The Implementation of AI Technology-Based Immersion in Designing English Speaking Skill

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Abstract
Despite the increasing integration of Artificial Intelligence in language learning, limited research has explored how AI-supported immersion can be practically implemented to develop English speaking skills in EFL contexts, particularly in Indonesian higher education. The purpose of this study is to understand the implementation of AI technology-based immersion in designing English speaking skill. This research aims to identify the strategies used in integrating artificial intelligence tools to enhance students' English-speaking abilities. The study was conducted in an international class of the English Education Department at one of state university at Semarang, Indonesia, where English is used as the medium of immersion. The class consists of 25 students and 2 lectures, including several international students from English-speaking countries. This research employs a qualitative method. The findings indicate that the implementation of AI-driven learning tools such as AI chatbots, speech recognition systems, and real-time feedback applications significantly supports students' and lectures' engagement and speaking fluency. AI technology creates an interactive and adaptive learning environment, allowing students to practice English communication more confidently and independently. Moreover, while AI tools were effective in supporting international communication standards, certain challenges emerged among local students who required occasional clarification in Indonesian, indicating a transitional adaptation process to full English-based AI immersion.

1. Introduction

In recent developments, the integration of Artificial Intelligence (AI) technology into immersion programs marks a significant innovation. AI-powered tools such as speech recognition software, intelligent virtual tutors, real-time feedback systems and adaptive learning platforms are now being utilized to enhance students' speaking skills and provide a more interactive learning environment. These tools simulate real-life communication scenarios and provide individualized feedback, allowing learners to engage in meaningful, immersive experiences even outside the traditional classroom setting (Yen et al., 2015; Li, 2020; Huang et al., 2022). Furthermore, AI technologies facilitate personalized learning paths, enabling students to advance at their own pace while maintaining high levels of interaction and language exposure.

In AI-based immersion classrooms, digital platforms act as both instructional media and interaction spaces. Students collaborate with AI systems and human instructors in a flexible learning ecosystem that encourages risk-taking in speaking and builds communicative confidence (Warschauer & Healey, 1998, Kessler, 2018). The incorporation of AI does not replace human interaction but rather augments it, making learning more engaging, efficient, and data-informed (Luckin et al., 2016; Godwin-Jones, 2018). In summary, AI technology-based immersion represents a transformative approach in language education, particularly in enhancing English speaking skills. By blending immersive pedagogies with advanced technology, this model addresses both linguistic and cognitive development while responding to the demands of global communication and 21st-century education.

In this context, AI technology-based immersion emerges as an innovative solution to overcome these obstacles. By integrating Artificial Intelligence tools such as speech recognition, adaptive learning algorithms, real-time feedback systems and intelligent virtual interlocutors immersion programs can be reimagined to better support English-speaking skill development. These tools simulate authentic interactions, provide personalized learning experiences, and reduce language anxiety by offering low-risk speaking environments (Shahini & Shahamirian, 2017; Butarbutar, 2024).

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AI-enhanced immersion classrooms also promote dynamic, student-centered learning where English becomes both a content medium and a tool for social engagement. The immersive environment shifts the classroom away from traditional teacher-centered instruction toward interactive, collaborative practices that foster fluency and confidence. AI systems can analyze student speech patterns, identify fluency gaps, and recommend targeted interventions, allowing for more efficient and responsive pedagogy.

Furthermore, this AI-based model addresses the psychological dimensions of language learning by creating supportive environments that reduce fear and self-consciousness. Learners are gradually exposed to cultural nuances and communicative strategies, leading to a deeper understanding of both language and identity. As Indonesia navigates the challenges of implementing immersion education within a centralized curriculum, the use of AI can provide flexible, scalable, and contextually relevant solutions without the need for complete policy overhauls. Recent studies also highlight that AI-supported language learning environments can enhance learner engagement, motivation, and interaction in foreign language contexts (Huang et al., 2022; Godwin-Jones, 2018).

