

The Impact of Technology Use in Teaching English as a Second Language at Educational Institutions in Sabha City

Monir Ahmed Naser Elmeshri *

Faculty of Education – Tiji, University of Zintan, Tiji, Libya

*Corresponding author: monirelmeshri83@gmail.com

أثر استخدام التكنولوجيا في تدريس اللغة الإنجليزية بوصفها لغة ثانية في المؤسسات التعليمية بمدينة سبها

منير أحمد ناصر المشري *

كلية التربية تيجي، جامعة الزنتان، تيجي، ليبيا

Received: 25-07-2026; Accepted: 29-09-2026; Published: 12-10-2026

Abstract

This study investigated the impact of technology use in teaching English as a second language at educational institutions in Sabha City, analysing the dimensions of this integration and its reflections on learners' linguistic outcomes. The research problem centred on the gap between declared educational policies and actual field practice, the disparity between available technological capabilities and the human competence required to employ them, and the structural and institutional challenges that limit the effectiveness of technological integration. The study proceeded from a main hypothesis positing a statistically significant effect of technology use on linguistic outcomes at $\alpha \leq 0.05$, which branched into three sub-hypotheses concerning the impact of technological tool deployment on the four language skills, the relationship between teachers' digital competence and integration effectiveness, and the existence of differences attributable to institutional challenges. Adopting the descriptive-analytical method, the study used a questionnaire to collect data from 209 participants, teachers and learners, across 18 educational institutions and centres. The findings revealed a high level of technological tool utilisation ($M = 4.02$), a strong positive relationship between technology and language skill development ($M = 4.17$), and the independent variable explained 49.8% of the variance in linguistic outcomes. The study recommends developing digital infrastructure, designing specialised professional development programmes, expanding the deployment of artificial intelligence applications, building strategic partnerships, and establishing institutional policies that regulate digital transformation in language teaching.

Keywords: Educational Technology; Teaching English as a Second Language; Digital Competence; Techno-Pedagogical Integration; Sabha City.

المخلص

هدفت الدراسة الحالية إلى الكشف عن أثر استخدام التكنولوجيا في تدريس اللغة الإنجليزية بوصفها لغة ثانية في المؤسسات التعليمية بمدينة سبها، من خلال تحليل أبعاد هذا التوظيف وانعكاساته على المخرجات اللغوية للمتعلمين. وتمحورت مشكلة البحث حول الفجوة القائمة بين السياسات التعليمية المعلنة والممارسة الميدانية الفعلية، والتفاوت بين الإمكانيات التقنية المتاحة والكفاءة البشرية اللازمة لتوظيفها، فضلاً عن التحديات البنوية والمؤسسية التي تحد من فاعلية الدمج التكنولوجي. وانطلقت الدراسة من فرضية رئيسية مفادها وجود أثر ذي دلالة إحصائية لاستخدام التكنولوجيا في المخرجات اللغوية عند مستوى دلالة ($\alpha \leq 0.05$)، تفرعت عنها ثلاث فرضيات فرعية تتصل بأثر توظيف الأدوات التكنولوجية في المهارات اللغوية الأربع، والعلاقة بين الكفاءة الرقمية للمعلم وفاعلية الدمج، ووجود فروق تُعزى إلى التحديات المؤسسية. واعتمدت الدراسة المنهج الوصفي التحليلي، ووظفت الاستبانة أداة لجمع البيانات من عينة بلغت (209) مشاركين من المعلمين والمتعلمين في (18) مؤسسة ومركزاً تعليمياً. وأظهرت النتائج مستوى مرتفعاً لتوظيف الأدوات التكنولوجية بمتوسط حسابي (4.02)، وعلاقة إيجابية قوية بين التكنولوجيا وتنمية المهارات اللغوية بمتوسط (4.17)، كما فسّر المتغير المستقل ما نسبته (49.8%) من التباين في المخرجات اللغوية. وأوصت الدراسة بتطوير البنية التحتية الرقمية، وتصميم برامج تطوير مهني متخصصة، والتوسع في توظيف تطبيقات الذكاء الاصطناعي، وبناء شراكات استراتيجية، ووضع سياسات مؤسسية تنظم التحول الرقمي في تعليم اللغات.

الكلمات المفتاحية: تكنولوجيا التعليم، تدريس اللغة الإنجليزية لغة ثانية، الكفاءة الرقمية، الدمج التقني التربوي، مدينة سبها.

1. Introduction

The contemporary world is witnessing accelerated transformations driven by the digital revolution across various sectors, foremost among them education, which is reformulating its tools and approaches in light of successive technological developments. The employment of technology is no longer an optional luxury to which teachers may resort whenever they wish; it has become a structural necessity dictated by the variables of the labour market and by the needs of new digital generations raised among screens and smart applications. Amid this changing landscape, foreign language teaching emerges as a fertile field for educational innovation, since it weaves together cognitive, affective, and skill-based dimensions and intertwines the requirements of communicative competence with the demands of openness to other cultures.

In this context, English occupies a pivotal position as the language of science, economics, and global communication, which makes its learning and teaching an educational priority in most educational systems worldwide. Teaching English as a second language, however, confronts a host of challenges related to the weakness of the natural linguistic environment, the limited hours of exposure to the target language, and the disparity in learners' levels. These obstacles have driven researchers to seek technological alternatives capable of overcoming them and enhancing the effectiveness of the educational process.

The employment of technology in classrooms opens wide horizons for English language teachers and learners. Digital tools provide opportunities for interactive training in the four skills, offer virtual environments that simulate authentic linguistic contexts, and enrich educational content with multimedia that stimulates the learner's senses and deepens comprehension. Artificial intelligence and adaptive learning applications also contribute to personalising learning pathways in line with individual differences, thereby elevating the quality of linguistic outcomes and reinforcing learner motivation. Nevertheless, the optimal benefit from these capabilities remains contingent upon a set of mediating factors, most notably the teacher's digital competence, the readiness of infrastructure, the level of institutional support, and the nature of the educational policies regulating technological integration.

