reading, writing, and listening skills due to the nature of these language skills. Reading resources; texts, books, articles and other materials, can be accessed online and the reading tasks are easily assessed either manually or automatically (González-Lloret, 2014). As for teaching the writing skill on LMOOCs, writing assignments are both deliverd and submitted online. Feedback can be provided to these assignments via peer or automated assessment (Hyland & Hyland, 2006). Developing the listening skill can be reached through the extensive use of audio recordings, videos, and interactive listening exercises (Woottipong, 2014). The fourth skill, the speaking skill, suffers impeding challenges within LMOOCs for it is still insufficient in providing real-time interactions for massive participants nor does it succeed in delivering individualised and immediate feedback which are burdensome to supply in a huge virtual space (Bahari, 2020). Zhu et al. (2018) noted that some LMOOCs have endeavoured multiple times to incorporate oral practice through discussion forums or video submissions; nonetheless, they encountered problems regarding students' participation, engagement and low-quality assessments.

Technology may well offer solutions to the concerns expressed by multiple scholars regarding the speaking skill challenges faced by both teachers and learners on LMOOCs. Naseer et al., (2024) proposed AI apps and chatbots capable of replicating real-life conversations which helps learners find language partners with whom they constently practice their speaking skills until mastery beyond the stresses and limitations of human interactions. While several studies investigated the merits and demerits of online synchronous or asynchronous conversations in presentations, discussion forums, or vide-conferencing to enhance the speaking skills on LMOOCs; scare literature if none, to the researchers current knowledge, has attempted to delve into creative solutions as the effective implementation of particular AI tools. This gap in the literature on LMOOCs, specifically in the possibility of creating language learning environments which support the speaking skill through the latest technological creations, say AI, stresses the urgency to probe the integration of AI within LMOOCs to improve learning/teaching the speaking skills.

3. Methodology

The eminent significance of the current research lies in its potential to solve the challenges of teaching the speaking skill on LMOOCs. Hence, it contributes largely to theoretical advancements and practical applications of AI in language teaching, particularly teaching the speaking skill on LMOOCs which face limitations in the capacity to offer individualised support to massive numbers of EFL learners. Through identifying effective AI tools for enhancing the speaking skill, the research provides more engaging language learning environments. The research, then, is relevant and impactful in its field consolidating which AI tools have the utmost impact on EFL speaking skills- fluency, interaction, and production. These findings will hopefully add to the literature and equip educators with more sophisticated teaching tools within or outside LMOOC frameworks. For the students, AI provides them with targeted feedback and practice, enhancing engagement and performance. This research, in turn, helps to transform LMOOCs into more pedagogically relevant, learner-driven tools that can help translate language learning to the new digital era.

In this regard, the research grounded in a systematic literature review endeavours to explore and identify effective AI tools from the previous yet most recent studies to be incorporated within LMOOC structures to enhance EFL speaking skills. The starting aim is to uncover AI tools utilised in EFL teaching off LMOOCs demonstrating effectiveness in improving the seaking sub-skills: linguistic competence, oral fluency, interaction, and production. Second is to evaluate the way the identified successful tools advance the speaking skill in general and the sub-skills in particular. The final aim focuses on actionable insights suggested to coherently integrate specific AI tools to address specific speaking skills. Viewed comprehensively, this research potentially resolves issues relevent to learner engagement, personalised feedback, and interactive practice. It aspires to suggest feasible and effective pedagogical implications which may alter LMOOC framewoks into a far more effective and interactive platform which appeals to twenty-first-century EFL learners.

In light of the above theoretical considerations, the ensuing set of research questions will be comprehensively explored:

1. What specific AI tools are currently utilised to enhance the speaking skill in EFL learning/ teaching?

2. What AI tools identified in the literature have effectively enhanced specific speaking sub-skills—linguistic competence, oral fluency, interaction, and production—in EFL learners?

3. In what ways can AI applications suggested from the literature be integrated into LMOOC frameworks to improve EFL learner engagement and provide personalised feedback for speaking skills development?

A systematic literature review is selected as the methodology for this research for its suitability to reveal the existing dearth of studies examining the use of AI in EFL instruction within LMOOCs, especially in relation to pedagogical and ethical implications from the existing research in this matter beyond LMOOCs. This literature review endeavours to offer a concise yet insightful synthesis of AI tools within the EFL context, by encapsulating and elucidating the role of these tools, their effectiveness in enhancing the speaking skills of EFL learners, and ways to be deployed within LMOOCs. Eventually, barriers from technological and teachers' perspectives regarding the speaking skills within LMOOCs, along with potential avenues for future research, are explored, with the aim of yielding new perspectives. By definition, A systematic literature review is a clear and methodical approach for finding, examining, and summarising all published and registered research articles to answer specific questions (Dewey & Drahota, 2016). Thus, the Preferred Reporting Items for Systematic

Reviews and Meta-Analyses PRISMA 2020, approved by Page et al. (2021), is utilised as a framework to optimise the efficacy of the search procedure. It ameliorates comprehension, openness, and robustness of the current research while it also reduces bias chances.

3.1. Search Procedure

An automated method was employed to first gather relevant publications from 2019 to 2024 to limit the scope of this study to the most recent AI tools being used in EFL classes. Four databases (i.e., Scopus, ScienceDirect, JSTOR, and SpringerLink) were selected for searching AI-related terms ((“artificial intelligence” OR “AI” OR “natural language processing” OR “speech to text” OR “voice recognition system”)) and EFL-related terms ((“speaking skill” OR “oral skill, language” OR “pronunciation” OR “fluency” OR “communication” OR “interaction”) AND ((“EFL” OR “EFL teaching” OR “EFL learning” OR “English language”)). These databases are chosen as the source of the literature to be reviewed for they contain a comprehensive collection of rigorous research. Drawing on this particular idea, the literature selected excluded many research types like editorials, opinion pieces, serials, book chapters and dissertations to maintain a credible review void of bias following the primary aim of the literature research being summarised in its attempt to deliver an exhaustive, neutral, and fact-based examination of the relevant literature on a given topic (Zhai & Wibowo, 2023).