Although immersion pedagogy and artificial intelligence have been widely discussed in language education, most previous studies examine them separately, Research focusing on the practical integration of AI tools within an immersion-based classroom, particularly for improving English speaking skills in EFL contexts such as Indonesia, remains limited. Moreover, little empirical evidence explains how AI-supported immersion influences classroom interaction, lecturer roles, and student engagement in higher education settings.

Therefore, this study aims to explore the implementation of AI technology-based immersion in designing English-speaking instruction in an Indonesia university context. Specifically, this research investigates how AI tools support immersion practice, how lecturers and students interact within this environment, and how such integration contributes to the development of students' speaking competence.

2. Method

2.1. Research Approach and Design

This study employed a qualitative approach using a case study design to integrate the implementation of AI technology-based immersion in teaching English speaking skills. A case study was considered appropriate because it allows researchers to explore complex educational phenomena within their real-life contexts (Starman, 2013; Crowe et al., 2011). The research focused on understanding classroom interactions, instructional strategies, and students' experiences within an immersion-based learning environment supported by AI technologies.

2.2. Research Participants

The participants of this study were 25 students and two lecturers from an international class in the English department at one of the state universities in Semarang, Indonesia, where English was used as the medium of instruction. The class consisted of fourth-year students, including both domestic and international students.

2.3. Instruments and Data Collection Procedure

Data were collected using multiple instruments to capture the multidimensional nature of AI-based immersion. First, the researcher functioned as a primary instrument, conducting participant observations to record real-time interactions between lecturers and students during immersion-based speaking activities. Second, a questionnaire was distributed to gather students' perceptions and experiences regarding immersion practices in the classroom (Cargan, 2007). Third, a semi-structured interview protocol was employed to obtain deeper insights from both students and lecturers, allowing for flexibility while focusing on predefined themes (Edwards, 2013). Fourth, all interviews were supported by a tape recorder to ensure accurate transcription of spoken data, consistent with Thompson (1996). Finally, field notes were compiled during observations to document classroom dynamics, behaviors, and spontaneous language use.

2.4. Data Analysis

The data analysis was conducted in two main dimensions: (1) the implementation of immersion, and (2) the interaction between lecturers and students. Regarding implementation, the researcher investigated how students developed their speaking skills through the use of English as the instructional language. Attention was given to linguistic development, psychological responses, and cultural adaptation within the immersive environment. AI tools were analyzed for their role in facilitating real-time correction, fluency development, and language confidence.

In analyzing interaction, the study focused on classroom settings, instructional approaches, material use, and students' responsiveness. The researcher applied grouping strategies as suggested by Krahnke & Christison

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(1983), involving techniques such as dyads, small groups, and whole-class activities, to evaluate how peer interactions and collaborative learning contributed to speaking performance. These strategies helped simulate realistic speaking scenarios and maximized student engagement.

3. Results and Discussion

3.1. Result

This research indicates sufficient differences between lecturers and students when applying for the immersion program. The differences lie in how the researcher implemented the immersion program in the classroom. It can be seen from the following data:

Table 1. Findings

Data Source	Finding	Category	Analysis
Data 1	Two contrasting lecturers performances in the immersion classroom: • LR1 uses energetic, English-only delivery. • LR2 often uses Indonesian, lacks preparation.	Lecturer Readiness & Delivery	The success of immersion depends on the lecturer's commitment and preparedness. AI-based virtual tutors can fill the gap when instructors are not fully immersed or confident, offering consistent exposure to English.
Data 2	Students actively engage in out-of-class immersion activities: • Reading English stories. • Watching native speaker videos. • Practicing in front of mirrors.	Student Initiative & Confidence	The high student motivation shows readiness for tech-supported immersion. AI-powered speech recognition tools and NLP-driven fluency tracking could further personalize and reinforce these self-directed practices.
Data 3	English is used as the main medium of instruction; however, lecturers sometimes revert to Indonesian to explain complex tasks.	Language Consistency in Instruction	This suggests a partial immersion. AI systems can supplement this with real-time translations or scaffolding tools that maintain English immersion while ensuring comprehension.

