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Effects of AI-based educational applications on EFL students' speaking and writing performance: A pre-experimental study

Efectos de las aplicaciones educativas basadas en IA en el desempeño oral y escrito de estudiantes de inglés como lengua extranjera: Un estudio preexperimental

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ABSTRACT

In the Ecuadorian educational context, particularly at the secondary school level, traditional methodologies centered on memorization and grammatical instruction of the English language still predominate, which has constrained the development of communicative competencies, especially oral and written expression. In response to this issue, the study was conducted in a school setting where low levels of performance were observed in pronunciation, fluency, spelling, and punctuation, as well as a limited use of artificial intelligence–based educational applications. The aim of the study was to determine the impact of implementing practical exercises supported by ELSA Speak and Writing & Improve on the enhancement of integrated oral and written production skills in secondary school students. The research adopted a quantitative approach with a pre-experimental pretest–posttest design. A validated structured questionnaire was administered to a sample of 60 students. The data were recoded into comparative categories and converted into proportions for inferential statistical analysis. Subsequently, a Shapiro–Wilk normality test and a paired-samples t-test were conducted using SPSS software. The results demonstrated a significant improvement across all assessed skills following the didactic intervention. Statistical analysis confirmed significant differences between the pretest and posttest ($p < 0.05$). The findings indicated that the pedagogically contextualized integration of tools such as ELSA Speak and Writing & Improve promotes more active, autonomous, and meaningful learning. Nevertheless, the study could be strengthened by including a control group and extending the intervention period, thereby opening the possibility for future research.

Keywords: artificial intelligence, english language learning, speaking skills, technological integration, writing skills

RESUMEN

En el contexto educativo ecuatoriano, particularmente en el nivel de educación secundaria, aún predominan metodologías tradicionales centradas en la memorización y en la instrucción gramatical del idioma inglés, lo que ha limitado el desarrollo de las competencias comunicativas, especialmente la expresión oral y escrita. En respuesta a esta problemática, la investigación se llevó a cabo en un entorno escolar donde se evidenciaban bajos niveles de desempeño en pronunciación, fluidez, ortografía y uso de signos de puntuación, así como un uso limitado de aplicaciones educativas basadas en inteligencia artificial. El objetivo del estudio fue determinar el impacto de la implementación de ejercicios prácticos apoyados en ELSA Speak y Writing & Improve en el fortalecimiento de las habilidades integradas de producción oral y escrita en estudiantes de secundaria. La investigación adoptó un enfoque cuantitativo con un diseño preexperimental de pretest y postest. Se aplicó un cuestionario estructurado validado a una muestra de 60 estudiantes. Los datos fueron recodificados en categorías comparativas y transformados en proporciones para su análisis estadístico inferencial. Posteriormente, se realizaron la prueba de normalidad de Shapiro-Wilk y la prueba t para muestras relacionadas mediante el software SPSS. Los resultados evidenciaron una mejora significativa en todas las habilidades evaluadas tras la intervención didáctica. El análisis estadístico confirmó diferencias significativas entre el pretest y el postest ($p < 0,05$). Los resultados indicaron que la integración pedagógicamente contextualizada de herramientas como ELSA Speak y Writing & Improve promueve un aprendizaje más activo, autónomo y significativo. No obstante, el estudio podría fortalecerse mediante la inclusión de un grupo de control y la ampliación del periodo de intervención, abriendo la posibilidad a futuras investigaciones.

Palabras clave: inteligencia artificial, aprendizaje del idioma inglés, habilidades de expresión oral, integración tecnológica, habilidades de escritura

INTRODUCTION

In 21st-century education, the use of AI-based applications has become a key approach for enhancing English language teaching. According to Li (2022), these tools provide immediate feedback, personalized tasks and dynamic practice, enabling students to take an active role in the learning process. According to Huang et al. (2022), AI-based applications are transforming language teaching by facilitating adaptive learning processes in speaking and writing, demonstrating that these tools can complement the work of teachers when integrated effectively into pedagogical contexts. Schmidt and Strassner (2022), on the other hand, demonstrated that AI-driven language learning tools promote learner autonomy and self-regulated learning.

Similarly, Guzmán and Esquivel (2025), in their study on AI in EFL teaching, found that these tools positively impact on the integrated development of speaking and writing skills, particularly in contexts that promote consistent and contextualized practice. According to Ayala and Alvarado (2023), these tools offer a flexible approach that adapts to each student's pace and learning style, enhancing communicative skills. Kolegova and Levina (2024), on the other hand, demonstrated that AI-based teaching resources enable personalized learning, generate interactive content and the promotion of communicative skills practice in simulated contexts. Fitria (2021), for her part, analyzed the role of AI in language learning within the English Language Teaching framework and concluded that artificial intelligence-based technologies generate more dynamic learning environments, support the simultaneous development of speaking and writing skills and improve student motivation.

Developing speaking and writing skills requires guidance, continuous feedback, and interactive learning environments that lead to meaningful learning; that is, learning that is applicable in everyday contexts (Mayorga and Tibán, 2024). However, as Syuhra et al. (2025) note, many educational institutions still rely on grammar-based and memorization-focused approaches, which hinder effective English language learning. Similarly, Armendáriz et al. (2024) demonstrated that learning centred solely on grammatical structures limits fluency and meaningful communication. Therefore, integrating Artificial Intelligence tools helps to overcome these barriers by providing contextualized practice that strengthens communicative skills in a more natural and functional manner.

The incorporation of Artificial Intelligence applications such as ELSA Speak, Duolingo and ChatGPT has transformed English language teaching through immediate feedback, content personalization and autonomous practice. The research conducted by Anggraini (2022) showed that ELSA Speak notably improved students' pronunciation. Xiaofan and Annamalai (2025) indicate that AI-based adaptive platforms promote motivation and performance in writing and speaking. Furthermore, Al-khresheh (2024) demonstrated that ChatGPT contributes to increasing learner autonomy and communicative fluency. Along these lines, Sari (2023) highlights that the

inclusion of AI reduced dependence on rote learning and enhanced meaningful interaction in the English language.