3.2 Inclusion and Exclusion Criteria

The inclusion and exclusion criteria are established to guarantee that the reviewed literature is both relevant and current. Based on the publication of hundreds of documents, the following inclusion and exclusion criteria are formulated and presented in Table 1.

Table 1.

Inclusion and Exclusion Criteria

Included Research	Excluded Research
- Articles published in English language. - Primary studies, research articles, and conferences that are relevant to the study. - Articles relevant to the research topics, keywords, and with open access. - Articles published within 2019-2024 range.	- Articles written in other language than English. - Articles that did not answer or adequately define the research topic. - Articles out of context and non-correlating with the objectives. - book chapters, dissertations, serial, editorial. - Articles before 2019.

3.3 Data Extraction

As part of the screening process, abstracts and titles were assessed for alignment with the research topic and the methodology of the literature review. Papers that are not pertinent are found and eliminated using this procedure. Analysis and review were performed on the rest of the papers, theoretical works, and empirical research, generating a total final number of relevant papers (n=53). Based on the PRISMA 2020 flow diagram, Figure 1 illustrates the extraction process of locating and choosing pertinent research (Page et al., 2021). A total of 574 records from 2019 to 2024 were identified from four databases (ScienceDirect=482, SpringerLink=69, JSTOR=17, Scopus=6). After removing duplicates 353 records remained. After reviewing the titles and abstracts, 161 studies not associated with language learning, such as those in computer science and healthcare, were excluded, leaving a total of 192 articles. To avoid any gaps, research that addressed EFL language skills beyond speaking were included as long as they also touched on any of the speaking sub-skills. However,

articles that centered on languages apart from English were left out if they did not pertain to learning the English language. Following a thorough review of the texts, 139 papers were removed according to these criteria:

1. Papers that concentrate on English-language cases not involving EFL (n = 46).

2. Commentaries, serials, and dissertations (n = 11).

3. Papers not discussing the use of AI applications and tools or advanced tool non AI-driven (n = 32).

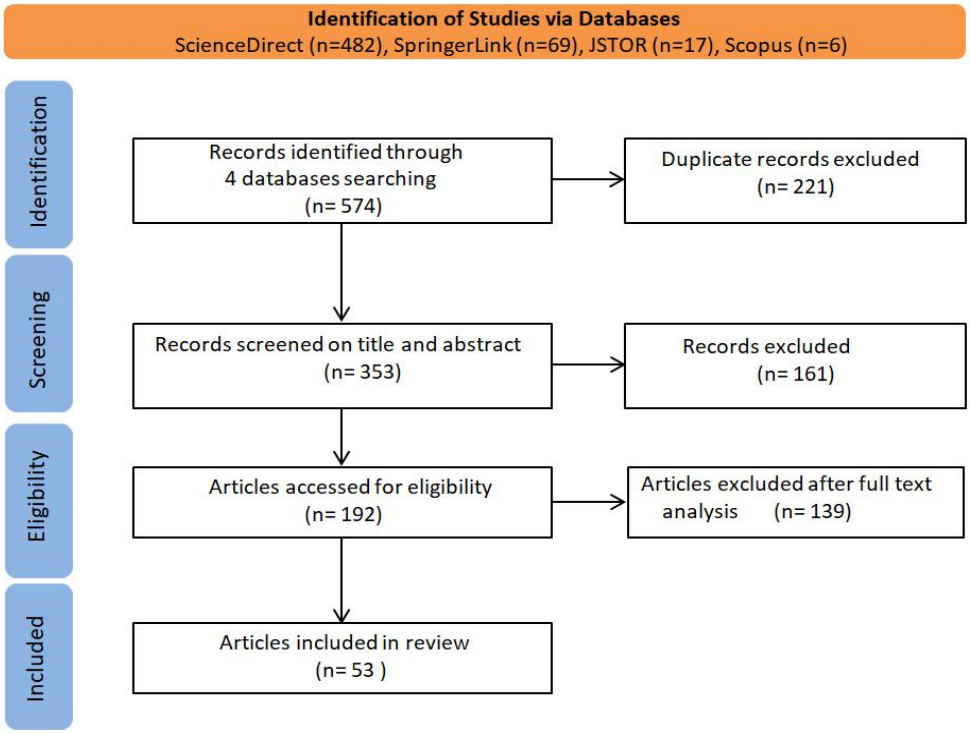
4. Papers composed in other languages than English (n = 4).

5. Articles focusing on learning languages in general not specific to English (n = 46).

53 papers were subsequently selected for this research.

Figure 1:

PRISMA Flow Diagram Describing the Selection Process



3.4. Coding Framework and Analysis Procedure

After completing data collection, the coding and analysis framework will facilitate a systematic evaluation of literature on AI tools for enhancing speaking skills in EFL learners. This framework will categorise studies along two primary dimensions: types of AI tools used (e.g., speech recognition, conversational agents, gamification, etc.) and the specific speaking sub-skills targeted (such as linguistic competence, oral fluency, interaction, and production). Thematic analysis will then be conducted, starting with familiarisation with the data to fully understand its content and context. These codes will be synthesised into broader themes, including the effectiveness of AI applications and targeted sub-skills. Each theme will be clearly defined and thoroughly analysed, with connections drawn to the literature findings and implications for EFL teaching.

