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Teaching Tools Based on Artificial Intelligence to Strengthen English Language Skills

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Abstract

The use of tools based on artificial intelligence is taking an important role every day in the teaching and learning processes, which is why this study promotes the use of a repository of tools based on artificial intelligence to strengthen language skills. English seeking to help students develop the four skills necessary for learning English (listening, speaking, writing and reading). For the investigative process, a mixed methodology was used, a pretest was applied, obtaining an average value of 6.3 and once the repository was used with practical activities supported by artificial intelligence tools, a post test was applied with an average rating of 9, demonstrating a very notable improvement which evidenced the improvement of language skills. It is concluded that the proposed activities based on artificial intelligence tools motivated and stimulated students, improving their academic performance in learning the English language.

Keywords: Artificial intelligence tools, Technology, Didactics, English, Education

1. Introduction

Artificial Intelligence (AI) has sparked considerable interest in various areas, with education being one of the highlights, where limited access and knowledge need to overcome a gap through the

acquisition of new knowledge (Punar Özçelik & Yangın Ekşi, 2024). The development and constant evolution of digitization and automation in the educational context are closely linked to advancements in information and communication technology.

In future education, AI is expected to have an impact on the teaching process. The projection towards primary and secondary education corresponds to breaking barriers and paradigms associated with traditional education, with the aim that AI supports the ability to comprehend and communicate competently through decision-making support systems (Syahrizal et al., 2024).

Integrating digital skills into AI-assisted education can generate in students the necessary skills for future challenges. Thus, implementing artificial intelligence in educational processes allows for increased human performance, reevaluating roles and the need for training that reinforces competencies for the workforce (Upadhyaya & Vrinda, 2021). Including AI with students from an early age can lead the education system to adopt new knowledge and adapt to technological advancements, improving expected learning outcomes.

In the era of the Fourth Industrial Revolution, the adoption of various skills, including critical thinking and problem-solving, is necessary (Al-Qawabah, 2024). Thus, in the educational context, foreign language teaching recognizes the importance of integrating 21st-century digital tools to promote the comprehensive development of language skills, particularly in oral expression. According to Huertas-Abril (2021), the implementation of these tools in the English as a Foreign Language classroom is crucial to enable students to acquire new competencies and oral skills in line with the changing demands of the modern world.

The concept of new literacies emerges as a relevant theoretical framework to understand this phenomenon. In this sense, the focus lies not only on acquiring basic reading and writing skills but also on developing competencies in the effective use of digital tools and oral communication in digital environments (Getenet et al., 2024). This approach represents a significant shift in how English as a Foreign Language is conceptualized and taught, prioritizing students' ability to actively and effectively engage in today's digital society.

Recognizing individual capacities in the use of available technology in educational environments, including Artificial Intelligence (AI), underscores the urgent need for adequate literacy (Fügener et al., 2022; Yang et al., 2021). This is crucial to facilitate learner-centered educational processes, thereby enhancing educational experiences and acquiring the necessary knowledge to build upon existing or develop new skills. Therefore, integrating digital literacy into the educational environment becomes indispensable for the effective adoption of artificial intelligence technology.

Furthermore, Escobar-Murillo et al. (2021); Liu et al. (2023) examine technology as a combined tool for teaching English, highlighting its role in motivating and stimulating continuous learning both inside and outside the classroom, thereby contributing to improving students' language competence.

Current technological advancements consider the impact of Artificial Intelligence (AI) on education (Delgado et al., 2024). Based on a review of the convergence of AI with education, this study addresses the impact of AI on instructional and learning processes in the educational sector (Chassignol et al., 2018). As noted by Mitra (2021), technology is transforming learning at an accelerated pace, and AI is playing a crucial role in this transformation.

Harnessing Artificial Intelligence (AI) in the educational domain offers a range of significant advantages, among which personalized learning stands out. This customization is achieved by adapting to each student's individual characteristics, enabling a teaching approach that caters to their specific needs. AI enables content adaptation and the implementation of dynamic pedagogical strategies, thereby facilitating the achievement of learning objectives more effectively (Delgado et al., 2024). Another relevant aspect is personalized tutoring, known as intelligent tutoring, which simulates human interaction by providing detailed guidance, precise explanations, and personalized guidance. This tutoring approach not only offers more individualized support but can also adapt to each student's learning pace and style, thus promoting a more efficient and satisfactory learning

process (Kabudi et al., 2021; Mousavinasab et al., 2021; Murtaza et al., 2022).