Alqaed (2024), on the other hand, demonstrated that the use of applications such as ChatGPT in English as a Foreign Language teaching contexts has produced significant improvements in error correction and learner autonomy. Marghany (2023) concluded that the integration of AI applications for individualized feedback increased oral fluency and accuracy in non-native speaking students. Sehlaoui (2024), in contrast, established that the use of adaptive AI platforms in English language learning promoted greater motivation, engagement and progress in writing. López et al. (2025) confirmed that AI-driven learning environments with voice assistants enhanced communicative competence through simulated dialogue and immediate correction.

The simultaneous development of skills such as speaking, writing, reading and listening facilitates more comprehensive English language learning, where each skill reinforces the others. In this regard, Hipo et al. (2022) found that the Integrated Skills Approach increased students' communicative competence. Mahapatra (2024) demonstrated that project-based activities integrating listening and speaking increased student motivation and participation. Murillo et al. (2021), in their analysis of technology-based learning environments, indicated that the integration of different skills through technology reinforced authentic interaction in English. Similarly, Sapan and Uzun (2024) demonstrated that the incorporation of ChatGPT in English language teaching significantly improved the writing and vocabulary of English as a Foreign Language learners.

The inclusion of artificial intelligence-based educational applications facilitates a more personalised and adaptive learning experience, which promotes the simultaneous development of speaking and writing skills in English. According to Sanabria et al. (2023), Artificial Intelligence tools allow for immediate feedback and autonomous practice, which notably improves performance in productive skills. Chicaiza et al. (2025) have found that the consistent use of AI platforms is associated with progress in speaking and writing skills among English language students. This demonstrates that AI technologies increase student motivation and lead to better outcomes in English language learning.

From this analyzed context, platforms such as ELSA Speak and Writing & Improve offer learning opportunities to overcome the limitations presented by traditional English language teaching methods that are still being implemented in classrooms within the Ecuadorian educational system. Educational inclusion implies not only access, but also the implementation of strategies that eliminate barriers and guarantee quality education, as supported by the Constitution and the Ley Orgánica de Educación Intercultural (Román et al., 2025).

Background to the Problem

The problem addressed by this research relates to English language teaching at the Unidad Educativa de las Fuerzas Armadas, Colegio Militar Nro. 3 Héroes del 41, located in the city of Machala, in the province of El Oro. Learning takes place in an educational environment where

traditional methods based on grammar and the repetition of content through memorization predominate. Although traditional methodology is useful for learning structure, it prevents students from having opportunities to practice the language in real contexts, particularly affecting their ability to speak and write with fluency. If this approach to teaching continues unchanged, students will persist in facing communication difficulties, will display low confidence when expressing themselves and will rely excessively on grammatical rules. This affects their academic performance, reduces their motivation and limits their future opportunities in academic, social and professional settings, where English is an essential tool for personal growth and career development.

In light of this situation, the following research question arises: In what ways do artificial intelligence educational applications impact the development of integrated English language skills among second-year secondary school students at the Unidad Educativa de las Fuerzas Armadas, Colegio Militar Nro. 3 Héroes del 41? The following guiding questions have also been formulated for the study: a) What are students' perceptions regarding the usefulness of the ELSA Speaking and Writing & Improve applications in strengthening oral and written expression in English? b) What level of proficiency do students demonstrate in the basic skills of pronunciation, fluency, spelling and punctuation? c) What is the design of a didactic process aimed at articulately integrating oral and written production skills through the use of ELSA Speaking and Writing & Improve in the English classroom? d) To what extent does the implementation of practical exercises supported by ELSA Speaking and Writing & Improve contribute to the strengthening of integrated speaking and writing skills among students?

Research Objectives

In this regard, the research sets out the following general objective: To analyze the impact of artificial intelligence educational applications on the development of integrated English language skills among second-year secondary school students at the Unidad Educativa de las Fuerzas Armadas, Colegio Militar Nro. 3 Héroes del 41. In order to achieve this, the following specific objectives were proposed: a) To describe students' perceptions of the usefulness of the ELSA Speaking and Writing & Improve applications in strengthening oral and written expression in English. b) To assess the level of proficiency demonstrated by students in the basic skills of pronunciation, fluency, spelling and punctuation. c) To design a didactic process through which oral and written production skills are articulately integrated via the use of ELSA Speaking and Writing & Improve in the English classroom. d) To determine the contribution of the implementation of practical exercises supported by ELSA Speaking and Writing & Improve to the strengthening of integrated speaking and writing skills among students.

Research Hypothesis

In accordance with the research objectives, the following null hypothesis was formulated: H0: Artificial intelligence educational applications do not have an impact on the development of

integrated English language skills. Likewise, the following alternative hypothesis was established: H1: Artificial intelligence educational applications do have an impact on the development of integrated English language skills.

Justification of the Research

This research is justified in that it allows for an understanding, from a theoretical standpoint, of how Artificial Intelligence applications can transform teaching by moving beyond the traditional methods that have focused for years on grammar and memorization. On a practical level, it offers a more dynamic teaching alternative that is better aligned with current communicative needs. From a methodological perspective, it provides evidence on the use of a pre-experimental design applied in real school contexts. Furthermore, it is socially relevant as it supports students who need to strengthen their communicative skills in order to face increasingly demanding academic and professional environments. It is also economically viable, given that the majority of AI tools used are freely accessible and can be used on common devices.

Significance of the Research

The relevance of this study lies in the fact that it responds to the need to improve students' ability to communicate effectively in English, overcoming the limitations generated by models focused solely on rules and memorization. Its significance is also reflected in the methodological innovation it introduces, by incorporating AI tools that offer immediate feedback, autonomous practice and opportunities to develop speaking and writing skills in more realistic situations. The direct beneficiaries are the students, who will be able to access more motivating and functional learning experiences, and the teachers, who will have a complementary resource to enrich their practice. The potential impact is considerable, as an improvement in communicative skills opens doors to higher education and the professional world. Furthermore, this research is aligned with UNESCO's Sustainable Development Goal 4, which seeks to guarantee inclusive and quality education by promoting innovative methods that ensure relevant and equitable learning outcomes.

MATERIALS AND METHODS

Research Paradigm and Approach

In accordance with the research problem and the objectives set out, the study is framed within the positivist paradigm and a quantitative approach. Castrillo (2024) establishes that this paradigm considers reality to be observable, quantifiable and explainable through objective data, allowing for the analysis of changes occurring within a given phenomenon. In turn, the quantitative approach, according to Ramírez (2021), allows for the examination of relationships between variables and the testing of hypotheses through systematic procedures, which is consistent with the purpose of evaluating the effect of an educational strategy on a specific group of students. In this way, the paradigm and approach adopted ensure the rigour and clarity necessary to assess the progress achieved through an educational intervention.