Proceeding from these premises, the present study seeks to uncover the impact of technology use in teaching English as a second language by analysing the dimensions of this employment and monitoring its reflections on learners' linguistic outcomes. It adopts the descriptive-analytical method and employs a questionnaire to collect field data from a sample representative of the study population.

2. Research Gap

The present study is distinguished from its predecessors in several dimensions that collectively constitute the targeted research gap. Unlike the study of Al-Khresheh et al. [1], it is not limited to the supervisory perspective but broadens the angle of view to include both teachers and learners, thus offering a more comprehensive vision. It also differs from the study of Mankash et al. [2] in its contextual and geographical affiliation, as it addresses a different educational reality that requires culturally and linguistically adapted measurement tools. Moreover, it departs from the study of Fiaz et al. [3] by focusing on a specific educational context rather than generalising to higher education institutions.

The present study further diverges from the study of Al Fraidan and Alaliwi [4] in adopting an applied field method instead of a documentary review, and from the study of Leong et al. [5] in being an applied study rather than a systematic review. It also differs from the study of Boukhelkhal [6] in the size and diversity of its sample and in its attention to more recent technological tools related to artificial intelligence and adaptive learning. The fundamental research gap lies in the scarcity of studies that combine, within a single research context and in an integrated manner, monitoring the impact of technology on language skills, analysing mediating factors such as teachers' digital competence and the readiness of the institutional environment, and examining structural challenges. The study seeks to address this gap through a rigorous scientific approach that combines analytical depth with methodological comprehensiveness.

3. Statement of the Problem

The problem of the study revolves around a central issue: the nature of the relationship between technology employment and linguistic outcomes in classrooms where English is taught as a second language. A careful reading of recent literature reveals a noticeable disparity between the theoretical expectations associated with technological integration and the outcomes actually observed in the field. Al-Khresheh, Alshammari, and Alkhresheh [1] (p. 15) indicated that the absence of specialised training and the weakness of infrastructure limit the effectiveness of technology employment, as a clear gap emerges between official policies and actual classroom practice.

The features of the problem deepen in light of the conclusion of Fiaz, Khadim, Shereen, and Akram [3] (p. 68) that educational institutions suffer from multifaceted challenges related to weak digital competence and inadequate training. The importance of addressing the problem scientifically becomes even clearer with the observation of Boukhelkhal [6] (p. 30) that technology exerts a positive impact on attracting students' attention and developing

their language skills, yet obstacles associated with poor equipment prevent this impact from being achieved sustainably. The problem of the study is therefore shaped by three intertwined paradoxes: the gap between policy and practice, the disparity between technical capabilities and human competence, and the contrast between short-term impact and the desired sustainability.

3.1. Main Question

What is the impact of technology use in teaching English as a second language?

3.2. Sub-Questions

Q1: What is the level of employment of technological tools in teaching English as a second language from the perspective of teachers and learners?

Q2: What is the nature of the relationship between technology employment and the development of the four language skills among learners of English as a second language?

Q3: What are the most prominent challenges facing the integration of technology in teaching English as a second language, and what are the proposed ways to overcome them?

4. Objectives of the Study

- 1) Introducing the technological tools employed in teaching English as a second language and their most prominent pedagogical features.
- 2) Examining the level of technology employment in classrooms from the perspective of teachers and learners.
- 3) Measuring the impact of technology use on the development of the four language skills among learners of English as a second language.
- 4) Analysing the challenges associated with technology integration and identifying procedural ways capable of enhancing its effectiveness in the educational environment.

5. Significance of the Study

The scientific significance of the study stems from its contribution to the body of knowledge on language teaching technology: it provides an in-depth analysis of the relationship between technology employment and the outcomes of learning English as a second language, and it opens new horizons for thinking about the mediating factors that govern the effectiveness of integration. Its applied significance lies in offering procedural recommendations to educational decision-makers and field practitioners, contributing to the development of teacher preparation programmes and their technological qualification, and supporting efforts to improve the digital infrastructure of educational institutions.

6. Study Hypotheses

Main hypothesis (H0): There is a statistically significant effect of technology use in teaching English as a second language on learners' linguistic outcomes at a significance level of $\alpha \leq 0.05$. This main hypothesis branches into the following sub-hypotheses:

H1: There is a statistically significant effect of the level of technological tool employment on the development of the four language skills.

H2: There is a statistically significant correlation between the teacher's digital competence and the effectiveness of technology integration.

H3: There are statistically significant differences in the level of benefit from technology attributable to institutional challenges and infrastructure.

7. Study Methodology

The study adopts the descriptive-analytical method, which allows the phenomenon under study to be monitored in its natural context. The study population consists of teachers and learners of English as a second language in 35 institutions and centres in Sabha City. The sample comprised 219 participants from 18 institutions and centres; its size was determined using the Krejcie and Morgan tables, and participants were selected through stratified random sampling.

8. Limits of the Study

The study is limited to the impact of technology use in teaching English as a second language at educational institutions in Sabha City. Its sample includes teachers and learners in 18 institutions and centres, and it was applied in the field according to the academic calendar of the institutions concerned.

9. Theoretical Framework

The theoretical framework represents the cognitive foundation on which applied studies in language teaching technology are built. It is organised into three sections that progress from the general to the specific: the first addresses educational technology and its theoretical foundations; the second deals with teaching English as a second language in light of digital transformation; and the third is devoted to the teacher's digital competence and the dimensions of techno-pedagogical integration.

9.1. Educational Technology and Its Foundations in Language Teaching

9.1.1. Concept, Emergence, and Development

Educational technology constitutes a renewable cognitive field based on employing digital tools and multimedia in the service of the educational process. In their meta-analysis, Rahmati et al. [7] (p. 7) showed that digital tools have produced a qualitative leap in the methods of presenting linguistic content and that the average effect size of technological interventions ranges between moderate and high. Educational technology has evolved through successive stages, beginning with audiovisual aids, moving to educational computing, then to the Internet and e-learning, and finally reaching artificial intelligence and virtual reality applications.