This study is based on the ADDIE methodology (Analysis, Design, Development, Implementation, and Evaluation), as suggested by Ruiz and Bárcenas (Ruiz-Velasco & Bárcenas-López, 2022). This reflective and planned approach has been applied to design and implement a set of AI-based tools aimed at enhancing students' English language skills through group collaboration and knowledge exchange.

Through comprehensive student needs assessment and careful selection of digital tools, an enriched learning environment has been created that effectively integrates technology into the educational process.

The research aims to develop speaking, writing, reading, and listening skills in eighth-grade students of general basic education. It is noteworthy that they have traditionally learned the English language, and thus, interest has waned, and practice in the English language has diminished.

In today's education, it is essential for students to acquire new competencies, skills, and abilities through the use of various technological tools (Babori et al., 2021), and even more so if these are based on artificial intelligence, contributing to creating an ideal learning environment. This increases student motivation and leads to meaningful learning.

IA has revolutionized the way we interact with technology, leading to a substantial transformation in education, particularly in the realm of language learning. The ability of AI to analyze data, tailor content, and provide personalized feedback has created unprecedented opportunities in language teaching and learning for both students and educators. By understanding how AI can enhance the effectiveness and efficiency of teaching methods, we can harness its benefits to offer dynamic, interactive, and personalized learning experiences, empowering students to achieve a deeper mastery of the English language. In this regard, this work explores the impact of AI on the teaching and learning process of English and highlights its pivotal role in the ongoing evolution of education in the 21st century.

2. Literature Review

2.1 Artificial intelligence

Information and communication technologies have been introduced into education with the purpose of being used to support teaching processes. Artificial intelligence is a key component of Education 4.0, encompassing essential activities such as pattern recognition, problem-solving, decision-making, language identification and processing, machine learning, among others. AI is developed to mimic the functionality of the human brain and is constantly evolving (Gardner et al., 2021; Quy et al., 2023). In the literature review described below, it has been identified that the use of artificial intelligence tools to develop and enhance English language learning skills in teenagers has been highly beneficial as it enables them to increase their capacity for critical thinking, analysis, and practice through various exercises.

English language learning tools based on artificial intelligence have gained popularity due to their practicality, accessibility, and effectiveness (Núñez-Naranjo et al., 2024; Villegas & Lucas, 2002). These resources may include chatbots and applications for deep learning and machine learning for language acquisition. As Wei (2023) asserts, "AI-based English learning tools have become increasingly popular due to their convenience, accessibility, and effectiveness." The widespread acceptance of these tools is attributed to their ability to provide immediate feedback, adjust to the learner's pace, and offer personalized learning experiences (Reim et al., 2020).

According to Chen (2023)"the experimental group that used AI-based English learning tools scored significantly higher on the English proficiency test than the control group. Research has indicated that resources such as 'AI-based English learning programs can be highly successful in improving language skills'." This indicates that AI-based tools can be a useful supplement to conventional language learning techniques. It is essential to remember that these resources should be

used in addition to consistent practice and communication with native speakers.

According to Fitria (2021), "the use of AI-based English learning tools has raised concerns about the potential loss of human interaction and the quality of language learning." For language learners, the emergence of AI-based resources for language acquisition has brought about many opportunities, such as ensuring that students receive a comprehensive and effective education. It is crucial to strike a balance between the use of AI-based tools and conventional language learning techniques.

2.2 *ADDIE*

The ADDIE model, standardized into five steps: Analysis, Design, Development, Implementation, and Evaluation (Mambetova & Semushina, 2024), stands as a widely recognized instructional framework within the educational sphere. Its primary objective is to facilitate the effective management, support, implementation, and transmission of educational projects or studies (Wang, 2024).