The implementation of AI Technology-Based Immersion in English-speaking instruction addresses several key pedagogical gaps identified in traditional classroom practices. First, discrepancies in lecturer competence remain a significant barrier; not all educators are equally equipped to deliver immersive instruction consistently. Some lecturers naturally maintain an English-only environment, while others revert to Indonesian when faced with complex topics or learner confusion. This inconsistency disrupts immersion and creates unequal exposure among students. Here, AI-powered virtual tutors and avatars can act as standardizing agents, ensuring uniform linguistic input and interaction regardless of instructor variability.

Meanwhile, the data reveal high levels of student enthusiasm and independent learning behaviors. Many learners extend their engagement beyond the classroom by reading English texts, watching native speaker content, and practicing speech individually. This proactive stance can be amplified through AI tools that offer instant feedback, interactive role-plays, and adaptive speaking tasks, turning passive exposure into active fluency-building exercises. As Warschauer and Healey (1998) suggested, technology enables communicative and contextualized learning. AI systems exemplify this by dynamically responding to each learner's evolving proficiency. Another challenge arises from hybrid language use in the classroom, where lecturers resort to Indonesian to convey essential academic instructions, particularly concerning assessments. This indicates a cognitive gap where immersion is compromised for clarity. AI-assisted bilingual scaffolding which provides translations or simplified explanations in real-time can address this issue without sacrificing the immersive environment, helping students gradually internalize complex academic discourse in English.

Finally, consistent structured input enhances student competence. When lecturers prepare thoroughly and use English throughout the lesson, students demonstrate improved speaking performance. However, maintaining such consistency across instructors is challenging. Here, AI systems serve a critical role in sustaining pedagogical structure by delivering curated, level-appropriate input regardless of instructor style or experience.

In essence, these findings reinforce the transformative potential of AI in immersive English learning: bridging human limitations, reinforcing learner autonomy, and ensuring instructional equity and consistency. This convergence of human facilitation and machine precision paves the way for a more responsive, inclusive, and outcome-driven model of English language education in Indonesia.

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3.2. Discussion

The findings of this study demonstrate that the implementation of immersion-based instruction in English-speaking classes is significantly influenced by the pedagogical readiness and linguistic commitment of lecturers. The contrasting instructional practices observed between Lecturer 1 (LR1) and Lecturer 2 (LR2) highlight how variations in teaching strategies shape the effectiveness of immersion environments. LR1 consistently used English as the primary medium of instruction and incorporated visual learning media such as images and videos to support comprehension. In contrast, LR2 occasionally reverted to Indonesian when explaining complex academic tasks, particularly when delivering instructions related to assignments and final projects.

Although this strategy was intended to ensure clarity, it reduced the level of linguistic immersion experienced by students. These findings support the argument of Hinkel & Fotos (2001) that immersion pedagogy requires consistent use of the target language in both instructional delivery and classroom interaction in order to sustain meaningful communicative exposure. Recent studies on immersion pedagogy also emphasize that teacher language proficiency and instructional strategies play crucial roles in sustaining immersive learning environments and facilitating communicative competence (Cammarata & Tedick, 2017; Lyster, 2017).

However, the results also reveal that maintaining full immersion in EFL contexts such as Indonesia presents practical challenges. Unlike immersion settings in countries where English functions as a dominant or widely used language, Indonesian learners often encounter limited opportunities to practice English outside the classroom. As a result, lecturers may feel compelled to provide explanations in the native language to prevent misunderstandings and ensure that academic instructions are clearly understood.

This tension between linguistic immersion and pedagogical clarity reflects a broader challenge identified in immersion research. As Barimani (2013) noted, effective immersion programs require both linguistic consistency and sufficient instructional scaffolding to support learners who are still developing their communicative competence. Recent research also highlights that supports comprehension without significantly undermining immersion goals (Macaro, 2022; Turnbull & Dailey-O'Cain, 2009).

