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Multimedia and English Language Instruction in Universities: A Semantic Literature Review of Technological Advancements

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Abstract: The integration of multimedia technology in English language instruction has revolutionized educational methodologies, particularly in higher education. This study employs a Semantic Literature Review to analyze recent advancements and trends in multimedia applications for English language teaching in universities. Drawing data from international publishers, including Scopus, over the last five years (2019–2024), the review identifies key technological innovations, pedagogical strategies, and their impacts on learner engagement and proficiency. Findings reveal that multimedia tools, such as interactive software, video-based learning platforms, and augmented reality, significantly enhance language acquisition by fostering immersive and adaptive learning environments. Furthermore, the study highlights the challenges of implementation, including technological disparities and faculty readiness, and proposes strategies to optimize multimedia integration. This review contributes to the academic discourse by providing a comprehensive synthesis of existing literature and identifying future directions for multimedia-enhanced English language education in higher education.

Keywords: multimedia technology; english language instruction; higher education; technological advancements

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Introduction

The integration of multimedia in English language instruction has become increasingly urgent due to the evolving demands of education in the 21st century, particularly in higher education institutions. Traditional teaching methods often fail to engage digital-native learners, whose cognitive preferences align more closely with interactive, visually rich, and technology-driven learning environments (Mayer, 2021). Multimedia, encompassing tools such as interactive videos, virtual reality (VR), gamified platforms, and adaptive software, provides a multisensory approach that enhances student engagement and facilitates deeper language acquisition.

Studies have shown that multimedia learning environments significantly improve learners' listening, speaking, and comprehension skills by offering contextualized, immersive experiences that mimic real-life communication scenarios (Hew & Cheung, 2022). Furthermore, the global shift toward online and hybrid learning models, accelerated by the COVID-19 pandemic, underscores the necessity

of adopting advanced technological solutions to ensure continuity and quality in education (Anderson & Kanuka, 2020). Despite its potential, the implementation of multimedia in English instruction remains underexplored, particularly in terms of its scalability, effectiveness, and challenges in diverse educational contexts.

The role of technology in enhancing higher education learning environments has become pivotal in fostering innovation, engagement, and accessibility in teaching and learning processes. Advances in educational technology, including the use of multimedia tools, learning management systems (LMS), and artificial intelligence (AI)-driven applications, have transformed traditional pedagogical models into more dynamic and student-centered approaches (Anderson & Kanuka, 2020). These technologies enable personalized learning experiences, allowing students to progress at their own pace while receiving real-time feedback and support, which is particularly beneficial in diverse educational settings (Mayer, 2021).

Moreover, technology enhances collaboration through tools such as virtual classrooms and interactive discussion platforms, promoting active participation and critical thinking skills. In the context of English language education, technology offers immersive learning experiences through tools like augmented reality (AR), gamification, and adaptive multimedia applications, which improve linguistic competencies and cultural understanding (Hew & Cheung, 2022). The widespread adoption of online and blended learning models in higher education demonstrates technology's capacity to expand educational reach, providing equitable opportunities for learners in remote or underserved regions (Picciano, 2019).

Despite the growing adoption of multimedia technologies in English language instruction, there remains a significant gap in the literature regarding comprehensive reviews that analyze their implementation, effectiveness, and challenges, particularly in higher education. Existing studies tend to focus on isolated tools or specific case studies, lacking a holistic perspective that synthesizes trends, pedagogical impacts, and technological advancements over time.

Moreover, limited research addresses the scalability and contextual adaptability of multimedia applications across diverse educational environments, leaving educators and policymakers without a clear framework for informed decision-making. This gap highlights the need for a systematic and semantic literature review to provide an integrative analysis of multimedia-based English instruction, bridging theoretical insights with practical applications to enhance learning outcomes in universities.

The aim of this study is to analyze recent technological advancements in multimedia tools designed for English language teaching within higher education, exploring how these innovations contribute to more effective and engaging learning experiences. Additionally, the research seeks to evaluate the pedagogical impacts of these technologies, identifying their strengths and limitations in fostering language acquisition and learner engagement. Based on the findings, the study will propose actionable recommendations and future directions to optimize multimedia integration, ensuring its scalability and adaptability in diverse higher education contexts.

This study focuses on analyzing publications from Scopus and other reputable international databases from 2019 to 2024, ensuring the inclusion of the most recent and relevant advancements in multimedia-based English language instruction. The scope is limited to the higher education context globally, providing a comprehensive understanding of technological and pedagogical practices across diverse academic environments.

Research Method

This study adopts a Semantic Literature Review framework, guided by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology, to systematically analyze recent advancements in multimedia-based English language instruction within higher education. The Semantic Literature Review enables a nuanced exploration of themes, trends, and patterns in the literature by employing semantic techniques.

