

The Role of Modern Technologies in Language Teaching and Learning: Toward Interactive Digital Multimodal Environments

دور التقنيات الحديثة في تعليم اللغة وتعلمها: نحو بيئات رقمية تفاعلية متعددة الوسائط

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Abstract:

Objectives: This study aimed to investigate the role of modern technologies in language teaching and learning through the analysis of experiences reported by a sample of 150 individuals, representing 37.6% of a total population of 450.

Methods: The study examined diverse educational tools, including video conferencing platforms, learning management systems (LMS), smart applications, and augmented/virtual reality technologies, data were collected primarily via individual interviews, providing comprehensive insights into participants' experiences.

Results: Results indicated that video conferencing platforms, particularly Zoom and Microsoft Teams, were the most frequently used (38.67%), followed by LMS platforms (16.67%). Listening skills were identified as the most positively impacted (34%), whereas insufficient technological infrastructure emerged as the primary challenge (42%). The findings underscore the necessity of enhancing digital infrastructure and offering professional training for educators to effectively adapt to digital transformation in language learning environments.

Keywords: Modern technologies; digital environments; multimedia.

الملخص:

الأهداف: هدفت هذه الدراسة إلى استكشاف دور استخدام التقنيات الحديثة في تعليم وتعلم اللغات من خلال تحليل تجارب عينة مكونة من 150 فردًا تم اختيارهم من إجمالي مجتمع الدراسة البالغ 450 فردًا، أي بنسبة 37.6%.

المنهجية: استخدم الباحث المقابلات الفردية كأداة رئيسية لجمع البيانات، مما أتاح له التعرف على خبرات أفراد العينة بشكل معمق. تناولت الدراسة مجموعة من الأدوات التعليمية مثل منصات مؤتمرات الفيديو، وأنظمة إدارة التعلم (LMS)، والتطبيقات الذكية، وتقنيات الواقع المعزز/الواقع الافتراضي. أظهرت النتائج أن أكثر التقنيات استخدامًا كانت منصات مؤتمرات الفيديو مثل Zoom و Microsoft Teams بنسبة 38.67%، تلتها منصات إدارة التعلم بنسبة 16.67%. كما تبين أن مهارات الاستماع كانت الأكثر استفادة من هذه التقنيات بنسبة 34%، في حين كانت أكبر التحديات التي تم الإبلاغ عنها هي ضعف البنية التحتية التكنولوجية بنسبة 42%. وتشير هذه النتائج إلى أهمية تطوير بنية رقمية قوية وتدريب الكوادر التعليمية لمواكبة التحول الرقمي في بيئات تعلم اللغات.

الكلمات المفتاحية: التقنيات الحديثة؛ البيئات الرقمية؛ الوسائط المتعددة.

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1 Introduction

The field of language teaching and learning has undergone a profound transformation in recent decades due to the digital revolution and the rapid development of information and communication technologies (Hamza, 2022). This shift has moved educational practices from traditional methods to interactive digital environments supported by modern technologies. These environments empower learners to develop their language skills more effectively and engagingly, moving away from rote learning and conventional approaches.

Multimedia tools, augmented reality (AR), virtual reality (VR), e-learning platforms, and artificial intelligence (AI) applications are among the most prominent digital tools that have revolutionized the field of language learning (Golonka et al., 2014). Recent studies have demonstrated that such technologies contribute to creating flexible learning environments that overcome time and space limitations, enabling real-time interaction with content, instructors, and peers. This fosters both self-directed and collaborative learning (Al-Khalifi, 2023; Kucuk, & Daskan, 2024).