The findings further indicate that technological support, particularly through artificial intelligence (AI) tools, can play a significant role in addressing these instructional challenges. AI-supported technologies such as speech recognition systems, conversational chatbots, and real-time feedback platforms offer opportunities for students to practice speaking in interactive and low-pressure environments. Unlike traditional classroom settings, where time constraints and classroom dynamics, may limit speaking opportunities, AI tools enable students to engage in repeated speaking practice while receiving immediate feedback on pronunciation, fluency, and language accuracy. This feature is particularly beneficial for learners who may experience anxiety or hesitation when speaking in front of peers. As Warschauer and Healey (1998) emphasized, digital technologies have the capacity to expand communicative opportunities in language learning by providing flexible and individualized interaction spaces that extend beyond the physical classroom.

Another important finding of this study relates to students' proactive engagement in independent immersion activities outside the classroom. Many students reported practicing English through activities such as watching English-language videos, reading online materials, and rehearsing speaking in front of mirrors. These behaviors suggest that learners possess intrinsic motivation to improve their speaking abilities when they are exposed to supportive learning environments. The presence of AI-based learning tools can further amplify this motivation by providing structured opportunities for autonomous learning, through adaptive learning algorithms and personalized feedback systems.

AI technologies allow learners to practice speaking at their own pace while gradually increasing the complexity of communicative tasks. This approach aligns with the perspective of Krahnke and Krashen (1983), who emphasized the importance of meaningful input and learner engagement in facilitating language acquisition. Recent studies on technology-mediated language learning also highlight the role of digital platforms in promoting learner autonomy and self-directed learning behaviors (Kukulska-Hulme, 2020; Lee, 2020).

In addition to supporting learner autonomy, AI technologies can also function as complementary instructional resources for lecturers. The study indicates that differences in lecturer readiness may lead to variations in the quality of immersion-based instruction. While some lecturers demonstrate strong proficiency and confidence in maintaining English as the instructional language, others may struggle to sustain full immersion due to linguistic limitations or instructional constraints.

In such cases, AI-based systems can help standardize language exposure by providing consistent linguistic input and interactive speaking activities. For example, AI-powered virtual tutors or conversation simulators can guide students through structured speaking exercises even when classroom instruction varies in intensity. This technological support does not replace the role of lecturers but instead enhances the overall learning ecosystem by ensuring that students receive continuous opportunities for language practice. Research on artificial

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intelligence in education suggests that AI tools can effectively complement human instruction by providing adaptive learning support and personalized feedback mechanisms (Holmes & Tuomi, 2022).

Furthermore, the integration of AI technologies within immersion-based instruction contributes to addressing the psychological barriers often associated with speaking in a foreign language. Previous research has shown that language anxiety, fear of making mistakes, and lack of confidence frequently hinder students' willingness to participate in speaking activities (Shahini & Shahamirian, 2017).

AI-supported learning environments can mitigate these barriers by providing non-judgmental interaction spaces where learners can experiment with language use without the pressure of peer evaluation. Through repeated interaction with AI systems, students gradually develop greater confidence in expressing their ideas in English, which ultimately strengthens their communicative competence. Recent studies also suggest that AI-driven conversational agents can reduce speaking anxiety and increase students' willingness to communicate in second language contexts (Fryer & Carpenter, 2020).

Importantly, this study contributes to addressing a notable research gap in the literature on language education. Although immersion pedagogy has been widely recognized as an effective approach for second language acquisition, most studies have focused primarily on traditional immersion models implemented in bilingual or multilingual societies. Similarly, research on AI-assisted language learning has largely examined the use of technological tools in isolated language learning activities rather than within comprehensive immersion frameworks. Consequently, limited research has explored how AI technologies can be systematically integrated into immersion-based instruction to support the development of speaking skills in EFL contexts such as Indonesia. By examining the interaction between immersion pedagogy and AI-supported learning environments, this study provides empirical insights into how technological innovations can enhance the effectiveness of immersion programs in higher education settings.