4. Results

4.1. Types of AI Tools Investigated

In this research, among the 53 papers fully analysed, numerous were directed towards a more general overview of the impact of AI on EFL speaking skills. These broad papers fall into two categories, perception-based studies seeking educators' and learners' perceptions and attitudes on the general impact of AI tools on EFL speaking skills (Imran et al., 2023; Kim & Su, 2024; Sayed et al., 2024; Yang et al., 2024b; Zhi & Wang, 2024), and literature reviews conducted on various time spans which provided an overall idea of the available AI tools including generative AI (Law, 2024; Waluyo & Kusumastuti, 2024; Zhai & Wibowo, 2023), chatbots (Du & Daniel, 2024; Jeon et al., 2023; Hwang et al., 2022; Van Den Berghe et al., 2019), Extended Reality (XR) such as Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR) (Luo et al., 2023; Rahman et al., 2024; Zhang & Umeanowai, 2024) and their positive influence on language learning including the speaking skill without any operational details of any specific tool (Hwang et al. 2022; Metruk, 2024; Rusmiyanto et al. 2023; Tolstykh & Oshchepkova, 2024; Wang, 2023). Neither perception-based studies nor literature reviews specified the AI tool/s under investigation; rather AI tools were mentioned in a more of general statement. The other studies evaluated the influence of AI on enhancing EFL speaking skill in different countries. Major papers examined: speech recognition systems such as ILI, NOVO, EAP Talk, ELSA and Duolingo; conversational agents ChatGPT, DEBO and other AI chatbots; gamification systems such as Duolingo, ELSA Speak and Quizziz; and dynamic assessment softwares such as Cake and Comuniqa. Some AI tools were not classified; therefore, they were grouped in the General AI TOOLs column. Figure 1 briefly names the AI tools found in all the remaining studies divided into four main categories. A more detailed table, table 2, is then provided to explain the functionality of each AI tool. The results summarise the key findings in the studies, ranging from improving pronunciation and vocabulary to enhancing interaction and engagement in speaking practice.

Figure 2:

Categories of AI Tools Used for the EFL Speaking Skil

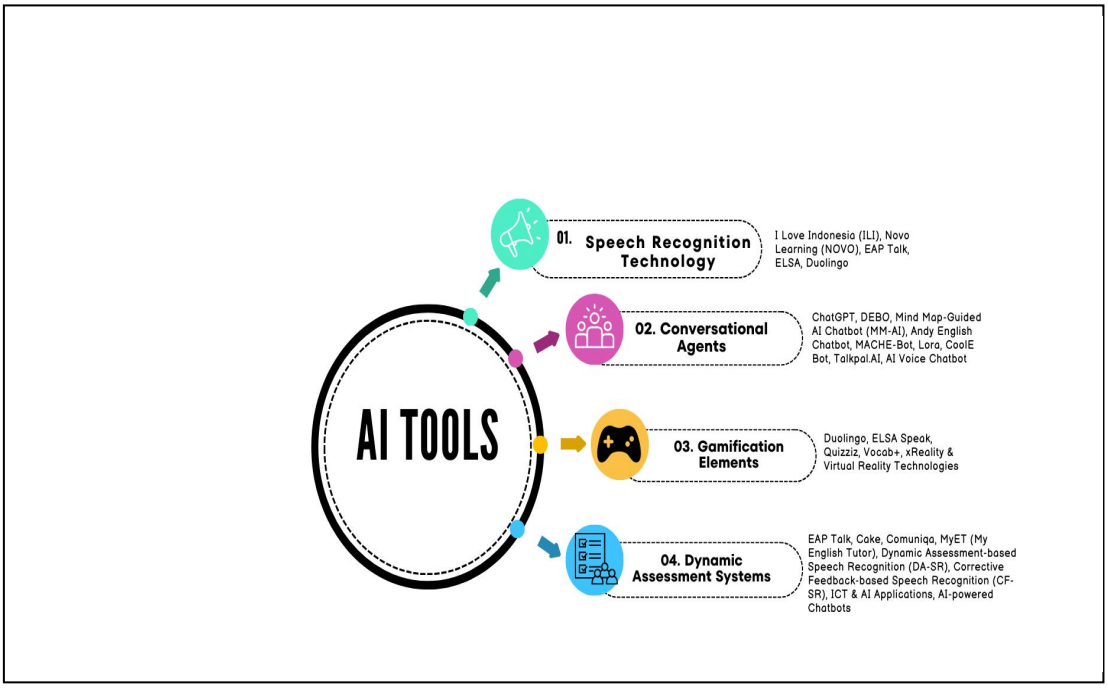


Table 2.

Categories and Descriptions of AI Tools for Enhancing EFL Speaking Skills

AI Tool	Category	Description	Key Studies
I Love Indonesia (ILI)	**Speech Recognition Technology**	Automatic Speech Recognition (ASR)-based website designed to enhance English language learning. It focuses on vocabulary acquisition and speaking skills. The platform has interactive features such as i-watch, where students view videos related to learning topics, and i-hear, where they listen to audio versions of narratives. It includes i-pronounce and i-speak to practice pronunciation and receive feedback.	**(Bashori et al., 2021)**
Novo Learning (NOVO)	**Speech Recognition Technology**	ASR-based website aimed at improving English vocabulary and speaking skills. Similar to ILI, it has interactive features like i-watch, i-hear, i-pronounce, and i-speak, all structured around a learning topic. NOVO differentiates itself by providing specific phonetic feedback.	
EAP Talk	**Speech Recognition Technology**	English for Academic Purposes (EAP) platform for speaking skills improvement. It targets key speaking components, including fluency, pronunciation, rhythm, grammar, and vocabulary. It is Built on advanced technologies such as automatic voice recognition, statistical computing, big data, deep learning, natural language processing, and an automatic speech evaluation system.	**(Zou et al., 2024) (Huang & Zou, 2024)**
Elsa Speak	**Speech Recognition Technology**	English Language Speech Assistant mobile application which is concerned with pronunciation, phonetic accuracy, , vocabulary, and grammar to improve speaking skills.	**(Putri, 2024) (Warman et al., 2023) (Makhlouf, 2021)**
Duolingo	**Speech Recognition Technology/ Gamification Element**	Interactive AI aplication to learn languages. Globaly used for learning vocabulary and pronunciation as well as to improve learners' speaking and listening.	**(Warman et al., 2023) (Madhavi et al., 2023) (Qiao & Zhao, 2023)**
ELSA Speak, Duolingo, and Orai.	**Speech Recognition Technology**	**Orai:** AI-powered application designed to improve public speaking skills. It targets pronunciation, pacing, filler words, and speech clarity.	**(Warman et al., 2023) (Azzahra et al., 2024)**
ChatGPT	**Speech Recognition Technology/ Conversational Agents**	OpenAI that offers human-like conversations oral or in texts in all domains in real-time. It answers questions in engaging conversations whether to provide all information asked for or used for practicing writing and speaking skills.	**(Al-Khresheh, 2024) (Karataş et al., 2024) (Sayed et al., 2024) (Yeh, 2024)**
English Liulishuo, IELTS Liulishuo, EAP Talk, and Yidian English	**Speech Recognition Technology**	AI applications developed for Chinese EFL learners. They all share a common denominator that they provide evaluations of reading aloud and presentation skills by assessing pronunciation, fluency, grammatical accuracy, and vocabulary range.	**(Zou et al., 2023b)**
Lyra Virtual Assistant	**Speech Recognition Technology /**	AI-powered application designed to assist users with various tasks through voice interaction. It has cost-free	**(Junaidi et al., 2020)**