Within the teaching process, the implementation of the ADDIE model necessitates careful planning and organization at each of its stages, from the initial analysis to the final evaluation (Lai et al., 2024). Effective coordination among educational elements, technological tools, materials, and involved individuals is crucial to achieving successful implementation. The introduction of intelligent tools for the teaching and learning process adds an additional layer of logistical and organizational complexity. This demands a deep understanding of how these tools can enhance the educational experience and empower student learning.

3. Methodology

To develop the proposal, we have worked with the ADDIE methodology, as mentioned by Ruiz-Velasco and Bárcenas- López (2022) Figure1. The ADDIE model is a reflective, planned, strategic, operational, and evaluated process to ensure the effectiveness of instructional material development through a design methodology.

Figure 1. Metodology ADDIE

The methodology is applied as follows:
- **ANALYSIS**: In this stage, an assessment was conducted regarding the needs and objectives of the educational process. To do so, key themes and contents were identified to address the learning objectives. Information was gathered about the target audience, including their characteristics, skills, and specific requirements. This stage also involved determining the available resources and limitations.
- **DESIGN**: During this stage, the overall design of the educational process was structured based on the results of the analysis. Specific learning objectives were defined for the development of English language skills expected to be achieved by the end of the educational process through a detailed plan. This plan included the sequence of topics, teaching strategies, evaluation methods, and necessary educational resources. Educational materials, activities, and support tools to be used during the implementation of the educational process were designed.
- **DEVELOPMENT**: In this stage, educational resources were created according to the plan designed in the previous stage. Teaching materials such as presentations, teaching guides, practical activities, and multimedia resources were developed. Technological tools based on

artificial intelligence were developed to enhance the development of the four language skills in the English language.

- **IMPLEMENTATION**: During this stage, the practical execution of the designed educational process was carried out by implementing the repository with artificial intelligence-based tools with interactive activities. Additionally, continuous guidance and support were provided to students to facilitate their participation in the learning process.
- **EVALUATION**: This is the final stage, where the effectiveness of the educational process was evaluated based on the established objectives. However, to obtain data demonstrating the effectiveness of the implementation, both pretest and post-test evaluations based on the development of English language skills were conducted. This involved collecting and analyzing data on student performance, learning satisfaction, and the effectiveness of educational resources.

3.1 Proposal

The present proposal has been developed and is being used by eighth-grade students at a basic education, general baccalaureate, and international baccalaureate educational center in the city of Latacunga. The population of this study consisted of four teachers from the institution's foreign language (English) department, as well as 36 students. Survey and interview techniques were used for data collection and analysis, with the instrument being the questionnaire (pretest and post-test). The survey was conducted with the entire population corresponding to the eighth grade of basic education. It comprised 10 questions structured as open-ended, closed-ended, and multiple-choice, and also included questions related to methodology, creative activities, and the use of AI tools. The interview consisted of 5 questions directed at the English teachers. The phases of implementing the ADDIE methodology are detailed below:

3.2 Analysis Phase

A comprehensive assessment of students' needs in the English learning process was conducted. Common language issues, learning styles, and specific areas where artificial intelligence tools could be highly beneficial were analyzed. Additionally, current limitations of accessible resources were taken into account, and precise standards for the selection and evaluation of these resources were established, ensuring their applicability and effectiveness in enhancing English language acquisition.

3.3 Design Phase

To facilitate access and navigation through the available tools, a website with an intuitive interface was created. The tools can be classified according to the skill to be improved, level of interactivity, adaptability, effectiveness, and to organize them according to their different purposes such as grammar, vocabulary, and pronunciation. Users were given access to a feedback system through an informative video to assist them in correctly using the repository.

In the design phase, the following applications have been structured in the repository:

Table 1. Descriptive table of tools based on artificial intelligence.