Youssef (2023) found that integrating interactive digital environments improves communicative competence in English language learners, especially through the use of educational videos and digital language games. El-Sayed (2021) emphasized the importance of incorporating digital strategies that account for individual learning differences and support the development of the four core language skills: listening, speaking, reading, and writing. In light of this, it is essential to adopt multimedia-rich educational models that meet diverse learner needs and focus on building both pedagogical and technical competencies among teachers. Albiladi & Abdeen (2019) concluded that the successful integration of modern technologies in language instruction largely depends on teacher training and the quality of digital content. Accordingly, this study aims to explore the role of modern technologies in language teaching and learning, highlight effective digital tools, describe the features of interactive multimodal environments, and analyze relevant literature, with the goal of offering recommendations to enhance and improve language education practices in the digital era.

1.1 Problem Statement

Despite significant advancements in educational technology and the availability of various digital tools that support language learning, the integration of these technologies into educational environments still faces numerous challenges in terms of practical implementation and effectiveness. Although language learning applications, e-learning platforms, and interactive multimedia resources are widely available, their actual integration into classroom practices often lacks systematic planning and is sometimes limited to superficial or sporadic use, falling short of achieving the desired educational outcomes.

The core problem lies in the evident gap between the available technological capabilities and the traditional teaching practices still prevalent in language education. This gap negatively impacts the quality of learning outcomes and limits the comprehensive and effective development of language skills. Additionally, some teachers and learners lack the necessary digital competencies to fully utilize these multimedia tools. There is also a notable absence of pedagogical strategies that align with the foundational principles of digital learning environments. Moreover, there is a shortage of applied and experimental studies that assess the impact of modern technologies on language education, particularly in relation to variables such as interaction, motivation, comprehension, and autonomous learning. This underscores the urgent need for research in this area to develop effective, technology-supported educational models based on principles of interactive multimodal learning.

Hence, the study seeks to answer the following primary research question:

To what extent do modern technologies contribute to the development of language teaching and learning within interactive digital multimodal environments?

From this central question, the following sub-questions emerge:

- What are the most prominent modern technologies used in language teaching?
- How do these technologies enhance learners' language acquisition skills?
- What challenges hinder the use of modern technologies in language education?

1.2 Significance of the Study

The importance of this research lies in the context of the rapid digital transformation witnessed in education, particularly in the field of language teaching and learning. The growing need for modern technologies that enable interactive, multimodal learning environments makes it essential to examine their role and effectiveness. This study sheds light on how these technologies can be employed to enhance language skills and achieve more

effective and engaging learning, aligned with the needs of 21st-century learners and the evolving landscape of educational practices.

The study is significant for the following reasons:

- It clarifies the impact of technology on the quality of language learning.
- It supports teachers in adopting more effective instructional technologies.
- It contributes to the development of interactive digital curricula.

1.3 Objectives of the Study

- To identify the most significant modern technologies used in language education.
- To define the characteristics of interactive digital learning environments.
- To assess the impact of multimedia on facilitating language learning.

1.4 Definitions of Terms

• Modern Technologies:

Theoretical Definition: Advanced digital tools that rely on the internet, artificial intelligence, and multimedia to support the educational process (Almalki, 2022).

Operational Definition: Any digital tool or application (e.g., Zoom, Moodle, Duolingo, generative AI) used in interactive digital environments for language teaching and learning.

• Multimedia:

Theoretical Definition: A collection of media such as text, sound, images, video, and animation used to present information in an integrated manner (Mayer, 2021).

Operational Definition: Digital content that employs auditory and visual elements to deliver language instruction.

• Interactive Digital Environments:

Theoretical Definition: Online educational systems that enable real-time interaction between learners, instructors, and content, and offer assessment tools and digital learning activities (Salmon, 2020).

Operational Definition: Educational platforms or applications (e.g., Google Classroom, Padlet, Kahoot) that facilitate live interaction among all participants in the language education process.

1.5 Scope and Limitations of the Study

This study is limited to the topic of modern technologies in language teaching and learning within interactive digital multimodal environments, conducted during the year 2025. It adopts a qualitative research approach and uses interviews as its primary data collection tool. A purposive sample of 150 faculty members specializing in Arabic, English, and French was selected from colleges of education and arts at several Sudanese universities.