(LVA)	**Conversational Agent**	access and the ability to provide pronunciation feedback ranking as one of the best virtual assistants in 2018.	
Speechling	**Speech Recognition Technology**	AI platform designed to enhance foreign language skills, particularly focusing on pronunciation and speaking abilities.	**(Dennis, 2024)**
Object Detection Translation (ODT)	**Speech Recognition Technology**	AI-based application based on object detection technology and developed using MobileNet and TensorFlow. It is designed to help EFL students learn vocabulary through images, words, and pronunciation.	**(Liu & Chen, 2023)**
AI Speech Evaluation Programs (• Liulishuo • IELTS Liulishuo • EAP Talk • Shanbay)	**Speech Recognition Technology**	**Liulishuo:** An AI-powered app for English learning, more concerned with speaking accuracy. It uses deep learning algorithms and speech recognition systems to assist learners perfect their pronunciation. **Shanbay:** A language-learning app that includes AI-driven pronunciation assessment and vocabulary-building features. It offers speech evaluation tools to help users refine their spoken English skills.	**(Zou et al., 2023a)**
DEBO	**Conversational Agents**	AI-driven educational application directed at practising argumentation. It is associated with ChatGPT to support speaking skills in groups, primarily in debate and public speaking.	**(Lee, et al., 2024)**
Chatbot developed using Dialogflow	**Conversational Agent**	A chatbot builder provided by Google. designed to conduct structured, repeated conversations with the students, focusing on the target dialogues presented in the course videos. The chatbot was integrated with the Google Assistant interface and used speech-to-text and text-to-speech technologies, allowing students to interact with the system using spoken language.	**(Jeon & Lee, 2024)**
Andy English Chatbot	**Conversational Agents**	AI voice chatbot designed for interactive speaking practice. It targets vocabulary, pronunciation, and conversational fluency. English Speaking Bot is an AI chatbot designed to facilitate English speaking practice for EFL learners.	**(Fathi et al., 2024) (Duong & Suppasetseree, 2024)**
Mind Map-Guided AI Chatbot (MM-AI)	**Conversational Agents**	An interactive language learning tool that helps EFL learners improve their speaking skills through personalised, real-time conversations, mood-adaptive responses, and guided mind mapping for structured speech organisation. It incorporates gamification, skill development, and data tracking to enhance engagement, fluency, vocabulary, and pronunciation in a flexible, self-directed learning environment.	**(Lin & Mubarok, 2021)**
MACHE-Bot	**Conversational Agents**	Multidimensional Approach Culture, Humor, and Empathy Bot. AI-based chatbot with natural language processing (NLP) to engage learners in conversations. It attempts improve the speaking skills while incorporating humor and empathy in interactions.	**(Zhai et al., 2024)**
Lora	**Conversational Agents**	AI speaking assistant designed to promote foreign language learning by improving learners' willingness to communicate. It uses interactive dialogues to promote enjoyment of the language.	**(Zhang et al., 2024)**
CoolE Bot	**Conversational Agents**	AI chatbot used in language learning. It centers on enhancing speaking skills through engaging conversations. It aims to reduce speaking anxiety and build confidence in speaking.	**(Tai & Chen, 2024)**

Talkpal.AI	**Conversational Agents**	Conversational AI tool created to support learners speaking practice, pronunciation and fluency. It provides interactive dialogues where users engage in realistic conversations.	**(Hidayatullah, 2024)**
AI-driven Chatbots	**Conversational Agent**	TalkAI – An AI-driven software that allows users to interact with the ChatGPT model via voice. SpeakG – An AI-powered software enabling users to interact through spoken English. Wenxin Yiyan – A text-based chatbot that can be used through its app and website. Xunfei Xinghuo – Another text-based chatbot designed to assist users in practicing and improving their writing.	**(Wang & Xue, 2024)**
Quizziz	**Gamification Elements**	Quizizz is an interactive, game-based learning platform designed to engage students in educational activities, often used for quizzes, assessments, and collaborative learning tasks. It incorporates AI in some features. It is related to vocabulary acquisition, including interactive speaking and listening activities.	**(Kazu & Kuvvetli, 2023)**
Vocab+	**Gamification Elements**	A mobile application that integrates AI to assist learning vocabulary through a gamification. It provides practice exercises and speaking activities.	**(Yang et al., 2024a)**
Cake App	**Dynamic Assessment Systems**	AI-enhanced language learning application. It targets learners' speaking abilities, especially pronunciation and conversational skills through interactive tasks.	**(Octavianita et al., 2022)**
Comuniqa	**Dynamic Assessment Systems**	A novel LLM-based system designed to enhance English speaking skills. AI tool to assess and correct speaking skills in real-time. It targets pronunciation and fluency to help learners improve their spoken English.	**(Sharma et al., 2024)**
MyET (My English Tutor)	**Dynamic Assessment Systems**	AI-powered language learning platform and app focused on Computer-Assisted Pronunciation Training (CAPT). It provides learners with personalised feedback on their speaking skills, particularly pronunciation.	**(Almasifar & Heidari, 2023)**
DA-SR (Dynamic Assessment-based Speech Recognition) **CF-SR (Corrective Feedback-based Speech Recognition)**	**Dynamic Assessment Systems**	AI system that combines dynamic assessment techniques with speech recognition technology to provide personalised, real-time feedback to learners. It also provides targeted evaluation. AI speech recognition with corrective feedback. It provides suggestions for improvement in speaking skills. focuses on providing immediate corrective responses to students' spoken language	**(Chen et al., 2022)**