SKILL	AI APPLICATION	PRINCIPAL FUNCTIONS
Writing	ProWritingAid	This tool uses AI to perform thorough analysis of the text, correcting grammatical errors and offering suggestions to improve writing style.
	Hemingway Editor	This tool provides analysis of text readability, identifies complicated sentences, and suggests improvements for clearer, more concise writing.
	Quillbot	This tool uses AI to creatively rewrite sentences and paragraphs, offering options to improve structure and vocabulary.
	Ginger	Use AI to correct grammar, spelling, and style, as well as offer suggestions to improve the writing and tone of

SKILL	AI APPLICATION	PRINCIPAL FUNCTIONS
		the text.
Listening	LingQ	This AI tool allows the auditory content to be adapted to the user's level of understanding and offers interactive transcripts.
	FluentU	This tool uses AI to recommend authentic audiovisual content, with subtitles and interactive exercises to improve listening comprehension.
	Memrise	It is an online language learning tool that uses images, sounds and games to teach languages.
	EnglishCentral	This tool uses speech recognition and pattern analysis to improve listening comprehension through videos with interactive activities.
Reading	Read Theory	It uses AI to adapt the reading level to individual abilities, offering texts and questions that adjust to the user's progress.
	Readlang	This tool allows you to import any text or choose from Readlang's own library, which includes articles; news, e-books and even web pages.
	Ling Q	This tool provides a library of varied content and allows you to mark and learn vocabulary while reading, adapting to the user's level.
	Scribd	This tool uses AI to recommend books and articles based on the user's reading preferences.
Speaking	Gliglish	This tool allows you to practice your skills conversational
	Smalltalk2	This tool talks to an AI coach about everyday topics, receiving real-time feedback on your pronunciation, grammar, and fluency.
	Lingq.com	This tool allows you to read meaning in the language you are learning while providing you with tools to improve your vocabulary, grammar, and comprehension.
	Babbel	It is a complete and effective tool that can help you improve your skills in a new language.

3.4 *Development phase*

In this phase, the tools are included in the repository created on Google Sites, considering their effectiveness and adaptability for the development of each of the skills (speaking, reading, listening, writing) in English language learning.

3.5 *Implementation Phase*

The implementation phase of the repository has ensured that users can access and utilize it. Instructions and resources were provided to effectively use the tools in both formal and informal educational environments.

3.6 *Evaluation Phase*

In this phase, the effectiveness of the tools and the repository in terms of how they impacted the improvement of English language proficiency was evaluated. Additionally, user satisfaction information was collected, and improvements in language proficiency were verified through a post-test. The repository was adjusted in response to the evaluation results for continuous improvement and updating.

During this phase, functional tests were conducted with high school students from an educational institution in the city of Latacunga. Once the repository was created, artificial intelligence-based tools were included.

4. Results

The survey respondents and interviewees accepted the parameters of listening, reading, writing, and speaking based on the following criteria: clarity in the formulation of statements, coherence in the detailed criteria for evaluating English language skills, relevance of activities in identifying each language skill, and understanding of the parameters by the teachers. Additionally, general aspects such as clear and precise instructions in the instrument, questions that enable the achievement of research objectives, and an appropriate number of questions to gather necessary information were accepted.

Descriptive statistics are conducted, but since the sample size is less than 50, the Shapiro-Wilk test is used to determine normality compliance. With a value greater than 0.05, it is determined that

the data obtained in the pretest and post-test are not normally distributed. Therefore, the Wilcoxon test was selected to determine if there is a significant difference between the pretest and post-test, Table 2, Table 3 and Figure 2.

Table 2. Descriptive

	PRETEST	**POSTEST**
N	36	36
Missing	0	0
Mean	6.26	8.71
Median	6.00	8.50
Standard deviation	0.914	0.857
Minimun	5.00	7.00
Maximun	8.00	10.0

Table 3. One sample T test

		Statistic	P	Mean difference		Effect size
Difference	Wilcoxon W	630	<.001	2.50	Spearman's rank correlation	1.00

Note: $H_a\, \mu \neq 0$

Obtaining a value <0.01 on the P score indicates a significant difference between the tests; thus, there is an improvement.
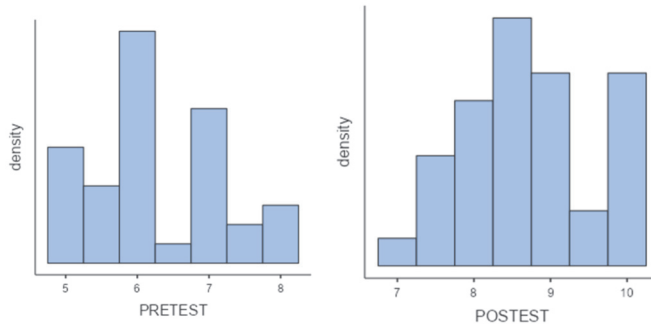