2 Theoretical Framework and Previous Studies

2.1 Introduction to Digital Transformation in Education and the Evolution of Technology Use in Language Teaching

In light of rapid digital transformations, education is witnessing a true revolution in concepts and practices. The field of language teaching has not been exempt from this shift, as technology has become an integral part of the educational process. Godwin-Jones (2020) emphasized that digital transformation has fundamentally changed the way languages are learned, opening new horizons for linguistic interaction and engagement beyond the traditional classroom.

• Introduction to Digital Transformation in Education

Digital transformation in education is the process of integrating digital technology into all aspects of the educational process, including planning, teaching, and assessment. It involves a shift from paper-based learning to electronic environments that rely on the internet, apps, and digital platforms (Abdullah, 2023). In language education, digital transformation offers vast opportunities for interactive, individualized, and multimedia learning, which enhances language skills more efficiently (Li, 2021).

• The Evolution of Technology Use in Language Teaching

The use of technology in language teaching started modestly with language labs and gradually developed to include digital media, smart applications, and global educational platforms (Reinders & Benson, 2023). According to Tahaoui (2022), digital content has improved learner motivation and facilitated access to real-life language use beyond the classroom.

Stages of Development:

- Pre-2000: Traditional aids such as tapes and audio recordings.
- 2000–2010: The spread of e-learning and educational websites.
- 2010–2020: The rise of educational apps such as Duolingo and Memrise.
- 2020–Present: Integration of AI, augmented reality, and adaptive learning.
- **Modern Technologies in Language Teaching**

Modern technologies include:

- Artificial Intelligence (AI): Used to analyze learner errors and provide personalized content (Wang & Winstead, 2022).
- Interactive Applications: Such as Rosetta Stone, which offers pronunciation and repetition exercises.
- Augmented Reality (AR): Used to present vocabulary in real-life environments (Kukulska-Hulme, 2024).
- Language Games: Which incorporate entertainment into skill-building.

These technologies have proven effective in enhancing the core language skills—listening, speaking, reading, and writing—across various age groups (Godwin-Jones, 2020).

• Multimedia and Its Role in Language Teaching

Multimedia includes text, audio, images, video, and illustrations. These tools engage multiple senses simultaneously, resulting in deeper and faster learning (Abdullah, 2023).

For example:

- Interactive videos enhance audiovisual comprehension.
- Audio recordings improve pronunciation skills.
- Images and illustrations support visual memory of words and meanings.
- **Digital Linguistic Interaction**

Interaction has become a core element in digital language learning environments, taking place through:

- Text and voice chats.
- Live video discussions.
- Language simulations using AI applications.

Reinders & Benson (2023) emphasized that digital interaction increases real-life language practice opportunities and helps learners gradually build linguistic competence.

The integration of technology in language education is no longer optional—it has become a necessity that requires careful planning and continuous development. Digital transformation, with its tools, media, and interactive elements, offers an ideal environment for learning languages in new and effective ways. However, this shift demands institutional support and ongoing training for both educators and learners.

2.2 Previous Studies

In the context of rapid digital transformation, artificial intelligence (AI) has emerged as an effective tool in enhancing educational processes, particularly in the field of English as a Foreign Language (EFL) instruction. AI-powered tools—such as chatbots and smart applications—have contributed significantly to improving learners' vocabulary, writing, and speaking skills through interactive and personalized learning environments. Consequently, there has been growing academic interest in investigating the impact of these technologies on language learning, exploring students' perceptions, and analyzing the challenges associated with their use. These studies provide a scientific foundation for understanding the role of AI in language education and support the development of evidence-based pedagogical practices.

AI in EFL: New Horizons in Vocabulary, Skills, and Interaction:

AI technologies have brought about a paradigm shift in EFL education. There is an increasing number of applications designed to support various language skills using interactive tools powered by intelligent algorithms. In this regard, the FLS (2025) study provided a comprehensive review of 58 experimental studies in university settings, concluding that AI tools are highly effective in enhancing vocabulary acquisition, particularly through automatic content generation. It recommended culturally and linguistically adapting these tools to better suit learners' backgrounds.