Data were collected from leading academic databases, including Scopus, IEEE Xplore, and SpringerLink, focusing on peer-reviewed journal articles, conference proceedings, and review papers published between 2019 and 2024. The inclusion criteria emphasized studies that addressed multimedia technologies in English teaching, evaluated their pedagogical impacts, or explored implementation strategies.

The data were analyzed using NLP-based semantic tools to identify key themes and synthesize findings into actionable insights. This approach facilitated the categorization of multimedia tools, assessment of their effectiveness, and identification of challenges and best practices. The PRISMA flowchart ensured a systematic and transparent selection of relevant studies. By employing this methodology, the research provides a comprehensive understanding of multimedia integration in higher education, offering valuable recommendations for optimizing its implementation and informing future research.

Results & Discussions

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) method was chosen in the literature search and selection process because of its ability to provide a systematic, transparent, and replicable approach. With PRISMA, this process not only identifies relevant journals, but also ensures that selected articles meet strict quality and relevance criteria to support research. PRISMA's flow helps to minimize bias in literature selection, resulting in a reliable collection of articles for compiling a comprehensive and in-depth literature review.

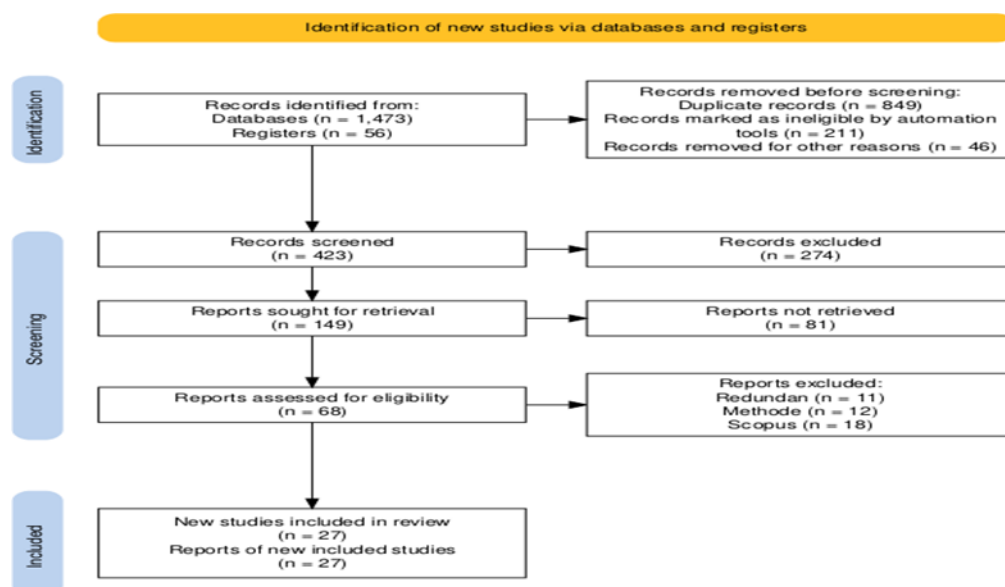


Figure 1. Journal selection process using the PRISMA method

The process of searching for this journal is carried out by following the flow of the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) method. This method is designed to provide a systematic and transparent approach to screening and selecting relevant literature.

Table 1. Results of Selected Journals

No	Title	Year	Author(s)	Method	Novelty
1	The Arabic Teacher E-Learning	2024	MMED Ahmad	Case Study	Integrating e-learning tools for bilingual education in English and Arabic
2	The Impact of Speaking on the other English Language Skills	2024	AHEAA Ahmed	Case Study	Analysis of speaking's effect on other English skills using multimedia devices
3	Developing Video-Based Learning for Providing Advice on English Job Interviews	2024	RA Cepa	Experimental Design	Developing tailored video-based learning for career-focused English instruction
4	Research on English Learning Content Rendering and Interactive Application Based on Multimedia Technology	2024	L Li	Semantic Analysis	Integration of BERT and GPT2 in multimedia content rendering for English learning
5	Modern Trends of Language Learning: The Role of TikTok in the Development of Oral Language Skills in English	2024	HA Kim	Qualitative Analysis	Explores TikTok's effectiveness in oral English skill development
6	Enhancing English Speaking Skills through Film Integration	2024	N Hajikaleng	Classroom Intervention	Integrating English films as multimedia tools in higher education
7	The Implementation of Video Advertising Project in English for Tour Operations	2024	IU Chaerunnisah, M Nova	Project-Based Learning	Employing multimedia projects to enhance vocational English education
8	Podcast Listening Behavior and English Learning Among First-Year Students	2024	K Mahachanawong	Survey Analysis	Examines podcasts as multimedia tools for enhancing listening skills in higher education
9	Technology in Teaching English to Islamic Education Department Students	2024	V Rosa	Mixed-Methods	Investigating multimedia integration in Islamic higher education
10	Classroom Application of English Language and Literature Wisdom Based on AI	2025	B Yun	Experimental AI Framework	Utilizing AI-based tools for contextual English language teaching