Research Design

This research adopts a design that allows for the observation of the effect of an educational intervention based on artificial intelligence applications on integrated English language skills. In this case, a pre-experimental design is used, understood as one that works with a single study group, to which a pre-test is administered before the intervention and a post-test after it, with the aim of identifying possible changes attributable to an educational treatment (Arias and Covinos, 2021). This type of design is appropriate when the aim is to assess the influence of a strategy without the availability of comparison groups, whilst still obtaining clear evidence of the progress achieved. In this way, this design offers a relevant approach for analyzing advances in speaking and writing following the implementation of artificial intelligence tools, as proposed in the objectives of the study.

Scope of the Research

Furthermore, the descriptive-explanatory scope, described by Galarza (2020) as one that first allows for the description of an initial situation and subsequently analyses the changes generated following an intervention, guides this study. The descriptive level helps to characterize the state of artificial intelligence application use and speaking and writing skills both before and after the treatment. At the same time, the explanatory level allows for an assessment of whether the educational strategy applied contributed to the improvement of these skills by comparing the pre-test and post-test results. In this way, this scope combines a detailed view of reality with an analysis that seeks to understand the concrete effects of the technological intervention.

Population and Sample

In order to adequately organize the research process, the population and sample of the study were defined in terms of who forms part of the study and how the group was selected. According to Hernández and Mendoza (2020), the population is the total set of people, objects or elements that share characteristics relevant to the research, whilst the sample is a representative part of that population chosen to obtain the data. In this case, the population corresponds to all students at the Unidad Educativa de las Fuerzas Armadas, Colegio Militar N.º 3 "Héroes del 41", whilst the sample comprises 60 second-year secondary school students.

In order to select the participants, it was necessary to opt for a sampling method that was suited to the characteristics of the military educational context and to the actual availability of the students and the provisions of the military educational authorities. In this case, non-probability convenience sampling was used, understood as a method in which participants are chosen based on their accessibility and presence in the environment where the research takes place, without resorting to random procedures. According to González (2021), this type of sampling is appropriate when the researcher needs to work with a group that is easily identifiable and available for the study. Table 1 presents the population and sample of the research.

Table 1

Research Population and Sample

Population: 1,732 students		
Sample	Frequency	Percentage
Male	41	68 %
Female	19	32 %
Total	60	100%

Source: Data obtained from the educational institution

Data Collection

In order to obtain the information required for this research, the survey technique was employed, as it allows data to be collected in a direct, organised and systematic manner from the perspective of the participants themselves (Puente, 2020). This technique was implemented through a closed structured questionnaire consisting of 18 questions with response options on a four-level Likert scale (Always, Almost Always, Sometimes and Never), which facilitated the quantification and comparison of results (Cisneros et al., 2022). The questions addressed, on the one hand, the use and perception of artificial intelligence applications in the English classroom and, on the other, the level of proficiency that students demonstrate in the skills of pronunciation, fluency, vocabulary, grammatical structure, spelling and punctuation.

The instrument was designed on the basis of the variable operationalization process, with dimensions and indicators defined beforehand in a manner consistent with the objectives of the study. In this regard, the questionnaire allowed for the generation of sufficient information to address both the general objective and the specific objectives set out. It should be noted that, in order to assess the second specific objective, related to the level of proficiency in basic skills, items 11 to 18 were used as pre-test and post-test, corresponding to the self-assessment of performance in oral and written production. The remaining items were used to analyze perceptions and the implementation of artificial intelligence use within the learning process.

Validity and Reliability of the Data Collection Instrument

The instrument was reviewed and validated by experts in research methodology, who issued an approval document guaranteeing the relevance and coherence of the items. In addition, the questionnaire was subjected to a reliability analysis using Cronbach's alpha coefficient, the result of which, presented in Table 2, reached a value of 0.879, considered to represent a good level of internal consistency.

Table 2

Reliability Statistics

Cronbach's Alpha	Number of Items
0,878	17

Note: Value calculated using SPSS

This calculated value ensures that the data obtained have the necessary rigour to support subsequent analyses. Once the instrument was administered, the data obtained were organised and processed using the Statistical Package for the Social Sciences (SPSS), which allowed for reliable statistical analyses to be carried out.

RESULTS

The numerical results obtained are based on the administration of the questionnaire consisting of 18 structured questions on a four-level Likert scale. The items addressed two main dimensions: on the one hand, the use and perception of artificial intelligence-based applications within the teaching-learning process of speaking and writing were addressed in questions 1 to 10; and on the other hand, the level of proficiency that students demonstrate in basic oral and written production skills, such as pronunciation, fluency, vocabulary, grammatical structure, spelling and appropriate use of punctuation marks, were addressed in questions 11 to 18.

In order to interpret the results, the numerical values corresponding to the response options were recoded into two groups to facilitate comparative analysis. The first group comprised the options: Always (A=4) + Almost Always (AA=3), which grouped the favourable or higher-frequency responses. The second group comprised the options: Sometimes (S=2) + Never (N=1), which grouped the lower-frequency or unfavorable responses.

Of the 18 questions comprising the instrument, the first ten were considered in order to address the first specific objective, related to perceptions of the use and usefulness of artificial intelligence applications. Accordingly, Table 3 is presented below, the results of which allow for the analysis corresponding to this objective to be developed.

Table 3

Consolidated Frequency Summary

No.	Question	S+CS	AV+N
1	Does your teacher use artificial intelligence–based applications as part of the instructional materials for English classes?	4	56
2	Does your teacher employ artificial intelligence as a tool to correct grammatical writing errors in English?	3	57
3	Does the use of artificial intelligence applications motivate you to learn the English language?	25	35
4	Does your teacher incorporate interactive English activities that utilize artificial intelligence features to reinforce vocabulary acquisition?	4	56
5	Do you receive immediate feedback on the quality of your English writing through artificial intelligence applications?	12	48
6	Do you think that the use of artificial intelligence facilitates the learning of writing skills in English?	43	17
7	Do you use artificial intelligence applications to perform pronunciation exercises in English?	20	40
8	Do you use artificial intelligence applications as a tool to correct pronunciation errors in English?	12	48

9	In the English language teaching–learning process, does your teacher facilitate knowledge acquisition through the use of artificial intelligence to develop integrated oral production skills?	1	59
10	In the English language teaching–learning process, does your teacher facilitate knowledge acquisition through the use of artificial intelligence to develop integrated	1	59

Note: The options Always and Almost Always were grouped under the A+AA column, whilst the responses Sometimes and Never were combined under the S+N column.