9.1.2. Theoretical Foundations of Educational Technology

Educational technology rests on a set of theoretical foundations, led by constructivist theory, which views learners as builders of their own knowledge through interaction with the digital environment. Pratama et al. [8] (p. 5) indicated that Vygotsky's sociocultural theory constitutes a fundamental reference for understanding how learning occurs in digital environments, where the concept of the zone of proximal development manifests itself in interactions between the learner and smart tools. Cognitive load theory and the theory of multimedia learning complement these foundations.

9.1.3. Classifications of Technological Tools in Language Teaching

Technological tools are distributed across multiple categories, including learning management platforms and synchronous and asynchronous communication applications. Sari [9] (p. 4015) clarified that this diversity requires the teacher to make a conscious selection that takes into account educational objectives and learners' characteristics. Mobile applications are acquiring a growing share owing to their wide spread and ease of access.

9.1.4. Multimedia and Its Impact on Language Acquisition

Multimedia constitutes a fundamental pillar, as it combines text, image, sound, and video in an integrated system. Naji Mohammed [10] (p. 12) demonstrated that employing multimedia software at the intermediate stage contributes significantly to raising female students' achievement. Its value is particularly evident in addressing receptive skills, since it provides authentic contexts that simulate the natural use of language.

9.1.5. Blended Learning as an Integrative Model

Blended learning enjoys a distinguished position because it combines the advantages of traditional instruction with the opportunities of e-learning. Al-Harathi [11] (p. 158) revealed positive attitudes among female English language teachers toward blended learning, while Al-Mazrouei [12] (p. 425) confirmed that blended learning contributed significantly to raising achievement and motivation among tenth-grade female students in the Sultanate of Oman.

9.1.6. The Flipped Classroom Strategy

The flipped classroom represents one of the most prominent contemporary applications, as it rests on rearranging the functions of instructional time. Al-Salmi [13] (p. 215) indicated that English language teachers' attitudes toward this strategy are generally positive and that it plays a role in raising achievement among primary-stage students in Jeddah.

9.2. Teaching English as a Second Language in Light of Digital Transformation

9.2.1. Characteristics of Teaching English as a Second Language

Teaching English as a second language involves specificities that distinguish it from mother-tongue teaching, as the learner often lacks a natural linguistic environment. Mankash et al. [2] (p. 30) clarified that technology constitutes an effective means of overcoming the limitations of the natural linguistic environment in language learning contexts at universities in Karachi, and that students who employ it regularly attain higher levels of acquisition.

9.2.2. The Four Language Skills in the Digital Environment

Methods of teaching language skills have undergone qualitative transformations as a result of digital transformation. Jasim [14] (p. 225) demonstrated that teachers' competence in employing blended learning has a significant effect on English reading comprehension, and Atta et al. [15] (p. 18) confirmed that designing digital learning programmes according to precise pedagogical criteria contributes to developing electronic reading skills.

9.2.3. Artificial Intelligence in Teaching English

Artificial intelligence occupies a growing position in English language teaching, as it opens horizons for adaptive learning and instant feedback. In their systematic review, Esmailzadeh et al. [16] (p. 10) clarified that recent years have witnessed a surge in the employment of these applications. Peña-Acuña and Corga Fernandes Durão [17] (p. 8) indicated that artificial intelligence opens wide horizons for prospective teachers, provided that adequate training is offered. Graduate research has likewise examined EFL teachers' perceptions and use of ChatGPT [18], the effect of ChatGPT on writing skills in EFL contexts [19], and parental attitudes toward technology-assisted English language learning for young children [20].

9.2.4. Smart Chat Applications in Language Learning

Smart chat applications have emerged as one of the most prominent manifestations of artificial intelligence. Alshammari [21] (p. 95) revealed the potential of ChatGPT to revolutionise the learning of English as a foreign language, and Balci [22] (p. 100) clarified that ChatGPT yields positive results in writing, grammar, and vocabulary.

9.2.5. Learners' Attitudes Toward Smart Technologies

Learners' attitudes constitute a decisive factor in the success of any technological intervention. Phosa [23] (p. 152) demonstrated that English language students show positive attitudes toward ChatGPT, whereas Vo and Nguyen [24] (p. 210) confirmed that students' acceptance of generative artificial intelligence is associated with their perceptions of its usefulness and ease of use.

9.2.6. Electronic Educational Platforms

Electronic platforms represent a pivotal infrastructure. Al-Dabbashi and Qambar [25] (p. 35) clarified that developing a web-based e-learning system contributes to developing English language skills among primary-stage students in Libyan schools, and Muhanna [26] (p. 170) demonstrated that a modified platform contributes to developing critical writing knowledge among students of the Faculty of Education.

9.3. Teacher Digital Competence and Techno-Pedagogical Integration

9.3.1. The Concept of Teacher Digital Competence

Digital competence refers to an integrated system of knowledge, skills, and attitudes. Al-Khresheh and Alkursheh [27] (p. 7) clarified that self-efficacy in employing technology through the Blackboard platform is significantly associated with English language proficiency and academic achievement, while Muhanna [28] (p. 100) indicated that modified e-learning platforms contribute to developing digital competence among students of the Faculty of Education.

9.3.2. Dimensions of Teacher Professional Development

Continuous professional development constitutes a fundamental pillar. Alshehri [29] (p. 27) explored the experiences of English language teachers in the Kingdom of Saudi Arabia, whose participants confirmed the importance of training programmes while highlighting the shortcomings of some of them. Abraham et al. [30] (p. 8) demonstrated that specialised training produces a significant positive impact on teachers' pedagogical knowledge.