Moreover, the findings suggest that AI Technology-Based Immersion represents a promising pedagogical innovation that aligns with the evolving demands of 21st-century language education. In contemporary educational contexts characterized by rapid technological advancement and increasing global communication, language learning environments must adapt to incorporate digital tools that facilitate interactive and personalized learning experiences. AI-supported immersion models allow educators to combine the strengths of human instruction with the efficiency and adaptability of intelligent technologies. This hybrid approach enables learners to experience authentic language use, receive immediate feedback, and engage in collaborative communication practices that mirror real-world interactions.

Overall, the discussion highlights that the successful implementation of AI technology-based immersion requires a balanced integration of pedagogical strategies, technological resources, and institutional support. Lecturers remain central figures in facilitating meaningful interaction and guiding students through complex communicative tasks. At the same time, AI technologies provide valuable support by expanding speaking opportunities, enhancing learner autonomy, and ensuring consistent linguistic exposure. Through this synergy between human instruction and technological innovation, AI-supported immersion has the potential to significantly improve English-speaking instruction in EFL contexts and contribute to the development of more effective and inclusive language learning environments.

3.3. Implications

The findings of this study highlight the importance of integrating artificial intelligence tools within immersion-based language learning environments. AI technologies such as speech recognition systems, virtual tutors, and real-time feedback platforms can support lecturers in maintaining consistent English exposure while providing students with opportunities for autonomous speaking practice. The results also suggest that AI-supported immersion can enhance student confidence and engagement in speaking activities. Therefore, higher education institutions should consider incorporating AI-assisted language learning platforms into English-speaking courses and provide professional development for lecturers to integrate these technologies into classroom instruction effectively.

3.4. Limitations

This study has several limitations. First, the research was conducted in a single international class at one Indonesian university, which may limit the generalizability of the findings to other educational contexts. Second, the study employed a qualitative design focusing on classroom observations and participant perceptions; therefore, it did not measure the quantitative improvement of students' speaking proficiency. Future research could involve multiple institutions and apply mixed-method approaches to examine the long-term effectiveness of AI- supported immersion in improving English speaking skills.

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4. Conclusion

The implementation of AI Technology-Based Immersion in designing English speaking skills reveals differing instructional approaches among lecturers, which significantly influence students' engagement and comprehension. Lecturer 1 (LR1) demonstrated effective immersion practices by integrating dynamic communication strategies, including the use of visual aids such as pictures and videos, to facilitate students' understanding of lesson topics. LR1's commitment to delivering special instructions entirely in English further encouraged students to participate actively in EFL classes, supporting the development of communicative competence within an immersive framework. In contrast, Lecturer 2 (LR2) showed limitations in maintaining full immersion, particularly when conveying complex information regarding the final project. Due to perceived difficulties among some Indonesian students in understanding these instructions, LR2 reverted to using Indonesian. This shift, while intended to clarify meaning, disrupted the immersive environment and highlighted a gap in consistent English exposure.

Author Contributions

Farida contributed to the conceptualization of the study, data collection, and preparation of the original manuscript draft. Supardi was responsible for methodology development, data analysis, and validation of the research findings. Andi Adisaturrahimi contributed to supervision, project administration, and critical review and editing of the manuscript. All authors discussed the results, contributed to the interpretation of the findings, and approved the final version of the manuscript.

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Declaration of Conflicting Interests

The authors declare that there are no conflicts of interest regarding the publication of this article. The research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request. The datasets include interview transcripts, observation notes, and supporting documents collected during the study. All data have been anonymized to protect participants' confidentiality.

Declaration on AI Use

The authors declare that artificial intelligence (AI) or AI-assisted tools were used only for language editing and readability improvement under human supervision. AI tools were not used to generate the research design, data analysis, interpretation of results, or the scientific conclusions of this study.

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