4.2. Effectiveness of AI Tools for Speaking Skills

Following the endeavour of identifying and categorising AI tools in the selected papers, this section examines their reported effectiveness in improving learners' speaking skills. Compelling evidence has been gathered from the literature as to whether these tools are, in effect, efficacious to enhance the diverse speaking skills, speaking performance, linguistic competence, and oral fluency. Assessing the results comprehensively, AI's distinctive features such as offering interactive language practice and personalised feedback boost learners' engagement and progressive development in enhancing the speaking skills.

4.2.1. Improvement in overall speaking performance

Reading through the selected records, a large number of research papers reported a noticeable positive impact of various AI tools on EFL learners' fluency, pronunciation, and overall confidence (Chen et al., 2022; Huang & Zou, 2024; Jeon & Lee, 2024; Junaidi et al., 2020; Madhavi et al., 2023; Warman et al., 2023; Zhi & Wang, 2024). The AI platforms ILI and NOVO have been investigated in a research by Bashori et al. (2021). They were used to support the speaking skill instruction for Indonesian EFL classes. The study concluded that both platforms contributed significantly to students improved vocabulary, reduced speaking anxiety and overall speaking proficiency. On a similar line of study, Kim and Su (2024) reported that AI chatbots are useful AI for minimising learner speaking anxiety in a foreign language like English which motivated Korean students to engage in more communication tasks, improving their confidence to speak in English and their EFL speaking level by consequence. AI Speaking Assistants seem to achieve comparable results on EFL speaking skills. In a study by Zhang et al. (2024) conducted on EFL Chinese learners, benefits gained by AI Speaking Assistants like Lora; naming elevating enjoyment in learning the foreign language, willingness to communicate, and decreased anxiety levels, are stressed. AI Speaking Assistants, therefore, are proven to be quintessential in supporting speaking environment in foreign language learning, say English.

The presumable consensus on the effectiveness of AI tools on EFL learners' speaking skills is attributed to the immersive and adaptive nature of these technologies which profer ample practice opportunities and constant exposure to the target language. In a higher education context, Talkpal.AI presented observable progress in language clarity and performance of EFL learners in experimental groups in comparison with learners in the control groups (Hidayatullah, 2024). Comuniqa AI system was also tested for its effectiveness in enhancing learners speaking skills, primarily the oral fluency and performance. Although its effectiveness was significant, the Comuniqa fell short in delivering a rather emotionally intelligent feedback to supplement the learning experience (Sharma et al., 2024). Research on DEBO revealed concurring results concerning AI effectiveness, yet problems were reported. The BEBO AI debate application has a binary functionality. While providing language communicative tasks, it bolsters learners thinking skills in the process. The App showed measurable effects on enhancing oral performance, lowering speaking anxiety, and facilitating communication, in spite of marginal shortcomings in response time (Lee, et al., 2024). Putri (2024) documented consistent advantages regarding another application, ELSA speak app. Learners demonstrated, at frequent intervals, evident development in oral performance and pronunciation post ELSA App engagement.

4.2.2. Oral fluency development

It is noticed throughout the literature that language speaking skill improves as a result of lower anxiety and improvement in fluency by the introduction of AI-driven platforms (Azzahra et al., 2024; Hidayatullah, 2024; Jeon et al., 2023). Fathi et al. (2024) observed that educators, recounting their experiences from the focus groups, emphasised that fluency improved notably through engaging interactions and the prompt feedback provided by AI tools. A study by Zhi and Wang (2024) emphasised the important link between improved learner fluency and a robust student-learner relationship facilitated by AI. They stressed the importance of AI in improving collaborative education and increasing motivation for language learning, especially in improving speaking fluency. Similarly, the results of Sayed et al. (2024) suggested that AI-powered tools, particularly ChatGPT, have both short-term and long-term positive effects on EFL learners. AI tools, they confirmed, foster motivation, reduce anxiety, and enhance oral fluency through personalised feedback and self-directed learning.

Huang and Zou (2024) assessed Chinese EFL students using EAP Talk platform and reported greater fluency and accuracy of speech along with greater joy and willingness to communicate in the experiment group (also Zou et al. (2023a) and Zou et al. (2023b) reported similar results on EAP Talk and other AI speaking Apps). Similarly, Octavianita et al. (2022) demonstrated that structured, collaborative practice on the Cake app made learners fluent, adding to the effectiveness of AI applications in the classroom. Interactivity in fluency learning within the speaking skill is also highlighted in Van Den Berghe et al. (2019), in which GenAI was associated with better reading comprehension and speech performance. Taking similar results, Tai and Chen (2024) showed that repetitive chatbot practice promoted speaking confidence and fluency in students; Hwang et al. (2022) also explained that, in speaking practice, AI diminished anxiety and helped establish a conducive environment, both supporting factors for fluency. Speaking of AI chatbots, Duong and Suppasetseree (2024) study on AI Voice Chatbot examined the impact of an AI voice chatbot on Vietnamese undergraduate students' speaking skills. They concluded that the chatbot allowed students to practice English interactively, and to significantly improve their oral fluency, accuracy, grammar structures, and vocabulary.