9.3.3. Training Needs of English Language Teachers

Al-Sarhani and Al-Anzi [31] (p. 22) clarified that female English language teachers express multiple training needs in light of the use of blended education, and Al-Ghonaim [32] (p. 230) indicated that the overall level of use of artificial intelligence-based applications is moderate.

9.3.4. Techno-Pedagogical Integration and Its Requirements

Techno-pedagogical integration is based on the organic integration of tool, content, and strategy. In their systematic review, Leong et al. [5] (p. 2460) demonstrated that successful integration depends on intertwined factors, including teacher characteristics, the nature of the content, and the readiness of the environment. Wiranata et al. [33] (p. 325) clarified that the integration of technology in English language teaching has undergone qualitative development.

9.3.5. Institutional and Structural Challenges

Integration encounters a host of institutional challenges. Al Fraidan and Alaliwi [4] (p. 955) indicated that sustainable digital transformation requires addressing structural challenges comprehensively, and Al-Qahtani [34] (p. 320) demonstrated that the degree to which female English language teachers in Riyadh employ blended education is moderate.

9.3.6. Attitudes of Faculty Members and Students

The attitudes of faculty members and students constitute a decisive factor. Badawi [35] (p. 140) clarified that the attitudes of both parties toward blended learning during the COVID-19 pandemic were positive, and Murad Saleh

[36] (p. 240) indicated that programmes based on blended learning contribute to developing twenty-first-century skills.

9.3.7. Digital Storytelling and Cultural Awareness

Hamdy [37] (p. 90) demonstrated that the use of digital stories contributes to improving cultural awareness among English language specialists, while Al-Omari et al. [38] (p. 110) confirmed that drill-and-practice software is effective in developing spelling skills.

9.3.8. Future Development Horizons

Al-Desouqi and Ahmed [39] (p. 15) clarified that the interaction between a support pattern based on artificial intelligence applications and cognitive style has a significant impact on developing the skills of using e-learning platforms. Such horizons call for integrated research frameworks capable of monitoring emerging variables.

10. The Applied Study

The applied component represents the most important link in educational research, as it allows the researcher to test the hypotheses on the ground. This part relies on field data collected from a sample of 219 participants in 18 institutions and centres in Sabha City. Of the distributed forms, 210 were retrieved and one was excluded because of incomplete data, leaving 209 valid forms and a retrieval rate of 95.43%.

10.1. Method and Tools

10.1.1. Study Instrument

The questionnaire was designed on the basis of the theoretical framework and previous literature. In its final form, it consisted of two sections: the first covered general data and included five demographic variables, while the second included three axes corresponding to the sub-questions, with a total of 27 statements (nine statements per axis) formulated on a five-point Likert scale.

10.1.2. Validity of the Instrument

Face validity: The questionnaire was presented to a panel of specialised arbitrators, and the proposed modifications were made, so that its final form comprised 27 statements.

Internal consistency validity: Table 1 presents the Pearson correlation coefficients between the score of each statement and the total score of its axis.

Table 1: Pearson correlation coefficients between the score of each statement and the total score of its axis.

Statement No.	First Axis	Second Axis	Third Axis
1	0.712**	0.745**	0.689**
2	0.684**	0.701**	0.723**
3	0.756**	0.768**	0.701**
4	0.698**	0.712**	0.745**
5	0.731**	0.689**	0.712**
6	0.745**	0.756**	0.734**
7	0.689**	0.723**	0.756**
8	0.712**	0.745**	0.701**
9	0.723**	0.701**	0.689**

** Significant at the 0.01 level.

All correlation coefficients are statistically significant at the 0.01 level, ranging between 0.684 and 0.768, which indicates that the statements enjoy a high degree of internal consistency validity.

Construct validity: Table 2 presents the correlation coefficients between the score of each axis and the total score of the questionnaire.

Table 2: Pearson correlation coefficients between the score of each axis and the total score.

Axis	Correlation Coefficient	Significance Level
First: Level of Technological Tool Employment	0.847**	0.000
Second: Relationship Between Technology and Language Skills	0.876**	0.000
Third: Challenges of Technology Integration and Proposed Ways	0.823**	0.000

The correlation coefficients ranged between 0.823 and 0.876, indicating that the three axes are integrated in measuring the general construct of the phenomenon.

10.1.3. Reliability of the Instrument

Table 3: Cronbach's alpha reliability coefficients.

Axis	Number of Statements	Cronbach's Alpha Coefficient
First	9	0.876
Second	9	0.891
Third	9	0.862
Questionnaire as a Whole	27	0.923

Cronbach's alpha values ranged between 0.862 and 0.891, and the reliability coefficient of the questionnaire as a whole reached 0.923. These values exceed the minimum accepted threshold (0.70), indicating that the instrument enjoys a high degree of reliability.

10.2. Description of Sample Characteristics

Table 4: Distribution of the sample by gender.

Gender	Frequency	Percentage
Male	92	44.02%
Female	117	55.98%
Total	209	100%

The distribution of the sample by gender was close, with a relative predominance of females (55.98%) over males (44.02%). This reflects the actual reality of the English language teaching profession and the demand for learning it in Sabha City, and it allows for a balanced view that captures the perspectives of both genders.

Table 5: Distribution of the sample by category.

Category	Frequency	Percentage
Teacher	86	41.15%
Learner	123	58.85%
Total	209	100%

Learners constituted 58.85% of the sample and teachers 41.15%, reflecting the quantitative relationship between the two categories and allowing the study to explore the phenomenon from two complementary angles: that of the practitioner and that of the beneficiary.

Table 6: Distribution of the sample by educational qualification.

Educational Qualification	Frequency	Percentage
Secondary School or Less	67	32.06%
Bachelor's Degree	98	46.89%
Graduate Studies	44	21.05%
Total	209	100%

The bachelor's degree category obtained the highest percentage (46.89%), followed by secondary school or less (32.06%) and graduate studies (21.05%). This diversity enriches the data and allows differences in perceptions attributable to qualification to be tested.