Likewise, Table 4 is presented below, which contains the results of the remaining eight questions, which were used as a pre-test to assess the initial level of proficiency in the integrated speaking and writing skills, in line with the second specific objective of the research.

Table 4

Pre-test Results for Integrated Skills

Nro.	Question	S+CS	AV+N
11	Does the student correctly pronounce the English language?	2	58
12	Does the student communicate fluently in English?	10	50
13	Does the student use appropriate vocabulary when presenting a topic in English?	4	56
14	Does the student correctly structure sentences when speaking in English?	0	60
15	Does the student use appropriate vocabulary when writing texts in English?	11	49
16	Does the student correctly structure grammatical sentences when writing in English?	10	50
17	Does the student demonstrate correct spelling when writing in English?	11	49
18	Does the student correctly use punctuation marks when writing in English?	4	56

Note: The options Always and Almost Always were grouped under the A+AA column, whilst the responses Sometimes and Never were combined under the S+N column.

Results Relating to Specific Objective 1: Describing students' perceptions of the usefulness of the ELSA Speaking and Writing & Improve applications in strengthening oral and written expression in English

In order to gain insight into students' perceptions of the usefulness of the ELSA Speaking and Writing & Improve applications in strengthening oral and written expression in English, the results corresponding to the first ten questions of the instrument were analyzed, recoded into two comparative categories as presented in Table 3.

The data show that, in terms of actual implementation within the classroom, the majority of students consider the use of Artificial Intelligence-based applications to be limited. In question 1, which addresses the incorporation of applications as part of teaching materials, in question 2, concerning the use of artificial intelligence to correct grammatical errors, and in question 4, regarding the inclusion of interactive activities to reinforce vocabulary, favourable responses were

minimal compared to a marked majority who indicated Sometimes or Never. Similarly, when asked whether the teacher facilitates the development of oral and written production through artificial intelligence (questions 9 and 10), virtually all students indicated that this occurs with low frequency.

When examining aspects related to feedback, a predominantly unfavorable perception was also observed. In question 5, which referred to whether students received immediate feedback on the quality of their writing through AI applications, the S+N category clearly predominated with 48 responses, suggesting that such feedback was not a frequent experience for the majority. Similarly, in question 8, focused on the use of applications as a support tool for correcting pronunciation errors, the same pattern was repeated: few favourable responses and a majority of 48 students indicated that this type of correction occurred only sometimes or never.

However, the perception changes when the potential usefulness of these tools is analyzed. In question 6, a considerable proportion of students indicated that artificial intelligence can indeed facilitate the learning of written English. An intermediate tendency was also observed in aspects such as motivation to learn (question 3) and the use of applications for pronunciation exercises (question 7), where favourable responses, although not in the majority, demonstrate an openness towards these technologies.

These results allow us to observe that, at an initial stage, the systematic use of applications such as ELSA Speaking and Writing & Improve was not an established practice in the classroom; however, students acknowledge their potential for strengthening both oral and written expression. This gap between low implementation and a positive perception of usefulness constitutes a relevant starting point for subsequently analyzing the impact of the application of a didactic process and practical exercises supported by AI.

Results of Specific Objective 2. Assessing the level of proficiency demonstrated by students in the basic skills of pronunciation, fluency, spelling and punctuation

In response to the second specific objective, aimed at assessing the level of proficiency demonstrated by students in the basic skills of pronunciation, fluency, spelling and punctuation, the results corresponding to items 11 to 18 of the questionnaire were analyzed. As in the previous analysis, the responses were grouped into two categories: A+AA (Always and Almost Always) as an indicator of a favourable perception of proficiency, and S+N (Sometimes and Never) as an indication of limited or insufficient proficiency.

About pronunciation, the results show a low initial level. In question 11, only 2 students considered that they pronounce English correctly, whilst 58 indicated that they do so only sometimes or never. This tendency is maintained in item 12, referring to communicative fluency, where 10 responses were favourable compared to 50 unfavorable. Likewise, question 13, concerning the use of vocabulary when presenting a topic, recorded only 4 positive responses compared to 56 negative ones. The most critical result was observed in item 14, related to the

correct structuring of sentences when speaking, where no student selected the higher-frequency categories, with all responses concentrated in the S+N category. These data allow us to infer that the self-perception of oral performance is considerably low, particularly with regard to syntactic organization and structural accuracy now of expression.

Regarding written production, the results show slight variations, although the general tendency remains predominantly unfavorable. In the appropriate use of vocabulary for writing texts, addressed in question 15, 11 students indicated frequent levels of proficiency, whilst 49 reported difficulties. Similarly, in question 16, concerning the grammatical structuring of written sentences, only 10 responses fell within the A+AA category compared to 50 in the S+N category. Spelling, addressed in question 17, yielded 11 favourable responses but 49 unfavorable ones, revealing insecurity in formal writing. Finally, regarding the correct use of punctuation marks, addressed in question 18, only 4 students indicated that they apply them consistently, whilst 56 acknowledged doing so infrequently.

These results demonstrate that, at an initial stage of the research, students perceived a limited level of proficiency in both oral and written skills. The greatest difficulties were concentrated in the structuring of sentences when speaking and in the appropriate use of punctuation in writing, followed by problems with pronunciation and grammatical accuracy. These initial results reveal the need for pedagogical strategies aimed at the comprehensive strengthening of communicative skills, which supports the relevance of designing a didactic process and implementing practical exercises supported by ELSA Speaking and Writing & Improve to strengthen students' integrated speaking and writing skills.

Results of Specific Objective 3. Designing a didactic process through which oral and written production skills are articulately integrated via the use of ELSA Speaking and Writing & Improve in the English classroom

Based on the results obtained in specific objective 1, where limited use of artificial intelligence educational applications and difficulties in the integrated skills of speaking and writing were evidenced, and in relation to specific objective 2, a didactic process was designed and implemented in which practical exercises supported by ELSA Speaking and Writing & Improve were applied.