4.2.3. Linguistic competence enhancement

The linguistic competence as part of the speaking skill encompasses further sub-skills as vocabulary and pronunciation accuracy and grammatical precision. These language areas has been shown to have enhanced thanks to the integration of AI in speaking sessions. In a precise sense, a range of papers such as Liu and Chen (2023), Yang et al. (2024a), Almasifar and Heidari (2023), and Hwang et al. (2024) made evident the effectiveness of AI in improving particularly these linguistic skills fundamental to enhancing speaking proficiency. Zou et al. (2024) examined the influence of the AI-based speech evaluation system EAP Talk on the aforementioned speaking sub-skills. Considerable enhancements were gained in that matter especially in better ideas organisation, sound use of grammar and improved pronunciation as well as vocabulary selection. Nevertheless, the AI tool was not exempt from limitations. Limitations were noted concerning feedback clarity to learners of beginner levels, necessitating further support and training on how to use the app to ensure maximum benefits while speaking skills can be improved. In a comparable study, Tai and Chen (2024) stated that individual and group use of CoolE Bot both demonstrated significant improvement of elementary EFL learners' speaking skills, chiefly vocabulary retention and confidence to speak in English.

AI-driven chatbots are also tools demonstrated as effective in improving the speaking skills of EFL learners since they advance their engagement with the target language. Wang and Xue (2024) stressed the importance of these chatbots for enhancing grammar and vocabulary as demonstrated in students' speaking outcomes. Wang and Xue (2024) further asserted that AI-driven chatbots being adaptive and interactive contribute largely to sustain consistent improvement of the speaking skill. Imran et al., (2023) research results validate the previous findings by Wang and Xue (2024). Lecturers observed a measurable improvement in the speaking skill majorly attributed to the contextual feedback AI provided. Thus, learners' linguistic accuracy improved with the aid of AI which also rendered the teaching task of the speaking skill less laborious to educators on account of the ability of AI to deliver personalised feedback adaptive to each student's weaknesses. Likewise, Makhlouf (2021) suggested pronunciation-focused AI applications as a solution to students in need of structured feedback in phonetic areas. Lin and Mubarok (2021), on the other hand, conducted a case study on chatbot tutors (Mind Map-Guided AI Chatbot (MM-AI) and Conventional AI Chatbot (C-AI) in a university flipped English speaking classroom. Findings revealed significant enhancement in vocabulary and pronunciation as a result of ongoing interactive

tasks the chatbot tutors provided. Rusmiyanto et al. (2023) observed, in their systematic literature review, that constant exposure to authentic language input with correct, varied grammatical and vocabulary structures, as well as pronunciation patterns, has tremendous positive effects on enhancing learners' linguistic competence, which subsequently develops EFL learners' speaking proficiency.

4.2.4. Personalised learning experiences

Numerous studies indicate that AI tools are growing more and more supportive of adaptive learning which is adjusted according to the proficiency level of the learner (Dennis, 2024; Kim & Su, 2024; Qiao & Zhao, 2023). The adaptive nature of AI forms the foundation of a more meaningful and effective spoken language practice. Zhai and Wibowo (2023) conducted a systematic literature review on AI and found that different levels of speaking proficiency can be effectively achieved, promoting meaningful interactions and engagement through AI platforms and applications. The study outlined in Al-Khresheh (2024) highlighted that ChaGPT is widely acknowledged as a facilitator of interaction and engagement, despite the concerns regarding an increasing reliance on it by students hoping for speaking skills, and other skills, improvement. Jeon et al. (2023) introduced a model for chatbots that goes beyond ChatGPT, integrating goal-oriented feedback to address the varied needs of learners. The results indicated a significant improvement in the speaking skills of learners. The research discussion in Zhai et al. (2024) work focused on the importance of offering not only personalised learning experiences but also culturally engaging tasks reinforced by humor and empathy, features both found in the AI tool investigated MACHE-Bot.

Generative AI for improving the speaking skills for EFL learners has been commonly investigated whether in systematic literature reviews or in experimental studies. Waluyo and Kusumastuti (2024) noted that Generative AI is effective in improving different speaking sub-skills. It also assists learners with dissimilar proficiency levels be engaged with language input on their own advocating student autonomy. Speaking of autonomy, applications like Duolingo and ELSA Speak are known for vocabulary practice; however, Azzahra et al. (2024) discussed their effectiveness in raising learner autonomy through the feedback, engagement and progress tracking which helps educators monitor every learner's progress from afar; so is Quizzez as Kazu and Kuvvetli (2023) reported to have improved student motivation and engagement. The literature reviews noted the potential of Generative AI in creating rich, personalised learning environments and the psychological benefits of AI personalisation, boosting students' confidence in speaking in English (Law, 2024; Wang, 2023). Following these results, Karataş et al. (2024) along with Yeh (2024) demonstrated the effectiveness of AI applications to enhance the listening and speaking skills through the interactive and engaging features of AI along with tailored feedback provision.

5. Discussion

The inquiry centered on AI tools employed for the enhancement of EFL learners speaking skills to compliment LMOOCs is a timely and critical endeavour. Needless to say, educational practices have been evolving along technological advances; therefore, comprehending the association between AI tools and pedagogy has become pivotal. The current discussion delves into analysing and synthesising the findings gathered from the systematic literature review and presented earlier, elaborating on the effectiveness of AI in addressing EFL learners/ teachers obstacles whenever the speaking skills are concerned. In turn, the discussion paves the way into considerations of AI integration within LMOOCs to improve teaching and learning the speaking skills.