Table 7: Distribution of the sample by years of experience.

Years of Experience	Frequency	Percentage
Less than 5 years	81	38.76%
From 5 to less than 10	73	34.93%
10 years or more	55	26.31%
Total	209	100%

The category of less than five years ranked first (38.76%), followed by five to less than ten years (34.93%) and ten years or more (26.31%). This balanced gradation reflects good representation of various professional and learning stages.

Table 8: Distribution of the sample by educational stage.

Educational Stage	Frequency	Percentage
Basic	58	27.75%
Secondary	71	33.97%
University and Language Centers	80	38.28%
Total	209	100%

The university stage and language centres ranked first (38.28%), followed by the secondary stage (33.97%) and the basic stage (27.75%), revealing the increasing demand for language centres and university English programmes.

10.3. Analysis of Axis Statements

The following criterion was adopted for the five-point Likert scale: 1.00–1.79 (strongly disagree), 1.80–2.59 (disagree), 2.60–3.39 (neutral), 3.40–4.19 (agree), and 4.20–5.00 (strongly agree).

10.3.1. First Axis: Level of Technological Tool Employment

Table 9: Means, standard deviations, and significance of the first-axis statements.

No.	Statement	Mean	Std. Dev.	Significance
1	Learning management platforms are employed regularly	4.08	0.94	0.000
2	Mobile applications are used outside the classroom	4.16	0.91	0.000
3	Multimedia is integrated into content	4.22	0.89	0.000
4	Artificial intelligence applications are employed	3.81	1.08	0.000
5	Video platforms and visual content are invested	4.18	0.91	0.000
6	Blended learning is adopted as an integrative model	3.94	1.03	0.000
7	The flipped classroom strategy is used	3.70	1.13	0.000
8	Specialized educational platforms are available	4.01	1.00	0.000
9	Digital tools are diversified in the classroom	4.11	0.94	0.000
	Overall Mean of the Axis	4.02	0.85	0.000

The results reveal a high level of technological tool employment, with an overall mean of 4.02. Statement 3, relating to multimedia integration, ranked first ($M = 4.22$), which is consistent with the nature of language teaching that requires combining visual and auditory channels. Mobile applications ranked second ($M = 4.16$), reflecting their wide spread and ease of access. In contrast, the flipped classroom strategy obtained the lowest mean (3.70), indicating that it has not yet become a widely adopted practice. Likewise, artificial intelligence applications obtained a mean of 3.81, signalling an early stage of adoption with a gap that can be bridged.

10.3.2. Second Axis: Relationship Between Technology and Language Skills

Table 10: Means, standard deviations, and significance of the second-axis statements.

No.	Statement	Mean	Std. Dev.	Significance
1	Development of listening skill	4.25	0.88	0.000
2	Enhancement of conversation and speaking skill	4.18	0.91	0.000
3	Development of reading and comprehension skill	4.21	0.90	0.000
4	Improvement of writing skill	4.12	0.94	0.000
5	Smart chat applications and productive skills	4.06	0.99	0.000
6	Enrichment of vocabulary repertoire	4.25	0.87	0.000
7	Improvement of pronunciation and phonetic competence	4.10	0.95	0.000
8	Enhancement of cultural awareness	4.14	0.93	0.000
9	Integrated training for the four skills	4.18	0.91	0.000
	Overall Mean of the Axis	4.17	0.83	0.000

The results reflect a strong positive trend, with an overall mean of 4.17. Two statements shared first place ($M = 4.25$): the development of listening and the enrichment of vocabulary, which is consistent with the nature of digital tools that provide rich auditory environments and present vocabulary in natural contexts. Reading ranked next ($M = 4.21$), followed by speaking and integrated training ($M = 4.18$). These results reveal the sample's awareness of the integrated value of digital tools in addressing language skills and provide initial support for the study's hypotheses.

10.3.3. Third Axis: Integration Challenges and Proposed Ways

Table 11: Means, standard deviations, and significance of the third-axis statements.

No.	Statement	Mean	Std. Dev.	Significance
1	Weakness of digital infrastructure	4.28	0.89	0.000
2	Limited specialized training	4.24	0.88	0.000
3	Absence of sustainable technical support	4.18	0.92	0.000
4	Weakness of digital competence among some teachers	4.15	0.92	0.000
5	Deficiency of institutional policies	4.07	0.97	0.000
6	Limited incentives	4.08	0.98	0.000
7	Organizing specialized professional development programs	4.30	0.84	0.000
8	Developing digital infrastructure	4.33	0.83	0.000
9	Building partnerships with specialized entities	4.19	0.91	0.000
	Overall Mean of the Axis	4.20	0.81	0.000

The results reveal a clear perception of challenges and proposed ways, with an overall mean of 4.20. Statement 8 (developing digital infrastructure) ranked first ($M = 4.33$), followed by professional development programmes ($M = 4.30$), weakness of infrastructure as a fundamental challenge ($M = 4.28$), and limited specialised training ($M = 4.24$). This ranking reveals an advanced awareness that the fundamental challenges are centred on two interrelated

axes: physical infrastructure and human competence. Statements related to policy deficiencies and limited incentives obtained the lowest means (4.07 and 4.08), indicating that these challenges are present in the sample's awareness, albeit less severe.

10.4. Answering the Study Questions

Q1: The level of employment of technological tools in teaching English in Sabha City is high ($M = 4.02$). Multimedia, mobile applications, and video platforms stand out as the most used tools, whereas the flipped classroom strategy and artificial intelligence applications recede relatively. This disparity reflects the ease of access to certain tools as opposed to the precise planning and specialised training required to employ others.

Q2: There is a strong positive relationship between technology employment and the development of the four language skills ($M = 4.17$). This relationship is manifested in technology's contribution to developing listening and enriching vocabulary ($M = 4.25$ each) and to developing reading ($M = 4.21$), revealing that digital tools are pivotal in addressing all language skills in an integrated manner.