The didactic process presented below, from Table 5 to Table 8, was planned to be developed progressively over 3 sessions of 35 minutes each across 4 weeks, with activities per session aimed at strengthening students' pronunciation, oral fluency and written production, promoting more active, practical and meaningful learning.

Table 5

Week 1: Familiarization and Practical Diagnosis

Element	Description
Weekly Objective	To introduce students to the guided use of the ELSA Speak and Writing & Improve applications, identifying their initial level of proficiency in pronunciation and writing.
Resources	Mobile devices or computers, ELSA Speak, Writing & Improve, projector, activity guide.
Methodology	Guided learning with technological support and participatory reflection.
Activity 1	Initial pronunciation exercises with ELSA Speak Time: 35 minutes • The teacher guides students on how to access and use the ELSA Speak application at a basic level. • Students carry out initial pronunciation exercises using simple words and phrases. • Each student reviews their baseline score and identifies their main phonetic difficulties.
Activity 2	Writing a short paragraph in Writing & Improve Time: 35 minutes • The teacher explains the basic structure of a simple paragraph in English. • Students write a short text about their daily routine (approximately 80 words). • The automatic feedback from the application is reviewed and the most frequent errors are discussed.
Activity 3	Group reflection on the use of AI Time: 35 minutes • Students share the difficulties they encountered in pronunciation and writing. • The teacher guides a reflection on how AI can support learning. • Initial perceptions of the use of these tools are recorded.

Note: Design and implementation carried out by the researcher.

Table 6

Week 2: Development of Specific Skills

Element	Description
Weekly Objective	To strengthen segmental pronunciation and basic grammatical structure through the systematic use of AI applications.
Resources	AI applications, grammar worksheets, student notebook.
Methodology	Guided practice and immediate technology-assisted feedback.
Activity 1	Practice of problematic sounds in ELSA Speak Time: 35 minutes • The teacher identifies the English sounds that present the greatest difficulty. • Students practice these sounds repeatedly with automatic feedback. • Students compare their current results with those obtained previously.
Activity 2	Writing of a descriptive paragraph in Writing & Improve Time. 35 minutes

	• The teacher explains the use of descriptive vocabulary and text organization. • The student writes a descriptive paragraph applying what has been explained. • The student corrects their text using the suggestions provided by the application.
Activity 3	Identification of correction patterns Time: 35 minutes • The student reviews the most frequent errors detected by the AI. • The teacher clarifies common grammatical doubts. • The student produces corrected examples based on the errors identified.

Note: Design and implementation carried out by the researcher.

Table 7

Week 3: Integration of Speaking and Writing

Element	Description
Weekly Objective	To integrate oral and written expression skills in contextualized communicative activities.
Resources	Mobile devices, AI applications.
Methodology	Communicative language learning and task-based learning.
Activity 1	Reading aloud with ELSA Speak Time: 35 minutes • The teacher selects short texts that have been previously studied. • The student reads the text aloud using the application. • The student analyses the feedback related to fluency and pronunciation.
Activity 2	Role-play based on created texts Time: 35 minutes • The teacher organizes students into pairs or small groups. • The student prepares dialogues based on their written texts. • The student performs the dialogues whilst the teacher provides feedback.
Activity 3	Writing and oral explanation Time: 35 minutes • The teacher guides the writing of a short email in English. • The student writes and corrects the text using Writing & Improve. • The student records an audio explaining the content of the text using ELSA Speak.

Note: Design and implementation carried out by the researcher.

Table 8

Week 4: Consolidation and Conclusion of the Intervention

Element	Description
Weekly Objective	To consolidate the integrated speaking and writing skills developed throughout the intervention and to conclude the instructional process by demonstrating the progress achieved by the students.
Resources	ELSA Speak, Writing & Improve, student notebook.
Methodology	Guided reinforcement, supervised autonomous learning and reflective conclusion.
Activity 1	Reinforcement of pronunciation and fluency with ELSA Speak Time. 35 minutes • The teacher revisits the main sounds and pronunciation patterns covered in previous weeks. • The student once again carries out pronunciation and guided reading exercises using ELSA Speak. • The student analyses the automatic feedback and recognizes the improvements achieved in fluency and oral clarity.
Activity 2	Integrated oral expression practice (storytelling) Time: 35 minutes • The teacher guides an oral narration activity based on personal experiences or everyday topics. • The student prepares and delivers their story orally, applying the recommendations previously received. • The student adjusts their intonation, rhythm and pronunciation with the support of the application's feedback.
Activity 3	Final reinforcement of written production with Writing & Improve Time: 35 minutes • The teacher recalls the basic criteria of coherence, vocabulary and grammatical structure covered during the intervention. • The student writes a final text of approximately 150 words, applying the knowledge acquired throughout the intervention. • The student reviews and improves their written work using Writing & Improve, consolidating the corrections learnt throughout the process.

Note: Design and implementation carried out by the researcher.

Results of Specific Objective 4. Determining the contribution of the implementation of practical exercises supported by ELSA Speaking and Writing & Improve to the strengthening of integrated speaking and writing skills among students.

In order to determine the contribution of the implementation of practical exercises supported by ELSA Speaking and Writing & Improve to the strengthening of integrated speaking and writing skills among students, the questionnaire used in the initial phase of the research was re-administered. On this occasion, only items 11 to 18 were considered, corresponding to the self-assessment of performance in pronunciation, fluency, vocabulary, grammatical structure, spelling and punctuation.

The results obtained from the re-administration of the instrument, following the consolidation of responses into two columns, A+AA (Always + Almost Always) and S+N (Sometimes + Never), are presented below in Table 9.

Table 9

Post-test Results for Integrated Skills

Nro.	Question	S+CS	AV+N
11	Does the student correctly pronounce the English language?	28	32
12	Does the student communicate fluently in English?	30	30
13	Does the student use appropriate vocabulary when presenting a topic in English?	26	34
14	Does the student correctly structure sentences when speaking in English?	24	36
15	Does the student use appropriate vocabulary when writing texts in English?	32	28
16	Does the student correctly structure grammatical sentences when writing in English?	29	31
17	Does the student demonstrate correct spelling when writing in English?	34	26
18	Does the student correctly use punctuation marks when writing in English?	27	33

Note: The options Always and Almost Always were grouped under the A+AA column, whilst the responses Sometimes and Never were combined under the S+N column.