The analysis of multiple records in the systematic literature review reveals the availability of a plethora of AI tools being used within the EFL context to help improve

learners speaking skills, each serving a particular purpose. The existance of such a wide range of AI tools reinforces theories supporting personalised language learning. While speech recognition tools are widely used for pronunciation and fluency enhancement purposes, conversational AI tools support the formerly mentioned purposes through practicing speaking in a rather interactional manner. AI dynamic assessment tools, on the other hand, further supports personalised language learning via its features sustaining real-time individualised feedback to cater for the needs of each learner separately. Engagement and motivation are also promoted using AI gamification tools. Viewed in its entirety, AI technology is of substantial effect on the improvement of EFL learners speaking skills outcomes.

The varied nature of AI tools indicates that AI technology can be integrated within EFL classes to improve the different aspects of the speaking skill; linguistic competence, interaction skills, oral fluency, and production. Immediate feedback is stressed in almost all, if not all, papers as indispensible for enhancing the speaking skills as well as the confidence to speak in English. Tools such as ELSA Speak and Duolingo are prevalently investigated for they support real-time tailored feedback. The fact that a plethora of AI tools for the speaking skills is rendered accessible demonstrates that traditional classroom settings and other online settings like LMOOCs can be complimented by more flexible language practice alternatives. In this regard, AI does not only play the all important role of facilitating the endeavour of EFL learning and teaching; in the meantime, it is advancing a completely novel paradigm in EFL language teaching and learning.

The findings in this research substantiate the profound impact of AI tools on the speaking skill enhancement, majorly their functionality to offer adaptive language practice that meets EFL learners current proficiency and needs. These results are consistent with those of Alshumaimeri and Alshememry (2023), who advocated for the employment of AI technology to enhance all four linguistic abilities, particularly oral communication and the overall speaking skill. Chen et al. (2020) explained the agreement that AI technologies may help EFL students improve their speaking abilities by providing several interactive settings where students can focus on creating their own unique language learning experiences.

Results further reveal a consistent accentuation on the pivotal role immediate feedback plays in improving the speaking skill, which is a pevailing feature in AI tools namely chatbots and AI virtual tutors. The results align with Yang's (2020) research, which affirmed the relevance of immediate feedback to the improvement of learners fluency as part of the speaking skills. The literature study presents a unified conclusion around AI real-time feedback that helps learners get timely and relevant information. This shows how AI may help with problems like giving massive courses enough feedback to make sure students are well-supported as they work to improve their speaking abilities.

The findings, also, reveal that AI stands out in language learning not only for its real-time feedback provision but also for its personalised approach in delivering it. Differing learners' needs, learning styles, and learning pace can all be attended to timely with the support of AI tools which offer individualised guidance. These findings indicate that these functions of instantly assessing learners' performances to select improvement areas and adjust instruction and feedback for thousands of learners- functions non-existent in human instruction- are the very solutions needed to improve the speaking skills, engagement and interaction. This agrees with findings of Pokrivcakova (2019), who stated similar challenges faced by EFL teachers, including consistent, real-time, precise feedback provision to large numbers of learners in EFL speaking classes. Both results converge on advocating AI tools to improve the speaking skills.

Shazly (2021), building on this premise, deduced that AI, with its immersive technology, encourages genuine language acquisition. These results are consistent with recent studies emphasising the significance of prompt and personalised guidance for improving EFL students' oral communication abilities. Acting as a student companion, AI continuously supports learners in mastering the speaking skills with human-AI interactions, practice, and feedback. These findings, once again, show the effectiveness of AI, including its varied technologies, in assisting EFL learners improve their speaking profieciency comfortably with confidence eliminating hindering factors such as hesitation, discomfort, lack of feedback and the like.

Another feature that was found in the literature research is collaborative learning. The literature reveals that AI technologies, in the form of online environments, facilitate student-teacher cooperation in language speaking sessions. The results are congruent with what Yang (2020) has proposed. He acknowledged the vital role AI can play in fostering collaborative learning and fruitful interactions online. The results suggest the practice of the speaking skill can be further supported via AI tools where collaboration is permitted like DEBO. Henceforth, AI collaborative environments can be suitable solutions to problems of socialisation encoutered in LMOOCs, addressed in the research conducted by Hsu (2021).

6. Pedagogical Implications of Effective AI Tools within LMOOCs

The integration of AI tools within LMOOCs presumably answers issues surrounding the current LMOOC structure. Delivering personalised feedback coupled with fostering ongoing learner engagement engender commanding hindrances to mastering the speaking skill on large-scale platforms, namely EFL MOOCs. Given that EFL instructors expressed their concerns surrounding teaching and assessing the speaking skills on LMOOCs, it is interesting to observe the evolution of AI employment for similar purposes off-LMOOCs in some quarters of academia positioning this research as a new paradigm that stands for the junction of teaching the speaking skill on LMOOCS and incorporating AI within the teaching practices, and, so, this particular study intends to foretell the course of action in so doing. Taken as a whole, the findings propose practical implications of AI tools for language designers, educators, researchers and learners within the purview of LMOOCs.

One salient impediment in LMOOCs is the burden of adequate feedback provision in large classes which itself is at the essence of creating an engaging learning atmosphere online. To mitigate this issue, AI-mediated platforms like speech recognition technologies (e.g., ELSA, Babbel) and conversational agents (e.g., ChatGPT, Talkpal.AI) are conductive to the practice of speaking, pronunciation and fluency involved. These AI tools, for reminder purposes, offer adaptive feedback to its language users in real-time. Hence, EFL learners seeking improving language skills via LMOOCs can be offered chances to refine their pronunciation devoid of the need for instructors personalised guidance and mentorship. Not only will learners be supported in surmounting pronunciation obstacles as part and parcel of improving their speaking skill but also it empowers them to engage in off-class language practice unburdening the loads of the next to impossible attempt to provide feedback to every individual on the massive platform, thereby addressing these particular limitations of LMOOCs.