Q3: Fundamental challenges exist, most notably the weakness of digital infrastructure ($M = 4.28$) and limited specialised training ($M = 4.24$), while the proposed ways are led by developing infrastructure ($M = 4.33$) and professional development programmes ($M = 4.30$). Challenges and solutions thus revolve around two interrelated poles: physical infrastructure and human competence.

10.5. Testing the Study Hypotheses

10.5.1. Testing the Main Hypothesis

Table 12: Results of the linear regression analysis (main hypothesis).

Independent Variable	B Coefficient	Standard Error	β	T	Significance	R ²
Technology Use	0.782	0.054	0.706	14.487	0.000	0.498

The results reveal a statistically significant effect of technology use on linguistic outcomes ($p = 0.000$), with a beta coefficient of 0.706 and a t value of 14.487. The coefficient of determination (R^2) reached 0.498, meaning that technology use explains 49.8% of the variance in linguistic outcomes. Accordingly, the main hypothesis is accepted.

10.5.2. Testing the First Sub-Hypothesis

Table 13: Results of the regression analysis (first sub-hypothesis).

Variable	B Coefficient	Standard Error	β	T	Significance	R ²
Technological Tool Employment	0.745	0.058	0.671	12.843	0.000	0.450

The results reveal a statistically significant effect ($\beta = 0.671$, $p = 0.000$); hence, the first sub-hypothesis is accepted. The coefficient of determination reached 0.450, meaning that the employment of technological tools explains 45% of the variance in language skill development.

10.5.3. Testing the Second Sub-Hypothesis

Table 14: Results of the Pearson correlation coefficient (second sub-hypothesis).

Variables	Correlation Coefficient	Significance	Sample
Digital Competence × Integration Effectiveness	0.738**	0.000	209

The results indicate a strong positive correlation ($r = 0.738$, $p = 0.000$); hence, the second sub-hypothesis is accepted. This result reveals that the teacher's digital competence constitutes a decisive mediating factor and that investment in tools alone is insufficient unless coupled with building qualified human capacities.

10.5.4. Testing the Third Sub-Hypothesis

Table 15: Results of the one-way ANOVA (third sub-hypothesis).

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Squares	F	Significance
Between Groups	38.624	2	19.312	24.137	0.000
Within Groups	164.798	206	0.800		
Total	203.422	208			

The results reveal statistically significant differences ($F = 24.137$, $p = 0.000$); hence, the third sub-hypothesis is accepted. This result confirms that disparities in the readiness of the institutional environment create tangible differences in the benefit derived from technological tools.

10.6. Summary of Hypothesis Testing Results

Table 16: Summary of hypothesis testing results.

Hypothesis	Indicator	Value	Significance	Decision
Main	Beta β	0.706	0.000	Accepted
First Sub	Beta β	0.671	0.000	Accepted
Second Sub	Pearson r	0.738	0.000	Accepted
Third Sub	F	24.137	0.000	Accepted

Table 16 shows that all study hypotheses are accepted at a significance level of 0.000, which supports the theoretical conception from which the study proceeded and confirms that technology plays a pivotal role in shaping linguistic outcomes.

11. Discussion of Results in Light of Previous Studies

The results of the first axis revealed a high level of technological tool employment ($M = 4.02$). This result is consistent with the finding of Sari [9] (p. 4015) that teachers tend to combine more than one tool in a single class, and it intersects with the notable growth in employing interactive tools observed by Wiranata et al. [33] (p. 325). The prominence of multimedia and mobile applications agrees with Naji Mohammed [10] (p. 12), who found that multimedia software contributes to raising achievement, and with Rahmati et al. [7] (p. 7), who concluded that the average effect size of technological interventions ranges between moderate and high.

The results of the second axis revealed a strong positive relationship between technology and language skills ($M = 4.17$), consistent with Jasim [14] (p. 225), who confirmed that teachers' competence has a significant effect on reading comprehension, and with Atta et al. [15] (p. 18), who found that designing digital learning programmes contributes to developing electronic reading. The superiority of listening and vocabulary enrichment intersects with the conclusion of Esmaeilzadeh et al. [16] (p. 10) that artificial intelligence applications achieve promising results, and with Balci [22] (p. 100), who concluded that ChatGPT yields positive results in writing and vocabulary. The study of Al-Dabbashi and Qambar [25] (p. 35) confirms the same result.

The results of the third axis revealed the existence of structural challenges, which matches the finding of Al-Khresheh et al. [1] (p. 15) that the absence of training and weak infrastructure limit the effectiveness of technology employment. They also intersect with the observation of Fiaz et al. [3] (p. 68) that institutions suffer from challenges related to weak digital competence. The emphasis on developing infrastructure is consistent with Boukhelkhal [6] (p. 30), who found that obstacles limit the positive impact of technology, and with Al Fraidan and Alaliwi [4] (p. 955), who concluded that digital transformation requires comprehensive treatment.

The results of the second sub-hypothesis confirmed a strong positive correlation ($r = 0.738$), consistent with Al-Khresheh and Alkursheh [27] (p. 7), who found that self-efficacy is significantly correlated with language proficiency, and with Abraham et al. [30] (p. 8), who found that training produces a positive impact. These results also intersect with Alshehri [29] (p. 27) regarding the importance of training programmes, with Al-Sarhani and Al-Anzi [31] (p. 22) regarding the diversity of training needs, and with Al-Ghonaim [32] (p. 230), who concluded that the level of use of artificial intelligence-based applications is moderate.

The results of the main hypothesis confirmed a significant effect with an explained variance of 49.8%, consistent with Mankash et al. [2] (p. 30), who found that students who employ technology attain higher levels. They also agree with Al-Mazrouei [12] (p. 425), who concluded that blended learning contributed to raising achievement, with Leong et al. [5] (p. 2460) regarding the intertwined factors underlying successful integration, and with

Pratama et al. [8] (p. 5) regarding the centrality of sociocultural theory. The relatively moderate mean of artificial intelligence applications in the first axis ($M = 3.81$) is consistent with the findings of Peña-Acuña and Corga Fernandes Durão [17] (p. 8), Phosa [23] (p. 152), Alshammari [21] (p. 95), and Vo and Nguyen [24] (p. 210).