Figure 2. Pretest and postest

On the other hand, the analysis of each of the students' skills is carried out in relation to: reading, speaking, listening and writing; It is counted in the most relevant statistics, detailed in Table 5

Table 5. Descriptive analysis of English language skills

Descriptive								
	Pre-reading	**Pos-reading**	**Pre-writing**	**Pos-wrting**	**Pre-listening**	**Pos-listening**	**Pre-speaking**	**Pos-speaking**
N	38	38	38	38	38	38	38	38
Missing	0	0	0	0	0	0	0	0

Descriptive																
		Pre-reading		Pos-reading		Pre-writing		Pos-wrting		Pre-listening		Pos-listening		Pre-speaking		Pos-speaking	
Mean		1.49		1.64		1.34		1.82		1.26		1.74		1.16		1.68	
Median		2.00		2.00		1.00		2.00		1.25		1.75		1.00		2.00	
Standard deviation		0.692		0.464		0.669		0.426		0.452		0.239		0.495		0.426	
Minimun		0.00		1.00		0.00		0.00		0.00		1.50		0.00		1.00	
Maximun		2.00		2.00		2.00		2.00		2.00		2.00		2.00		2.00	
W de shapiro-wilk		0.731		0.656		0.768		0.504		0.918		0.699		0.664		0.682	
Valor p de shapiro-wilk		< .001		< .001		< .001		< .001		0.008		< .001		< .001		< .001	

Once it has been established that for each of the values of the language components there is no normality in the data, the Wilcoxon statistic is used to establish that there is consistency in the post-test data and that in one of the components (reading) although there is an improvement in the scores obtained by the students, this is not considered to be a significant improvement. On the other hand, in the three remaining language skills (speaking, listening and writing) the improvement of the scores statistically determined in this test by its p-value <0.01 shows that it is a significant improvement which identifies that the The use of AI-based tools was effective in improving writing, listening and speaking. This can be seen in the results detailed in Table 6.

Table 6. Paired Samples T Test

			Estadístico		p
POS-READING	PRE-READING	W de Wilcoxon	143	[a]	0.173
POS-LISTENING	PRE-LISTENING	W de Wilcoxon	325	[b]	< .001
POS-SPEAKING	PRE-SPEAKING	W de Wilcoxon	253	[d]	< .001
POS-WRTING	PRE-WRITING	W de Wilcoxon	245	[e]	< .001

Note. H_a μ Medida 1 - Medida 2 > 0

5. Discussions

The development of this work was based on the ADDIE methodology, as mentioned by Ruiz-Velasco and Bárcenas- López (2022). This reflective and planned approach allowed for the design and implementation of a set of artificial intelligence (AI)-based tools aimed at improving students' English language skills through group collaboration and knowledge exchange. AI has garnered significant interest in education (Punar Özçelik & Yangın Ekşi, 2024). This interest arises from the need to bridge the gap in the educational field, where limited access and knowledge about these technologies require further acquisition of expertise in the area.

In the educational context, the importance of integrating 21st-century digital tools to promote comprehensive development of language skills, especially in foreign language teaching, is recognized

E-ISSN 2240-0524
ISSN 2239-978X

Journal of Educational and Social Research
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Vol 14 No 4
July 2024

(Huertas-Abril, 2021). The implementation of AI-based tools in the English as a foreign language classroom is crucial to enable students to acquire new competencies and oral skills in line with the changing demands of the modern world (Getenet et al., 2024). This approach aims at acquiring basic reading and writing skills and developing competencies in the effective use of digital tools and oral communication in digital environments (Fügener et al., 2022; Yang et al., 2021).