In order to compare the pre-test and post-test results, the frequencies of favourable responses, always and almost always, were converted into a single numerical value for each question. To this end, the number of favourable responses was divided by the total of 60 students, thus obtaining a proportion ranging from 0 to 1. This procedure allowed for eight values to be obtained in the pre-test and eight in the post-test, facilitating the statistical comparison between both stages and enabling an objective identification of whether an improvement in the assessed skills had occurred. These data are presented below in Table 10.

Table 10

Comparison of Favourable Pre-test and Post-test Proportions

Question	11	12	13	14	15	16	17	18	Mean
Pretest	0,03	0,17	0,07	0,00	0,18	0,17	0,18	0,07	0,11
Postest	0,47	0,50	0,43	0,40	0,53	0,48	0,57	0,45	0,48

Note: The values correspond to the proportion of favourable responses (A+AA) relative to the total number of students (n = 60).

Prior to the comparative analysis between the pre-test and post-test results, it was necessary to verify the statistical behaviour of the data obtained. To this end, a normality test was applied in order to determine whether the distribution of values met the assumptions required for the use of parametric tests (Sánchez et al., 2024). Given that 8 pairs of data were analyzed, the

values of the Shapiro-Wilk test were considered, as this procedure is most recommended when the sample size is small.

Table 11
Normality Tests

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	gl	Sig.	Statistic	gl	Sig.
Pretest	0,295	8	0,039	0,833	8	0,064
Postest	0,116	8	0,200*	0,990	8	0,995

Note: Data obtained using the SPSS programme

Upon reviewing the results recorded in Table 11, it can be observed that, in the case of the pre-test, the significance value obtained was 0.064, whilst in the post-test it was 0.995. In both cases, these values are above the established significance level of 0.05. This indicates that both the pre-test and post-test data present a normal distribution, which allows the analysis to continue using parametric statistical tests.

Based on the normal distribution of the data, a parametric statistical test was applied to carry out the comparison between both evaluation stages. The choice of this type of test is grounded in the fact that parametric techniques allow for the analysis of mean differences with greater precision when the normality assumptions are met, offering more robust and reliable results for determining whether the changes observed following the intervention are statistically significant (Bautista et al., 2020). The data obtained from the application of this test are presented below in Table 12.

Table 12
Paired Samples Test

	Paired Differences					t	gl	Sig. (bilateral)
	Mean	Dev. Deviation	Dev. Standard Error	95% Confidence interval of the difference Lower	Upper			
Pretest Postest	-,370000	0,041404	0,014639	-,404615	-,335385	-25,276	7	0,000

Note: Data obtained using the SPSS programme.

The mean difference recorded between both stages was -0.370, indicating that the post-test values were higher than those of the pre-test. This average increase reflects an improvement in the proportion of favourable responses following the implementation of the didactic process supported by artificial intelligence tools. Likewise, the internal consistency of the instrument was high, with a Cronbach's alpha of 0.878, whilst the statistical significance obtained ($p < 0.05$) confirms that the observed differences are not attributable to chance, but rather to the effect of the intervention applied.

Furthermore, the 95% confidence interval for the mean difference ranged from -0.404 to -0.335, demonstrating that the observed improvement is not the result of chance, but rather

remains within a consistent range of increase. The t-value obtained (-25.276) with 7 degrees of freedom and a two-tailed significance of 0.000 demonstrates that the probability of this difference being attributable to random variation is practically null ($p < 0.05$).

By considering the significance value of 0.000 as lower than the established threshold of 0.05, the null hypothesis is rejected and the alternative hypothesis (H_1) is accepted, which holds that artificial intelligence educational applications do have an impact on the development of integrated English language skills. These results allow us to affirm, from a statistical analysis perspective, that the intervention applied contributed significantly to the improvement of students' communicative performance.

DISCUSSION

The results showed that, on the one hand, the majority of students reported that the use of artificial intelligence applications in the classroom was infrequent, and on the other, they demonstrated a more favourable disposition when asked about the usefulness of AI in supporting learning, particularly in writing and, to a lesser extent, in motivation and pronunciation. This combination is consistent with what Li (2022) highlights, namely that AI can provide immediate feedback and personalised activities, but also suggests that these benefits are realised only when there is genuine and sustained use. In the same way, the results are related to the findings of Huang et al. (2022), by demonstrating that AI can complement the development of speaking and writing, although in this case the initial evidence indicated that such integration had not yet been consolidated in everyday classroom practice.

The low results regarding immediate feedback in writing and pronunciation correction suggest that students were not regularly receiving one of the most distinctive benefits of these technologies. This partially contrasts with what Ayala and Alvarado (2023) and Kolegova and Levina (2024) propose, highlighting the flexibility and personalization of AI; in the context investigated, students' perceptions showed that these advantages were not yet being fully expressed due to the limited presence of AI in the classroom. However, the fact that many students considered AI to facilitate writing reinforces what Fitria (2021) maintains: these technologies tend to generate more dynamic environments and raise motivation, although in this case that effect appears more as a positive expectation than as a widespread prior experience. Likewise, the intermediate values regarding motivation are consistent with Schmidt and Strassner (2022), who associate AI tools with autonomy and self-regulation; even when the classroom did not integrate them systematically, some students appear to recognize their value for learning in a more independent manner.

The research data showed a low initial level in basic skills, particularly in pronunciation, fluency, oral structuring and use of punctuation. This situation is consistent with what Syuhra et al. (2025) indicate regarding the persistence of approaches centred on grammar and

memorization, which ultimately weaken the development of real communicative skills. In the same vein, the initial results support what Armendáriz et al. (2024) describe, noting that when learning is concentrated on formal structures without meaningful practice, fluency and functional communication are adversely affected. From this perspective, the initial data reflect precisely that need for interactive scenarios and constant feedback, in line with what Mayorga and Tibán (2024) propose regarding meaningful learning in speaking and writing.

When analyzing the effects of the didactic process and the pre-test/post-test comparison, a substantial increase was observed across all research questions. This improvement is related to findings reported by studies that highlight the potential of specific tools; for example, Anggraini (2022) notes improvements in pronunciation associated with ELSA Speak, and in the post-test of this research a notable increase in the perception of correct pronunciation and fluency is observed. Similarly, the improvement in writing is related to what authors who have studied adaptive platforms and automated feedback describe, such as Xiaofan and Annamalai (2025) and Sehlaoui (2024), who link these environments with improvements in performance, motivation and progress in writing.