AI-powered gamification elements, such as those found in Duolingo, propose stimulating and communicative speaking tasks which have been proven effective in developing vocabulary and fluency as far as EFL students are concerned. Will these tools be integrated in LMOOCs, learners can by then engage in speaking practices in an environment supportive of low-stress which is likely capable of bettering speaking fluency and confidence. AI-driven gamification tools are, therefore, highly recommended for integration within

LMOOCs to approach the engagement-related challenges given that they contribute to an interactive, rewarding and sustained practice. It is advisable that instructors compliment AI tools with collective remarks regarding strategies and feedback using AI analytics. In this regard, students struggling with given speaking skills- vocabulary retention, fluency, and others- are also to be supported receiving targeted guidance towards particular AI supported tasks.

The adoption of dynamic assessment systems, like those in MyET and CoolE Bot, is pivotal for continuous tracking of learners' speaking progress on LMOOCs. AI-based assessment tools monitor improvements in grammatical accuracy, fluency, and vocabulary use, enabling educators on LMOOCs to identify congruent difficulties in learners' performance and offer group advice to address commonly repeated obstacles. AI assessment tools are exceedingly advantageous for massive online classes since it is impractical to review individual performances. The optimal course of action is to analyse aggregated AI data by LMOOCs instructors so that they can generate global feedback suitable to prevalent educational hurdles to improve the overall performance without the imperative to tailor feedback individually to each learner being AI well-supported.

The findings also capitalise on collaborative learning activities. EFL instructors are further encouraged to guide students on how to leverage AI-powered tools for different collaborative speaking tasks, as AI-driven chatbots offer flexible platforms for interactive speaking tasks, offering learners opportunities to work collaboratively and interact with one another for the shared goal of improving their speaking skills. Making collaboration available on AI applications nurtures the lacking sense of community and support on LMOOCs. Teachers can direct EFL learners on LMOOCs towards utilising applications like DEBO, a platform for structured argumentation, or LORA, an immersive AI role play tool, in authentic language practices of social interaction through realistic scenarios.

7. Conclusion

The growing focus on incorporating AI into educational environments, particularly in the area of language learning, and the requirement to grasp the noticeable impact the latest advanced innovation has on the teaching practices and students' learning to refine twenty-first-century EFL teaching and learning could be the key contributors to the relevance of the current research. By conducting this systematic literature review, one can discover more regarding the available AI tools and recognise the ideal strategy to utilise them to improve students' speaking skills on LMOOCs, filling a patent vacuum in the literature. The paper attempted to identify AI tools proven effective to enhance the speaking skills in previous records to tentatively advocate AI-based strategies for LMOOC speaking-skill-related barriers. Findings suggest that advanced AI-based technologies possess the ability for altering the practices of teachers and learners, overtly or covertly, on LMOOC platforms as far as the speaking skill is concerned. A variety of AI-driven educational approaches, designed to support students in improving the speaking skills more effectively, are worth transferring to the LMOOC structure. Results disclose that a strategic selection of AI tools, like chatbots, Duolingo, voice recognition technologies, and adaptive platforms, opportune to feedback provision and engagement can suggestively address these concerns by advancing interaction and realistic language practice scenarios where real-time feedback is embedded. Apropos actionable implications, the research elucidates ways teachers, course designers, and students could employ, incorporating conversational agents, performance analysis systems, and peer collaboration platforms within LMOOCs to support teaching/learning the speaking skills. As AI is in inevietable evolution, an abundance of tools are yet to pile, offering further technologies to render language learning time and effort effecient, solving more and more of the current issues.

8. Limitations and Further Research Suggestions

This research was prone to stumbling upon a number of limitations, top of which is its focus on a specific set of AI tools proven effective for enhancing EFL speaking skills on LMOOCs; other possibly beneficial tools may have been overlooked. The research would go astray had its primal objective been to present an exhaustive list of all AI tools obtainable. Rather, it suggests usable variants that could support meaningful engagement with AI on LMOOCs in the effort of settling speaking-related issues. More research is needed to explore additional AI tools, in book chapters, editorials, dissertations, etc., that could be effective in enhancing speaking skills to be employed in LMOOCs.

One more limitation concerns the research methodology, specifically the inclusion and exclusion criteria. Decisions were made regarding the exclusion of book chapters, dissertations, serials, and editorials to maintain the precise scope of this research, rendering it achievable within the time boundaries. It is very probable that much information is lost in those valuable records. That being the case, more research is needed to explore the evolving landscape of AI in language learning. Another limitation in the current research is the challenging attempt to assort the identified AI tools in their proper categories. A myriad of AI tools possess the capacity to handle multiple functions simultaneously such as ChatGPT or Duolingo. Future study might provide a more precise categorisation of these instruments, taking into account their multi-functionality, in order to develop a more solid-based classification.

As AI tools advance by the minute, further research on harnessing more sophisticated AI technology to adequately cater for personalised learning needs within and beyond the MOOC framework is called for. Upcoming research might target investigations pertaining to the way learners with ranging language proficiency levels interact with the suggested AI tools in LMOOCs as to whether speaking skills significantly improve by means of AI-driven feedback on LMOOC platforms as opposed to online and hybrid approaches. Future studies should also look into the implementation and impact of AI across multiple speaking sub-skills, vocabulary acquisition, grammar improvement, fluency, and production. Extended research is essential to evaluate the enduring effects of AI tools on students' speaking abilities, examining how these enhancements hold up over time. Research into the effectiveness of certain AI technologies in language education and learning, especially in enhancing oral communication skills, should focus on studying their use in LMOOCs in the future.

It is noteworthy that this review foregrounds the effectiveness of a number of AI tools to enhance the speaking skills of EFL learners which might as well be transferrable to LMOOC context in an attempt to solve issues related to LMOOCs. Surprisingly, very few studies have explored in detail demerits of these AI tools in EFL context. Very few studies exploring pedagogical implications of AI in the EFL context to enhance the speaking skills gave attention to technical problems, unavailability issues, and ethical implications and risks when applying AI. Therefore, this research calls for further studies exploring those areas.

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