11	Research on English Learning Content Rendering and Interactive Application	2024	L Li	Semantic Analysis	Integrating BERT and GPT2 in multimedia content rendering
12	Reflective Journals and Pre- service EFL Teachers' Professional Development	2025	I El Kassimi, M Jmila	Correlational Study	Exploring the role of reflective journals in teacher development
13	The Use of Coding-Based Learning Material (CBLM) in Promoting Critical Reading Skills	2024	Y Ilantri, S Setyarini	Mixed Methods	Novel application of coding for language learning
14	The Influence of Using “Hello Talk” Smartphone Application on Listening Class	2024	MH Mayekti, ACY Bestary	Experimental Study	Evaluates mobile applications' effectiveness in language acquisition
15	Investigating Students' Multimodal Literacy on Prose	2024	A Rahmah, E Fitriyana	Qualitative Analysis	Investigates how multimodal literacy impacts language education
16	Exploring Songs as a Novel Tool for Enhancing Arabic and English Language Learning	2024	RA Erlangga, B Bahroni	Action Research	Uses songs to bridge language learning in Islamic university context
17	Designing E-Module of Translation and Interpretation Using Kvisoft Flipbook Maker	2024	FD Fadilah, NA Zulkifli	Development Research	E-module design for English translation education
18	The Use of Kahoot Application as a Learning Media	2025	Y Juniardi, D Rahmawati	Experimental Study	Digital gamification in language learning
19	The Impact of English-Speaking Content Videos on Instagram	2024	S Prayoga, F Martina	Experimental Analysis	Examines Instagram's role in enhancing speaking skills
20	Perancangan Media Evaluasi Mata Pelajaran Bahasa Inggris Menggunakan Wordwall	2024	H Fitri, S Derta	Case Study	Integrating Wordwall for interactive learning assessments
21	Integrating Motor Development Activities into English Language Learning	2024	A Ahmad, ME Putri, A Asnawi	Mixed Methods	Menggunakan media berbasis gerak untuk pembelajaran bahasa Inggris

23	The Use of Virtual Reality (VR) on English Students' Speaking Skills in Educational Context	2024	GA Sudiana, MH Santosa	Systematic Literature Review	Penggunaan teknologi VR dalam peningkatan keterampilan berbicara bahasa Inggris
24	Review of Studies on Augmented Reality in the Field of Education	2024	ŞN Kalender Yıldırım, V Demirer	Bibliometric Review	Analisis studi tentang realitas augmentasi di pendidikan
25	Concept Analysis of Adaptive Learning Strategy in English Language Teaching	2024	JMN Saldivar, BL Fernandez	Conceptual Framework	Strategi pembelajaran adaptif dalam pengajaran bahasa Inggris
26	Exploring Trends of Web- Based Vocabulary Learning Apps in Indonesian Research	2024	M Muallim, M Mustain, SM Ulfa	Literature Review	Aplikasi berbasis web untuk pembelajaran kosakata dalam penelitian Indonesia
27	Digital Literacy Trends in Islamic Perspective in Higher Education	2024	MF Adima, I Syafe'i, S Zulaikha	Bibliometric Review	Tren literasi digital dalam perspektif Islam untuk pendidikan tinggi

Discussion

The use of multimedia technology in English language learning within higher education has demonstrated a multitude of significant benefits, reshaping the educational landscape. One notable aspect is the integration of e-learning platforms, which Ahmad (2024) identifies as effective tools for supporting bilingual education, particularly in contexts involving English and Arabic. This dual-language approach not only enhances language proficiency but also fosters a deeper cultural understanding among students, allowing them to navigate both languages more effectively. The findings from Ahmed (2024) further corroborate this, emphasizing that interactive media can lead to marked improvements in students' speaking skills when compared to traditional teaching methods. This highlights the need for educators to transition from conventional pedagogical strategies to more engaging, technology-driven approaches that resonate with today's learners.

Moreover, social media platforms like TikTok have emerged as innovative tools in English language instruction. Kim (2024) reveals how TikTok enhances student motivation and speaking skills, leveraging a medium that is already familiar and appealing to students. This relevance to students' lifestyles not only boosts engagement but also encourages them to practice language skills in a fun, informal context. The brevity and creativity of TikTok videos allow learners to digest content quickly and experiment with language use in a way that traditional methods may not facilitate. By incorporating such platforms into the curriculum, educators can create a more dynamic and interactive learning environment that aligns with students' interests.