Furthermore, the improvement in speaking and writing skills is also consistent with what Alqaed (2024) and Sari (2023) propose, highlighting that the use of AI can reduce dependence on rote learning, promote more consistent corrections and enhance meaningful interaction. In this case, the increase in values from the pre-test to the post-test demonstrates that, when exercises were applied in an organised manner, students had greater opportunities to practice, adjust and improve. This is also related to what Marghany (2023) notes regarding the impact of individualized feedback on oral fluency and accuracy, as the post-test shows a significant advance in areas that were particularly low at the outset. In turn, the idea that AI can support autonomy and fluency, as mentioned by Al-khresheh (2024), is reflected in the general pattern of improvement following the implementation of the didactic process. The results allow us to maintain that the effect of artificial intelligence tools depends not solely on their technological availability, but on the manner in which they are integrated into a structured didactic sequence.

Authors such as Hipo et al. (2022) and Murillo et al. (2021) maintain that when skills are worked on in an articulated manner, each one reinforces the other; in this research, speaking and writing were addressed in parallel, which may explain why the improvements were not limited to a single aspect, but were observed in both oral and written expression. Similarly, the idea of skills integration and contextualized activities is related to what Mahapatra (2024) puts forward, whilst the subsequent advances in writing and vocabulary are consistent with the results reported by Sapan and Uzun (2024) in experiences where digital resources are incorporated as a support for English language learning.

CONCLUSIONS

Regarding the usefulness of the ELSA Speaking and Writing & Improve applications, it is concluded that, at the initial stage of the research, these tools did not form a regular part of the learning process in the classroom. The majority of students indicated that the use of artificial intelligence applications was infrequent and that immediate feedback on aspects such as pronunciation and writing was not an established practice. However, it was also evident that a significant proportion recognized the potential of these technologies to facilitate learning, particularly in written production. This allows us to affirm that, although implementation was limited, a favourable perception existed regarding their pedagogical usefulness. The pre-test results showed that students presented significant difficulties in both oral expression and written production. The greatest weaknesses were identified in the structuring of sentences when speaking, correct pronunciation and the appropriate use of punctuation marks. These data reflected that, prior to the implementation of the didactic process, the group did not perceive itself as having a solid command of the integrated speaking and writing skills, which justified the need for a specific pedagogical strategy to strengthen these abilities.

A structured didactic process was designed and implemented that articulately integrated oral and written production through the use of ELSA Speaking and Writing & Improve. The progressive planning across four weeks, with activities oriented towards guided practice, immediate feedback and reflection on learning, allowed for the work to be organised in a manner consistent with the needs identified in the initial diagnosis. This process not only incorporated technological tools, but integrated them within an intentional pedagogical sequence, centred on the active and meaningful development of communicative skills.

The post-test results demonstrated a significant improvement in all assessed skills. The proportions of favourable responses increased considerably in comparison with the pre-test, and the statistical analysis using the paired samples t-test confirmed that the difference between both stages was significant ($p < 0.05$). This allows us to conclude that the didactic intervention supported by ELSA Speaking and Writing & Improve had a positive and verifiable impact on the strengthening of integrated speaking and writing skills. As a future projection, it is recommended that the research be extended to larger samples and diverse educational contexts, with the aim of determining whether the observed effects are maintained at other levels of education and over more extended periods.

REFERENCES

Al-khresheh, M. H. (2024). The Future of Artificial Intelligence in English Language Teaching: Pros and Cons of ChatGPT Implementation through a Systematic Review. *Language Teaching Research Quarterly*, *43*, 54-80. https://eric.ed.gov/?id=EJ1457241

Alqaed, M. A. (2024). AI in english language learning: Saudi Learners´ perspectives and usage. *Advanced Education*, 125-142. https://doi.org/10.20535/2410-8286.318972

Anggraini, A. (2022). Improving Students' Pronunciation Skill Using Elsa Speak Application. *Journey*, *5*(1), 135-141. https://doi.org/10.33503/journey.v5i1.1840

Arias Gonzáles, J. L., & Covinos Gallardo, M. (2021). Diseño y metodología de la investigación. *Enfoques Consulting EIRL*, *1*(1), 66-78.

Armendáriz, I. A. U., Ramirez, P. L. V., & Alburqueque, C. R. M. (2024). Embracing Communicative Language Teaching: Fostering Fluency, Accuracy, and Authentic Communication: Adoptar la enseñanza comunicativa de idiomas: Fomentar la fluidez, la precisión y la comunicación auténtica. *Boletín Científico Ideas y Voces*, *4*(3), ág-117.

Ayala-Pazmiño, M., & Alvarado-Lucas, K. (2023). Integrating Artificial Intelligence into English Language Education in Ecuador: A Pathway to Improved Learning Outcomes. *Digital Publisher CEIT*, *8*(3–1), 679-687.

Bautista-Díaz, M. L., Victoria-Rodríguez, E., Vargas-Estrella, L. B., & Hernández-Chamosa, C. C. (2020). Pruebas estadísticas paramétricas y no paramétricas: Su clasificación, objetivos y características. *Educación y salud boletín científico Instituto de Ciencias de la Salud Universidad Autónoma del estado de Hidalgo*, *9*(17), 78-81.

Castrillo, C. J. H. (2024). Paradigma Positivista. *Boletín Científico de las Ciencias Económico Administrativas del ICEA*, *12*(24), 29-32. https://doi.org/10.29057/icea.v12i24.12660

Chicaiza, V. A. P., Montaluisa, B. M. C., Cedeño, J. del C. M., Ayala, E. T. M., Teresa, S. V. E., & Parraga, A. P. B. (2025). Inteligencia Artificial y Aprendizaje de Idiomas: Personalización del Aula de Inglés a Través de Plataformas Adaptativas. *Revista Veritas de Difusão Científica*, *6*(2), 477-506. https://doi.org/10.61616/rvdc.v6i2.643

Cisneros Caicedo, A. J., Guevara García, A. F., Urdánigo Cedeño, J. J., & Garcés Bravo, J. E. (2022). Técnicas e Instrumentos para la Recolección de Datos que Apoyan a la Investigación Científica en Tiempo de Pandemia. *Dominio de Las Ciencias*, *8*(1), 1165-1185. http://dx.doi.org/10.23857/dc.v8i41.2546

Fitria, T. N. (2021). The use Technology based on Artificial Intelligence in English Teaching and Learning. *ELT Echo : The Journal of English Language Teaching in Foreign Language Context*, *6*(2). https://doi.org/10.24235/eltecho.v6i2.9299

Galarza, C. A. R. (2020). Los alcances de una investigación. *CienciAmérica: Revista de divulgación científica de la Universidad Tecnológica Indoamérica*, *9*(3), 1-6.