In the area of writing, Yıldız & Demirtaş (Türkiye, 2025) explored Turkish university students' perceptions of AI use and its impact on writing anxiety. Findings revealed moderate acceptance, with anxiety levels remaining average, leading the researchers to recommend psychological and technical support along with targeted training in using AI writing tools.

For speaking skills, Zhang et al. (System Journal, China, 2024) highlighted the role of AI voice systems in boosting learner enjoyment and willingness to communicate, while significantly reducing speaking anxiety. The study stressed the importance of integrating these systems into daily classroom activities.

Li & Wang (System Journal, 2024) supported these findings by focusing on interaction with AI chatbots and their impact on fluency, pronunciation, and confidence, thereby advocating for their use as pronunciation training tools in classrooms.

Meanwhile, Al-Harthi (Oman, 2024) examined AI applications in vocabulary learning among high school and university students. Despite high usage rates, technological confidence varied, prompting a recommendation for more hands-on training and awareness of AI capabilities.

In a recent Saudi study at Majmaah University, Al-Shehri (2025) investigated smart chat tools and their influence on oral fluency among education students. The results showed significant improvement in speaking performance, though challenges such as internet speed and user interface complexity were noted, leading to recommendations for enhanced technical infrastructure and content customization.

Wang et al. (China, 2025) explored the link between AI proficiency and willingness to communicate. Their results demonstrated that technical competence and trust in AI tools directly influence learners' motivation to participate, calling for the integration of AI literacy training into language curricula.

Regarding enjoyment as a driver for sustained learning, Liu et al. (Heliyon, China, 2024) analyzed how positive attitudes and fun experiences with AI tools influence learning persistence. Their findings supported the design of playful, interactive AI-based curricula to promote continuous learning.

Focusing on extended reality (XR), Nguyen & Surya (FLS, 2025) studied students from Thailand and Indonesia and found that integrating metaverse and AI technologies significantly enhanced learners' self-confidence and communicative competence, emphasizing the potential of XR in realistic interaction simulations.

Finally, Zhao et al. (System Journal, 2024) explored the use of ChatGPT in autonomous English learning through student interviews. Interactivity, enjoyment, and trust emerged as key motivators, with a notable reduction in learning anxiety. The study recommended enhancing the human-like interactivity of AI systems and integrating ChatGPT into self-learning strategies.

Collectively, these studies suggest that AI tools represent a promising future for EFL instruction, offering technical support, motivating interaction, and personalized content delivery. However, realizing these benefits requires robust infrastructure, continuous training, and genuine integration into educational systems.

Commentary on Previous Studies:

1. Points of Agreement Between the Current Study and Previous Research

The comparison with existing literature revealed several clear points of agreement, which reinforce the credibility of the present study and suggest consistency in certain variables across contexts:

- **The Impact of Technology on Language Learning:** Most studies, including the current one, agree on the positive impact of modern technologies in developing various language skills—listening, speaking, reading, and writing. This finding is supported by studies such as Alshammari (2022) and Yilmaz & Bayraktar (2021).
- **Commonly Used Technologies:** A consensus emerged around the frequent use of tools like Zoom, YouTube, Learning Management Systems (LMS), and ChatGPT in language education research, indicating their widespread adoption across different educational settings.
- **Shared Challenges:** Key challenges cited across studies include poor technological infrastructure and insufficient teacher training, as highlighted in Rahman et al. (2020) and Sari & Wahyuni (2023).
- **General Recommendations:** Most studies echoed the current study's emphasis on teacher training, improved digital infrastructure, and supportive environments to ensure effective technology integration in language education.