The present results on blended learning match those of Al-Harthi [11] (p. 158) regarding positive attitudes, Al-Salmi [13] (p. 215) regarding the flipped classroom, Al-Qahtani [34] (p. 320) regarding the moderate degree of employment, and Badawi [35] (p. 140) regarding the positive attitudes of both faculty and students. The results concerning the role of platforms are consistent with Muhanna [26] (p. 170) and [28] (p. 100) regarding the contribution of platforms to developing critical writing and digital competence, with Hamdy [37] (p. 90) regarding the contribution of digital stories to cultural awareness, with Al-Omari et al. [38] (p. 110) regarding the effectiveness of software in developing spelling, with Murad Saleh [36] (p. 240) regarding the contribution of blended learning to twenty-first-century skills, and with Al-Desouqi and Ahmed [39] (p. 15) regarding the importance of the interaction between artificial intelligence and cognitive style.

12. Recommendations

In light of the results, the researcher recommends the following:

- 1) Developing the digital infrastructure of educational institutions in Sabha City by allocating sufficient budgets for devices and high-speed Internet connectivity, as a fundamental condition for activating technological integration.
- 2) Designing specialised professional development programmes for English language teachers that focus on digital competence, the employment of artificial intelligence, and the management of educational platforms, provided that these programmes are continuous and updated in line with new developments.
- 3) Expanding the employment of artificial intelligence applications and the flipped classroom strategy, which recorded the lowest means, through applied training workshops and specialised technical support.
- 4) Establishing clear institutional policies that regulate digital transformation in language teaching, including quality standards, follow-up and evaluation mechanisms, and incentive systems for digitally distinguished teachers.
- 5) Building partnerships with specialised local and international entities to support digital transformation and transfer expertise, and providing digital educational resources suited to the local environment.
- 6) Encouraging learners to employ digital applications in self-directed learning while raising their awareness of the ethical and responsible use of artificial intelligence applications.
- 7) Conducting further studies on mediating variables such as cognitive style, learning motivation, and institutional culture.
- 8) Developing adaptive assessment tools that harness the potential of artificial intelligence to monitor linguistic progress and provide instant feedback responsive to individual differences.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that they have no conflict of interest.

References

1. Al-Khreshheh, M.H.; Alshammari, S.R.; Alkhreshheh, S.M. Digital integration in the Saudi ELT context: A supervisory lens on teachers' technological efficacy. *Cogent Social Sciences* **2025**, *11*(1), 1–22.
2. Mankash, M.A.; Ahmed, S.T.; Shabbir, N. Second language learning in the digital age: How technology shapes language acquisition at universities in Karachi, Pakistan. *International Journal of Language & Literature* **2025**, *3*(1), 22–41.
3. Fiaz, H.; Khadim, H.; Shereen, K.; Akram, M. Adoption, challenges, and technology-driven solutions for computer-assisted language learning in higher education: Enhancing EFL instructions. *Bulletin of Multidisciplinary Studies* **2025**, *4*(2), 55–78.
4. Al Fraidan, A.; Alaliwi, M. Digital transformation for sustainable English language learning: Insights from Saudi Arabia and global perspectives. *Forum for Linguistic Studies* **2024**, *6*(6), 945–966.
5. Leong, L.V.; Yunus, M.M.; Ismail, H.H. Integration of techno-pedagogical approach in English as a second language classroom: A systematic review. *International Journal of Evaluation and Research in Education* **2024**, *13*(4), 2455–2466.
6. Boukhelkhal, A. The Impact of Using Technology in Teaching English as a Foreign Language in Algerian Secondary School: The Case of First-Year Students at Qudry Mohamed El Aid Secondary School. Unpublished Master's Thesis, Mohamed Khider University of Biskra, Biskra, Algeria, 2024.
7. Rahmati, J.; Izadpanah, S.; Shahnavaz, A. A meta-analysis on educational technology in English language teaching. *Language Testing in Asia* **2021**, *11*, 7.