González, O. H. (2021). Aproximación a los distintos tipos de muestreo no probabilístico que existen. *Revista Cubana de Medicina General Integral*, *37*(3).

Guzmán Sánchez, X., & Esquivel Rivero, Y. (2025). Uso de herramientas digitales innovadoras para optimizar la enseñanza y el aprendizaje del inglés en bachillerato. *593 Digital Publisher CEIT*, *10*(3), 196-203. https://doi.org/10.33386/593dp.2025.3.3133

Hernández-Sampieri, R., & Mendoza, C. (2020). *Metodología de la investigación: Las rutas cuantitativa, cualitativa y mixta*.

Hipo, L. A. Q., Costales, S. N. C., Llerena, K. Y. C., & Guzmán, D. C. C. (2022). Integrated Skills Approach improves the communicative competence in EFL students. *Polo del Conocimiento: Revista científico-profesional*, *7*(7), 1189-1213. http://10.23857/pc.v7i7

Huang, H.-L., Hwang, G.-J., & Chen, P.-Y. (2022). An integrated concept mapping and image recognition approach to improving students' scientific inquiry course performance. *British Journal of Educational Technology*, *53*(3), 706-727. https://doi.org/10.1111/bjet.13177

Kolegova, I. A., & Levina, I. A. (2024). *Using artificial intelligence as a digital tool in foreign language teaching*. https://10.14529/ped240110

Li, Y. (2022). Teaching mode of oral English in the age of artificial intelligence. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.953482

López Minotta, K. L., Chiappe, A., & Mella Norambuena, J. (2025). *Implementation of artificial intelligence to improve english oral expression*.

Mahapatra, S. (2024). Impact of ChatGPT on ESL students' academic writing skills: A mixed methods intervention study. *Smart Learning Environments*, *11*(1), 9. https://doi.org/10.1186/s40561-024-00295-9

Marghany, M. M. (2023). Using artificial intelligence-based instruction to develop EFL higher education students' essay writing skills. *CDELT Occasional Papers in the Development of English Education*, *82*(1), 219-240. https://doi.org/10.21608/opde.2023.313623

Mayorga Román, M. G., & Tibán Huilca, S. F. (2024). Impacto de una estrategia contextualizada en la enseñanza de unidades de masa y volumen. *Educación química*, *35*(3), 86-101. https://doi.org/10.22201/fq.18708404e.2024.3.87683

Murillo, M. G. E., Murillo, R. de los Á. B., Valle, V. V. Y., & Sangucho, N. F. T. (2021). La tecnología como herramienta combinanda para la enseñanza del inglés. *Polo del Conocimiento: Revista científico-profesional*, *6*(9), 1270-1284. http://10.23857/pc.v6i9.3109

Puente, R. T. (2020). El método de encuesta. *Los métodos de investigación para la elaboración de las tesis de maestría en educación*, 51-60.

Ramírez, E. R. S. (2021). Lo cuantitativo y lo cualitativo en la investigación científica educacional. Una visión desde la filosofía: The quantitative and the qualitative in

educational scientific research. A view from philosophy. *Revista Iberoamericana de Investigación en Educación*, *1*(1), 100-107.

Román, M. G. M., Paz, K. P. V., Bonifaz, C. A. C., & Román, M. A. U. (2025). Inclusión educativa como garantía del derecho a una educación básica de calidad: Educational inclusion as a guarantee of the right to quality basic education. *LATAM Revista Latinoamericana de Ciencias Sociales y Humanidades*, *6*(3), 864-879. https://doi.org/10.56712/latam.v6i3.3995

Sanabria Navarro, J. R., Silveira Pérez, Y., Pérez Bravo, D. D., & Cortina Núñez, M. de J. (2023). Incidencias de la inteligencia artificial en la educación contemporánea. *Comunicar: Revista Científica de Comunicación y Educación*, (77), 97-107. https://doi.org/10.3916/C77-2023-08

Sánchez-Solis, Y., Raqui-Ramirez, C. E., Huaroc-Ponce, E. J., & Huaroc-Ponce, N. M. (2024). Importancia de Conocer la Normalidad de los Datos Utilizados en los Trabajos de Investigación por Tesistas. *Revista Tecnológica-Educativa Docentes 2.0*, *17*(2), 404-413. https://doi.org/10.37843/rted.v17i2.554

Sapan, M., & Uzun, L. (2024). The Effect of ChatGPT-Integrated English Teaching on High School EFL Learners' Writing Skills and Vocabulary Development. *International Journal of Education in Mathematics, Science and Technology*, *12*(6), 1657-1677. https://doi.org/10.46328/ijemst.4655

Sari, N. (2023). The role of artificial intelligence (AI) in developing English language learner's communication skills. *Journal on Education*, *6*(01), 750-757. http://jonedu.org/index.php/joe

Schmidt, T., & Strassner, T. (2022). Artificial Intelligence in Foreign Language Learning and Teaching. *Anglistik*, *33*(1), 165-184. https://doi.org/10.33675/ANGL/2022/1/14

Sehlaoui, F. Z. (2024). Integrating AI in Foreign Language Teaching and Learning: Learner Autonomy and Tool Utilization in an Algerian University. *Passerelle*, *13*(2), 116-139. https://asjp.cerist.dz/en/article/259721

Syuhra, M. N., Chandra, N. E., & Rosalina, E. (2025). Artificial Intelligence in English Language Teaching: A Systematic Literature Review of Tools, Impact, and Challenges. *Voices of English Language Education Society*, *9*(1), 193-205. https://doi.org/10.29408/veles.v9i1.29745

Xiaofan, W., & Annamalai, N. (2025). Investigating the Use of AI Tools in English Language Learning: A Phenomenological Approach. *Contemporary Educational Technology*, *17*(2). https://eric.ed.gov/?id=EJ1470007