2. Points of Divergence Between the Current Study and Previous Research

Despite general alignment, notable differences emerged that reflect the unique research environment of the current study:

- **Perspective on Technological Impact:** While some studies linked technology use to psychological factors such as language anxiety and academic pressure (e.g., Li & Chen, 2021), the present study places stronger emphasis on motivation and self-confidence, offering a more positive behavioral perspective that is less prominent in international studies.

- **Advanced Technologies:** The current study observed limited use of extended reality (XR) or metaverse tools among its participants, unlike international studies such as Nguyen & Surya (2023), which focused extensively on these technologies—indicating differing levels of digital maturity between educational contexts.
- **Psychological and Behavioral Barriers:** A key focus of the current study was on learners' lack of self-motivation as a major obstacle to technology use, whereas previous literature predominantly addressed technical and institutional factors.
- **Cultural Adaptation of Content:** The current study uniquely stressed the importance of culturally and linguistically adapting educational content to learners' local contexts—a point often overlooked in global studies that prioritized technical frameworks over cultural sensitivity.

Unique Contributions of the Current Study:

- This study is among the rare Arabic-language works combining analysis of the prevalence, impact, and challenges associated with the use of modern technologies in language learning within the context of AI.
- It incorporates a wide variety of digital tools, including smart apps, platforms, virtual classrooms, virtual reality, videos, and podcasts, offering a comprehensive perspective.
- The study merges quantitative analysis (150 participants) with qualitative interpretation supported by recent international research, enhancing both the validity and applicability of its findings.
- It centers on learner perceptions in an Arab educational context, enriching the literature with new data and comparative insights.
- It proposes practical and actionable solutions, including technical training, infrastructure improvement, and gradual AI integration into educational practices.

3 Field Study Procedures

3.1 Research Methodology

The researcher employed the descriptive-analytical method using a qualitative approach, as it aligns well with the nature of this study.

The Qualitative Methodology is a research approach that focuses on understanding human and social phenomena through exploring experiences, behaviors, and the meanings individuals attribute to those phenomena. Data collection is typically conducted using tools such as in-depth interviews, observation, and content analysis. It relies on descriptive rather than statistical analysis, emphasizing context and depth over generalization.

As noted by Creswell & Poth (2018), qualitative research is used to understand complex issues in their natural settings and involves collecting and analyzing non-numerical data to reveal patterns and deep insights.

3.2 Study Population and Sample

The study population consisted of faculty members from the Colleges of Education and Arts in Sudanese universities, specializing in Arabic, English, and French languages, with a total number of approximately 450 members.

Given the exceptional circumstances Sudan is currently facing, a purposeful stratified sample of 150 faculty members from the same specializations and colleges was selected. This sampling strategy was adopted to ensure appropriate representation of the target groups in line with the study's objectives. The sample constitutes 37.5% of the total population.

Below is a table showing the characteristics of the study sample:

Table 1: Distribution of sample members by university and college

N	University	Faculty	Frequency	Percentage
1	Omdurman Islamic University	Education	15	10.00
		Arts	10	6.67
2	University of Khartoum	Education	13	8.67
		Arts	11	7.33
3	Alzaïem Alazhari University	Education	9	6.00
4	Al-Neelain University	Education	9	6.00
5	University of Gezira	Education	10	6.67
6	University of Bahri	Education	9	6.00
7	University of El-Geneina	Education	8	5.33
8	University of Nyala	Education	8	5.33
9	University of Sennar	Education	11	7.33
10	University of Blue Nile	Education	9	6.00
11	University of Shendi	Education	8	5.33
12	Sudan University of Science and Tech	Education	10	6.67
13	University of Kordofan	Education	11	6.67
14	Total		150	100

The table above (Table 1) presents the distribution of the study sample, comprising 150 faculty members, across various Sudanese universities and their respective faculties. This study aims to investigate the role of modern technologies in language teaching and learning within interactive multimedia digital environments.