AI-based English learning tools have gained popularity due to their practicality, accessibility, and effectiveness (Quy et al., 2023). These resources, including chatbots and deep learning and machine learning applications, have become increasingly popular for their ability to provide immediate feedback and offer personalized learning experiences (Reim et al., 2020). However, it is important to acknowledge concerns about potential impacts on human interaction and the quality of language learning (Yang et al., 2021).

The results of the paired samples T-test analysis and descriptive statistics provide a comprehensive view of the impact of the educational intervention on students' reading, writing, listening, and speaking skills.

The educational intervention in reading shows that the improvement is minimal, for which it must be analyzed from the application of the tools or teaching strategies, however, what refers to writing, listening and speaking, the results show greater consistency in the scores. from the post-test from which it can be determined that the students achieved a greater understanding, which is why the methodologies and strategies used in conjunction with the AI-based tools were effective because they managed to capture attention through the motivation and interest that these tools represented when developing the proposed activities.

While AI-based tools offer many opportunities to enhance language skills, it is essential to balance their use with conventional language learning techniques and encourage communication with native speakers.

6. Conclusions

An effective evaluation of English language learning was conducted through a pretest consisting of 10 questions designed to develop the 4 language skills in English. After tabulating the corresponding results, an overall average level of 6.3 was obtained. However, these findings indicate a solid foundation from which progress can be made, highlighting potential areas for further improvement and optimization of the learning process.

The content structure was based on the approach and implementation of artificial intelligence-based tools through practical exercises aimed at developing skills in English language learning. These tools were taught through workshops and practical exercises specifically designed to enhance English language learning. This strategy proved to be effective in boosting learning interactively and dynamically, enabling students to actively engage in their language skill acquisition process.

After the implementation and use of the repository, a post-application test was carried out in class, revealing a significant improvement with an average of 9 points for the course. This result indicates a strengthening in the students' language proficiency. After several months of continuous use of the tool, a substantial improvement was observed in the comprehension, speaking and writing of English. These encouraging results support continued use of the repository in classes to further improve students' language skills in the long term.

Additionally, a detailed analysis of reading, writing, listening and speaking skills was carried out before and after the educational intervention using the Wilcoxon test for paired samples. Regarding reading ability, the Wilcoxon statistic was 143 with a p-value of 0.173, which indicates that no significant difference was found between the pretest and posttest. This suggests that the strategies implemented in this area need to be reviewed and improved.

In contrast, writing ability showed a significant improvement with a Wilcoxon statistic of 245 and a p-value less than .001, evidencing that the applied methodologies were effective. Similarly, in listening skill, the Wilcoxon statistic was 325 with a p-value less than .001, indicating a significant

E-ISSN 2240-0524
ISSN 2239-978X

Journal of Educational and Social Research
www.richtmann.org

Vol 14 No 4
July 2024

improvement. Finally, speaking ability also presented a significant improvement, with a Wilcoxon statistic of 253 and a p-value less than .001, demonstrating the effectiveness of the educational intervention in the development of oral competence.

In conclusion, the evaluation of English learning through a pretest and posttest has revealed significant improvements in most linguistic skills, with the exception of reading, where no statistically significant changes were observed. The implementation of tools based on artificial intelligence and the dynamic teaching methodology contributed positively to the development of writing, listening and speaking skills. These results underscore the need to continue using and refining effective instructional strategies while reviewing and adjusting reading instructional strategies to achieve more consistent improvements. The observed improvement in language skills supports the continued use of the repository and other technological tools in the classroom to promote comprehensive, long-term learning of the English language.

7. Future Research Directions

Future studies plan to review the tools used for the development of reading skills with the aim of promoting significant improvements also in this area without neglecting other skills. On the other hand, as part of the study, the comparison of groups with and without the application of the proposal in order to determine in greater depth its incidence compared to a test group and another control group.

It also plans to explore other artificial intelligence-based tools available for learning the English language, including chatbots, machine learning applications and intelligent tutoring programs, among others. Exploring different types of tools could provide a more complete understanding of their effects on language learning. Additionally, future studies may include assessment of language skills such as cultural understanding, conversational fluency, and interpersonal communication proficiency.

8. Acknowledgment

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