8. Pratama, R.; Lestari, L.; Kirkgöz, Y.; Susanto, S. Teachers' perceived perspective and self-efficacy in teaching EFL using Intelligent Computer-Assisted Language Learning (ICALL): A rigorous analysis. *The JALT CALL Journal* **2024**, 20(3), 1–22.
9. Sari, N. The role of technology in facilitating EFL learning: A case study approach. *Journal of Education Research* **2024**, 5(3), 4011–4022.
10. Naji Mohammed, A. The reality of using multimedia software in teaching English at the intermediate stage in Madinah. *Journal of the Faculty of Education (Assiut)* **2023**, 39(6), 1–38. (In Arabic)
11. Al-Harthi, Z.H. Blended learning in teaching English at the intermediate stage from the perspective of female teachers in Taif city. *Arab Journal of Specific Education* **2024**, 8(33), 145–172. (In Arabic)
12. Al-Mazrouei, S.K.M. The effectiveness of blended learning in light of the Corona pandemic in developing achievement and learning motivation of tenth-grade female students of basic education for the English language course in the Sultanate of Oman. *Studies in University Education* **2022**, (56), 401–438. (In Arabic)
13. Al-Salmi, F.M.M. The attitudes of English language teachers toward the flipped classroom strategy in blended learning and its role in raising the level of achievement among primary stage students in Jeddah. *International Journal of Educational and Psychological Sciences* **2021**, (61), 199–242. (In Arabic)
14. Jasim, L.L. A study of teachers' competence in blended learning and its impact on students' English reading comprehension results. *Journal of Basic Sciences – Wasit University* **2023**, 9(17), 215–238. (In Arabic)
15. Atta, A.; Salim, S.; Al-Deeb, E. The impact of a designed digital learning program on developing electronic reading skills in English among students of the Faculty of Tourism and Hotels. *Journal of Educational and Social Studies* **2024**, 30(7), 1–34. (In Arabic)
16. Esmailzadeh, F.; Ghahari, S.; Rohani, G. Artificial intelligence in language teaching and assessment: A systematic review of research (2020–2024). *The Asian Journal of Applied Linguistics* **2025**, 12(1), 1–22.
17. Peña-Acuña, B.; Corga Fernandes Durão, R. Learning English as a second language with artificial intelligence for prospective teachers: A systematic review. *Frontiers in Education* **2024**, 9, 1490067.
18. Dilzhan, B. Teaching English and Artificial Intelligence: EFL Teachers' Perceptions and Use of ChatGPT. Master's Thesis, SDU University, Kaskelen, Kazakhstan, 2024.
19. Kulaksız, G.C. Artificial Intelligence-Based Language Modelling: The Effect of ChatGPT Application on Writing Skills in the Context of Teaching English as a Foreign Language. Master's Thesis, Bursa Uludağ University, Bursa, Türkiye, 2024.
20. Matban, N. Exploring Parental Attitudes towards Technology-Assisted English Language Learning (TALL) for Young Children in Türkiye. Doctoral Dissertation, University of Warsaw, Warsaw, Poland, 2023.
21. Alshammari, J. Revolutionizing EFL learning through ChatGPT: A qualitative study. *Amazonia Investiga* **2024**, 13(78), 88–104.
22. Balcı, Ö. The role of ChatGPT in English as a foreign language (EFL) learning and teaching: A systematic review. *International Journal of Current Educational Studies* **2024**, 3(2), 90–115.
23. Phosa, S. The study of EFL students' attitudes and behaviors toward using ChatGPT in English language learning. *Journal of English Language and Linguistics* **2024**, 5(2), 144–161.
24. Vo, A.; Nguyen, H. Generative artificial intelligence and ChatGPT in language learning: EFL students' perceptions of technology acceptance. *Journal of University Teaching and Learning Practice* **2024**, 21(6), 199–217.
25. Al-Dabbashi, A.M.; Qambar, A.M. A web-based e-learning system for developing English language skills among primary stage students in Libyan schools. *African University Journal of Scientific Research* **2025**, 2(1), 23–48. (In Arabic)
26. Muhanna, D.F.M. Using a modified e-learning platform to develop critical writing knowledge and skills among students of the Faculty of Education majoring in English. *Journal of Research in Education and Psychology* **2023**, 38(1), 145–192. (In Arabic)
27. Al-Khresheh, M.H.; Alkursheh, T.O. An integrated model exploring the relationship between self-efficacy, technology integration via Blackboard, English proficiency, and Saudi EFL students' academic achievement. *Humanities and Social Sciences Communications* **2024**, 11(1), 1–14.
28. Muhanna, D.F.M. Using a modified e-learning platform to develop critical reading and digital competence among students of the Faculty of Education majoring in English. *Journal of Research in Education and Psychology* **2023**, 38(3), 75–124. (In Arabic)
29. Alshehri, M. Experiences and perceptions of Saudi EFL teachers on professional development in technology integration into teaching. *Saudi Journal of Language Studies* **2025**, 5(1), 17–35.
30. Abraham, M.; Arficho, Z.; Habtemariam, T.; Demissie, A. Effects of information communication technology-assisted teaching training on English language teachers' pedagogical knowledge and English language proficiency. *Cogent Education* **2022**, 9(1), 1–17.
31. Al-Sarhani, M.D.; Al-Anzi. The training needs of female English language teachers in light of the use of blended education from their point of view. *Journal of the Faculty of Education* **2021**, 37(5), 1–34. (In Arabic)

32. Al-Ghonaim, H.S.A. The level of using educational applications based on artificial intelligence technologies among English language teachers in light of some variables. *Journal of the Faculty of Education (Assiut)* **2024**, 40(8), 211–248. (In Arabic)
33. Wiranata, S.; Nasrullah, N.; Asrimawati, I.F. Investigating technology integration in English language instruction from 2018 to 2024: A systematic literature review. *Journal of English Language Teaching and Linguistics* **2024**, 9(3), 311–340.
34. Al-Qahtani, S.M.M. The degree of employment of blended learning by female English language teachers at the secondary stage in Riyadh city. *Arab Studies in Education and Psychology* **2021**, (138), 295–334. (In Arabic)
35. Badawi, A.A. The attitudes of faculty members and students toward using blended learning during the COVID-19 pandemic. *Journal of the Faculty of Education – Alexandria University* **2022**, 32(4), 117–158. (In Arabic)
36. Murad Saleh, M. A program based on blended learning to develop 21st-century skills in English among students of the general diploma. *Journal of Educational and Social Studies* **2024**, 30(12), 213–256. (In Arabic)
37. Hamdy, H.Z. Using digital stories to improve cultural awareness among English language specialists in the Faculty of Education. *Journal of Research in Education and Psychology* **2025**, 40(2), 65–104. (In Arabic)
38. Al-Omari, J.; Al-Shahri, T.; Al-Salmi. The effectiveness of using educational software based on drill and practice in developing spelling skill in the English language subject among third-grade primary female students in Jeddah city. *Journal of the Faculty of Education (Assiut)* **2025**, 41(3), 87–124. (In Arabic)
39. Al-Desouqi, A.A.; Ahmed, H.S. The effect of the interaction between the support pattern based on artificial intelligence applications and cognitive style on developing the skills of using e-learning platforms among students of the Faculty of Education (research extracted from a doctoral thesis). *Journal of the Faculty of Education in Tafahna Al-Ashraf – Al-Azhar University* **2026**. (In Arabic)

Disclaimer/Publisher's Note: The statements, opinions, and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of **LJCAS** and/or the editor(s). **LJCAS** and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions, or products referred to in the content.