The sample was purposively stratified, selecting faculty members primarily from the Colleges of Education and Arts at different Sudanese universities, specializing in Arabic, English, and French languages. The sample distribution ensured geographical and institutional balance among the participating Sudanese universities.

As shown in the table, Omdurman Islamic University had the highest number of participants, with 15 faculty members from the College of Education (10.00%) and 10 from the College of Arts (6.67%). It was followed by the University of Khartoum, with 13 participants from the College of Education (8.67%) and 11 from the College of Arts (7.33%). The participation rates from other universities, such as Nilein University, the former Juba University (Bahri), Gezira University, Nyala University, and Sennar University, ranged between 5.33% and 7.33%, all from Colleges of Education.

The total number of participants was 150, representing 100% of the sample size. This table accurately reflects the proportional representation of the sample, providing a precise understanding of the diversity in participants' backgrounds and educational institutions. This distribution contributes to ensuring the comprehensiveness of the findings and their partial generalizability to the reality of university education in Sudan, especially given the exceptional circumstances the country is currently experiencing.

Table 2: Distribution of Sample by Faculty and Specialization

N	Faculty	Specialty	Frequency	Percentage
1	Education	Arabic language	45	30%
2	Education	English language	40	26.67%
3	Education	France Language	19	12.67%
4	Arts	Arabic language	16	10.67%
5	Arts	English language	17	11.33%
6	Arts	France Language	13	8.67%
Total			150	100%

As the table shows, the majority of participants were from the College of Education, with 104 members distributed as follows: 45 (30.00%) in Arabic Language, 40 (26.67%) in English Language, and 19 (12.67%) in France Language. The College of Arts contributed 46 members: 16 (10.67%) in Arabic Language, 17 (11.33%) in English Language, and 13 (8.67%) in France Language.

Overall, the Arabic Language specialization had the highest representation with 61 participants (40.67%), followed by English Language with 57 participants (38%), and then France Language with 32 participants (21.33%) of the total sample.

Significance of the Distribution: This distribution reflects the diversity and comprehensiveness of the sample across various linguistic specializations. This enhances the credibility of the findings and enables accurate comparisons between the two faculties regarding their approaches to integrating modern technologies in language teaching and learning. Moreover, this balanced proportional representation allows for an examination of differences between specializations and faculties in light of digital variables.

3.3 Study Instrument

The researcher utilized individual interviews as the study instrument, posing questions to faculty members in the Colleges of Education and Arts at Sudanese universities. The specializations covered were Arabic, English, and France languages. In this type of interview, questions were predetermined, formulated, and arranged to serve the study's objectives. The researcher was not permitted to deviate from these predefined questions. All participants were asked the questions using the same wording and order. The researcher presented three open-ended questions to extract findings and understand the role of modern technologies in language teaching and learning, specifically towards interactive multimedia digital environments. The researcher conducted individual interviews with 150 faculty members in the Colleges of Education and Arts at Sudanese universities, covering the specializations of Arabic, English, and France, using WhatsApp video calls over the course of a month, which enabled him to reach the targeted sample.

3.4 Instrument Validity:

Content Validity:

The study instrument was presented to a group of six expert reviewers in the field to solicit their opinions on the questions. An agreement was reached to rephrase one of the interview questions.

Construct Validity:

The researcher selected a set of principles and foundations that researchers had addressed in the theoretical framework, which were consistent with previous studies.

Instrument Reliability:

To establish the reliability of the interview, the researcher employed two methods:

- Analysis of participants' responses across individuals.
- Holsti's formula to verify the reliability of the content analysis.

Holsti's Formula:

$$= \frac{\text{Number of Agree – Upon Ideas} \times 2}{\text{Total Analysis} + \text{Total Number of Ideas in Second Analysis}}$$

* Number of Questions: 3

* Number of Ideas per Question: 5

* Total Ideas Analyzed per Axis (for each analyst): 3 \times 5 = 15 ideas

* Agreed-Upon Ideas: 12 ideas out of 15

Applying the Formula:

$$\frac{2 \times 12}{15 + 15} = \frac{24}{30} = 0.80$$

Therefore, the reliability coefficient is (0.80).