Cepa (2024) expands on this idea by utilizing learning-based videos to prepare students for real-world scenarios, such as job interviews conducted in English. This practical application of multimedia not only enhances language skills but also equips students with essential professional competencies. By simulating actual workplace

interactions, students can practice and refine their communication skills in a safe environment, thereby increasing their confidence and readiness for future employment. The integration of advanced technologies like BERT and GPT-2 into multimedia learning frameworks, as discussed by Li (2024), further enhances the personalization of education. These AI-driven tools allow for tailored learning experiences, accommodating individual student needs and learning paces. This level of customization is crucial in today's diverse educational settings, where learners come with varying backgrounds, proficiency levels, and learning styles. By employing these technologies, educators can provide targeted feedback and support, creating a more inclusive and effective learning atmosphere.

In the realm of values-based education, Adima et al. (2024) highlight the role of digital literacy in not only improving English language skills but also reinforcing students' cultural and religious values. This intersection of technology and values education is particularly vital in today's globalized world, where students must navigate complex cultural landscapes. By integrating multimedia tools that promote both language proficiency and cultural awareness, educators can prepare students to become more empathetic and culturally competent individuals.

Specific skill development through multimedia is another critical area of focus. For instance, Hajikaleng (2024) utilizes films to enhance students' speaking skills, while Mahachanawong (2024) employs podcasts to bolster listening abilities. These multimedia resources provide students with diverse auditory and visual stimuli, catering to different learning preferences and enhancing overall language acquisition. By exposing learners to authentic language use in various contexts—such as films and podcasts—educators can create richer, more immersive language experiences.

Furthermore, the use of gamification techniques, as researched by Juniardi & Rahmawati (2025) through the Kahoot application, has proven effective in increasing student participation and engagement. By transforming learning into a game-like experience, students are more likely to participate actively and enjoy the learning process. This not only fosters a competitive spirit but also encourages collaboration among peers, enhancing social interaction and communication skills.

Overall, these studies collectively underscore the transformative potential of multimedia technology as a relevant and effective learning tool in the digital age. The integration of multimedia not only enhances learning outcomes but also provides a more inclusive and contextual learning experience that can cater to diverse student needs. With a systematic approach applied through the PRISMA method, the selected journals offer a robust foundation for supporting the implementation of multimedia in higher education. This integration is essential not only for improving English language skills but also for preparing students to meet global challenges, ensuring they are well-equipped for the demands of the modern world.

As we look to the future, it is critical for educational institutions to continue exploring and investing in multimedia technologies that foster engaging, effective, and personalized learning experiences. Collaboration among educators, technologists, and policymakers will be vital in creating environments where multimedia can thrive, ultimately enhancing the quality of education and the readiness of students for the complexities of contemporary society.

Conclusion

The integration of multimedia technology in English language learning within higher education has demonstrated significant effectiveness in enhancing students' language skills, boosting learning motivation, and improving digital literacy. The adoption of cutting-edge innovations such as BERT and

GPT-2, alongside popular social media platforms like TikTok, exemplifies how multimedia-based learning can create a relevant and dynamic educational experience. These technologies not only engage students but also reinforce essential educational values, ensuring that learners develop both linguistically and culturally.

Research indicates that multimedia tools effectively support language acquisition, providing immersive and interactive environments that prepare students to navigate the complexities of the modern workforce. As globalization and technological advancements reshape the landscape of education, it is crucial for students to be equipped with the skills and competencies necessary to thrive in a digital era.

Looking ahead, there is a pressing need for further exploration into AI-driven personalized learning and deeper integration of gamification strategies. These advancements hold the potential to tailor educational experiences to individual student needs, fostering engagement and enhancing learning outcomes. By leveraging data analytics and adaptive learning algorithms, educators can create customized learning paths that address diverse learning styles and paces.

Collaboration among educational institutions, technology developers, and researchers will be essential to advance the field of multimedia education. Such partnerships can facilitate the development of more inclusive and adaptive learning methodologies, ensuring that educational environments are responsive to the evolving needs of modern students. This collaborative approach will not only enhance the effectiveness of multimedia tools but also promote a holistic educational experience that prepares students for future challenges.

In conclusion, the successful integration of multimedia technology in English language learning requires ongoing commitment and innovation. By embracing emerging technologies and fostering collaborative efforts, the educational community can create dynamic learning environments that not only improve language proficiency but also empower students to succeed in a rapidly changing world

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