4 Study Results

4.1 Results of the Question: What are the most prominent modern technologies used in language teaching?

Table 3: Responses of the study sample regarding the most prominent modern technologies used in language teaching

N	The answers	Frequency	Equation	Percentage
1	Smart educational applications such as Duolingo, Memories, and Busuu, which rely on artificial intelligence and interactive repetition.	22	$\frac{22}{150}$	14.67%
2	Learning Management Systems (LMS) such as Moodle and Google Classroom, which facilitate tracking academic progress and sharing activities.	25	$\frac{25}{150}$	16.67%
3	Virtual classrooms and live broadcasting via platforms like Zoom, Microsoft Teams, etc., which allow real-time interaction between the teacher and learners.	58	$\frac{58}{150}$	38.67%
4	Virtual and Augmented Reality (VR/AR) technologies that create realistic language simulation environments, helping learners immerse themselves in the language.	18	$\frac{18}{150}$	12%
5	Podcasts and educational videos on platforms such as YouTube and TED-Ed, which contribute to improving listening and pronunciation skills	27	$\frac{27}{150}$	18%
Total		150		100%

The results of (Table 3) indicated that video conferencing platforms such as Zoom and Microsoft Teams were the most widely used technologies among the study sample, with a usage rate of 38.67%. This is attributed to the interactive environments they provide, especially after the COVID-19 pandemic, which necessitated a shift toward synchronous learning. This finding is supported by the study of Zhang et al. (2024), which confirmed that the use of voice-based AI tools within virtual classrooms enhances interaction and builds self-confidence in language learning.

On the other hand, learning management systems (LMS) such as Moodle and Google Classroom came in second with a usage rate of 16.67%, reflecting the importance of structured learning environments in tracking learners' performance. Studies such as FLS (2025) indicated that these platforms contribute to improved vocabulary acquisition and the provision of continuous feedback.

Meanwhile, smart applications based on artificial intelligence (like Duolingo and Memories) had a usage rate of 14.67%, aligning with findings from Al-Harthy (2024) and Wang et al. (2025). These studies noted that while such applications are effective in customizing content and offering repetitive interactive activities, they are met with varying levels of acceptance due to differences in learners' technological backgrounds.

As for Virtual and Augmented Reality (VR/AR) technologies, they recorded the lowest usage rate at 12%, despite their effectiveness in simulating language contexts, as demonstrated by the study of Nguyen & Surya (2025). The limited use appears to be due to weak technical infrastructure and lack of training—an issue confirmed by the results of the third research question

From the researcher's perspective, these results reflect that the choice of technological tools depends primarily on ease of use, the level of interaction they provide, and their compatibility with learners' technological environment, alongside the necessity of enhancing infrastructure and providing continuous training to increase the use of advanced technologies such as virtual and augmented reality.

4.2 Results of the Second Question: How do these technologies improve language learning skills?

Table 4: Responses of the study sample regarding the impact of these technologies on improving language learning skills

N	The answers	Frequency	Equation	Percentage
1	Improved listening skills through repeated and diverse audio-visual media.	51	$\frac{51}{150}$	34.00
2	Enhanced reading and comprehension via annotated digital texts and interactive reading.	28	$\frac{28}{150}$	18.67
3	Increased motivation and engagement through elements such as educational games, reward points, and digital badges.	17	$\frac{17}{150}$	11.33
4	Improved writing through auto-correction tools and intelligent feedback systems.	15	$\frac{15}{150}$	10
5	Boosted self-confidence due to self-paced exercises that allow learning without the fear of making mistakes in front of others	39	$\frac{39}{150}$	26
Total		150		

The results of (Table 4) showed that listening skills are the most positively impacted by modern technologies, with a percentage of 34%, followed by increased self-confidence at 26%, and reading and comprehension skills at 18.67%. These findings align with studies such as TED-Ed (2024) and YouTube-enhanced EFL platforms, which indicated that interactive videos contribute to improving auditory comprehension skills and boosting learning motivation.

The results also revealed that motivation and engagement through games and digital reward systems served as a supporting factor at 11.33%. This supports the findings of Liu et al. (2024), who emphasized the role of enjoyment and fun as key drivers for sustained language learning.

Conversely, writing skills had the lowest impact rate at 10%, suggesting a gap in leveraging AI tools in this area. This is despite the findings of Yıldız & Demirtaş (2025), which showed that intelligent correction tools reduce writing anxiety and enhance the quality of written output.

From the researcher's perspective, these results reflect that modern technologies are more effective in supporting skills that rely on auditory and visual reception and interaction, whereas productive skills such as writing require the development of specialized intelligent tools and adequate training for learners to achieve maximum benefit.

4.3 Results of the Third Question: What are the challenges facing the use of modern technologies in language teaching?

Table 5: Responses of the study sample regarding the challenges facing the use of modern technologies in language teaching

N	The answers	Frequency	Equation	Percentage
1	Weak technical infrastructure in some schools and educational institutions.	63	$\frac{63}{150}$	42.00%
2	Lack of teacher training in effectively using technological tools.	48	$\frac{48}{150}$	32.00%
3	Language barriers or untranslated content in many global applications and platforms.	8	$\frac{8}{150}$	5.33%
4	Lack of high-quality educational digital content that is culturally appropriate.	13	$\frac{13}{150}$	8.67%
5	Low self-motivation among some learners to regularly engage with digital activities.	18	$\frac{18}{150}$	12%
Total		150		

(Table 5) revealed that weak technical infrastructure ranked as the top challenge with a rate of 42%, followed by lack of teacher training at 32%. These results are consistent with studies such as Al-Shehri (2025) and Li & Wang (2024), which indicated that poor internet connectivity and limited technical proficiency hinder the effective use of AI tools and intelligent conversation systems in classrooms.

Challenges such as language barriers due to untranslated content (5.33%) and low learner motivation (12%) were reported at lower rates, highlighting the need for localized content tailored to the learners' cultural and linguistic contexts, as recommended by the FLS (2025) study.

From the researcher's perspective, these results reflect that improving technical infrastructure and providing continuous training programs for teachers are essential priorities to ensure the optimal use of modern technologies, alongside the need to develop educational content that is appropriate for the local language and culture to enhance learner engagement and motivation.

Findings:

- Most used technologies: Video conferencing platforms such as Zoom and Microsoft Teams ranked first in usage (38.67%) due to their support for real-time interaction. Learning management systems (LMS) followed in second place (16.67%) for their role in organizing and tracking learning progress. Smart applications like Duolingo and Memories accounted for 14.67%, with usage varying depending on users' technical background. Virtual and Augmented Reality (VR/AR) technologies had the lowest usage rate (12%), despite their effectiveness in simulating language environments.
- Most affected skills: Listening skills showed the greatest improvement from the use of modern technologies (34%). Self-confidence came second (26%), followed by reading and comprehension (18.67%). Educational games and digital rewards enhanced motivation (11.33%). Writing skills were the least affected (10%), indicating underutilization of AI writing tools.

Recommendations:

- Improve digital infrastructure in educational institutions and provide integrated technological environments to support the use of modern educational media.
- Train teachers and learners to effectively use AI tools and educational platforms through workshops and professional development programs.
- Invest in AI-powered writing tools to enhance writing skills, including auto-correction and idea generation tools.
- Design educational content that is translated and culturally localized to overcome language barriers and enhance learners' cultural identity.
- Promote interactive learning methods such as digital games and reward systems for their role in boosting motivation and persistence.
- Encourage future applied research on the impact of artificial intelligence in developing language skills within multimedia-rich environments.

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