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Impact of an Educational Program Based on the Design Thinking Methodology on English Language Learning in Primary School Students

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The objective of this research was to evaluate the impact of an educational program based on the design thinking methodology on English language learning in primary school students at a public educational institution. Using a quantitative approach and experimental design, an official sample test from the Cambridge A1 Movers exam was administered as a pretest and post-test to an experimental group. The study population consisted of regular elementary school students, and the sample consisted of 68 fourth-grade students. Finally, the results after the application of the educational program showed that there is a statistically significant difference in English language learning, improving oral comprehension and production skills, demonstrating a positive impact and suggesting that the design thinking methodology Favor's more dynamic and effective language learning.

Keywords: educational program, design thinking, English language learning, primary education, standardized test

INTRODUCTION

One of the main challenges for primary school teachers today is addressing the significant learning gaps left by more than two years of distance education with many limitations due to social isolation in the context of the pandemic. Among the most affected areas is English, a subject included in the public-school curriculum but not implemented effectively, especially at the primary level. In most institutions, English is taught as a foreign language, with little progress achieved in recent years. The abrupt transition to virtual learning deepened this gap, since many students, particularly in public schools, lacked access to stable internet connections and technological resources, which limited opportunities for interaction and communication in a foreign language.

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In Latin America, the educational situation during the health emergency was critical, as distance learning proved far less effective than expected in socioeconomically unequal contexts. According to the World Bank (2021), one of the most alarming consequences of the pandemic is the high number of children who completed primary school without developing basic reading comprehension skills in their mother tongue, which directly affects their ability to learn a second language. In addition, research indicates that the pandemic reduced opportunities for collaborative learning and peer communication in foreign language contexts (Guofang et al., 2021). This is reflected in the results of the EF English Proficiency Index (2022), which reports a "low" level of English proficiency in Latin America, with the region scoring below the global average.

Given this scenario, there is a clear need to explore innovative pedagogical approaches that allow schools to respond creatively and inclusively to the post-pandemic educational challenges. Design Thinking emerges as a valuable methodology because it focuses on empathy with students' needs, collaborative problem-solving, and the design of practical solutions to close the learning gaps in English language acquisition. By adopting this approach, teachers can better adapt strategies to the real conditions of their classrooms and promote meaningful learning experiences in a context still marked by inequality.

A review of previous studies reveals that the application of Design Thinking has been explored in diverse educational contexts, consistently showing positive effects on English language learning. Rodríguez (2023) in Colombia and Barona (2021) in Cali both used an action research approach with primary and secondary school students, reporting notable improvements in pronunciation, fluency, vocabulary, and participation. Similarly, Gamarra and Correa (2023) demonstrated that Design Thinking supported English language learning among Wiwa indigenous students, highlighting its adaptability to intercultural contexts and its impact on students' confidence in oral communication.

Beyond Latin America, Cleminson and Cowie (2021) investigated the role of Design Thinking with Japanese university students, emphasizing its potential to foster creativity, divergent thinking, and problem-solving while simultaneously strengthening English communication skills. Although their participants had a limited proficiency level (A2), the integration of ideation and creativity within language tasks allowed them to achieve progress in both writing and oral communication.

Taken together, these studies reveal common patterns: Design Thinking promotes active participation, enhances motivation, and strengthens language skills by integrating collaboration and creativity into the learning process. They also illustrate its versatility across different cultural and educational contexts. However, while the evidence is promising, most applications have been carried out in secondary or higher education settings. Far fewer studies have systematically addressed its potential in primary education, where pandemic-related learning gaps are most evident. This gap provides a clear justification for the present study, which seeks to apply Design Thinking to strengthen English language learning at the primary level.

The theoretical foundations are set out below, and the key concepts underpinning the study are specified.

Theories of English Language Teaching

Starting in the 1960s, various theories dedicated to explaining the psycho-cognitive processes that occur when acquiring a second language gained momentum in the context of Second Language Acquisition (SLA) studies. Ellis (2021) identifies four main phases. The first, associated with Dulay & Burt (1973) and Cancino et al. (1978), emphasizes error analysis and the initial processes of language acquisition. The second features are studies such as Kellerman (1983) on language transfer, Gass (1984) on universal grammar, and Thomas (1983) on pragmatics. The third, known as the cognitive phase, highlights Schmidt (1990), Ellis (2003), and Dekeyser (1998), focusing on implicit and explicit knowledge and the acquisition of skills. The fourth marks the "social turn," with Firth & Wagner (1997) and Lantolf & Swain (2006) emphasizing sociocultural perspectives. More recently, Larsen-Freeman (2008) and Ortega (2019) introduced the theory of complex dynamic systems and the multilingual turn.

These theoretical perspectives are particularly relevant to the present study, as they align with the principles of Design Thinking. For example, cognitive theories underscore the gradual acquisition of skills and the balance between implicit and explicit knowledge, which informs the design of iterative learning activities within Design Thinking cycles. Sociocultural theory emphasizes the importance of interaction, collaboration, and context in learning—a central aspect of Design Thinking's collaborative and empathy-driven process. Meanwhile, the perspective of complex dynamic systems resonates with the adaptability and flexibility of Design Thinking, which seeks to respond to changing learner needs in dynamic educational environments.

Therefore, SLA theories not only provide a framework for understanding how students learn English but also support the rationale for applying Design Thinking as a methodology that integrates cognitive, social, and dynamic dimensions of language learning into innovative program design.

Methodology Design Thinking

Herbert A. Simon (1969), winner of the Nobel Prize in Economics and author of the book "The Science of the Artificial," introduced the term Design Thinking. In 2008, Tim Brown, a professor at Stanford University's School of Engineering, developed the methodology originated by Herbert Simon. Although this methodology began to be deployed in the last decade, it is only in recent years that it has begun to be used more widely.

Stages of the Design Thinking Methodology

This method consists of five stages. The Design Thinking process is not linear, which allows you to move forward and backward through the stages as required by the project's development.

Stage 1: Empathize.

The empathize phase is characterized by the identification and deep understanding of learners' needs, expectations, and difficulties in the process of acquiring a second language. In English language teaching, this stage involves recognizing the diversity of students' learning styles, cultural backgrounds, and motivational factors that influence their progress. The main feature of this stage is the creation of an authentic connection with learners, where the teacher assumes the role of an observer and listener, gathering information through strategies such as interviews, focus groups, and classroom observations. These techniques make it possible to detect recurrent challenges, such as pronunciation barriers, limited vocabulary, or lack of confidence in oral expression. Another characteristic of this phase is the analysis of students' real-life contexts, which allows the design of learning activities that are relevant and meaningful. Therefore, empathy in the teaching of English is not limited to identifying linguistic deficiencies, but extends to understanding emotional, social, and cognitive dimensions that condition the learning experience.

Stage 2: Define.

At this stage, the problem is identified, considering elements such as people, needs, and findings, which are established in accordance with the work team. Prior to this, a quantitative and qualitative analysis process is carried out. This is a stage of delimitation and specification, seeking to define the variables of the project and specify the elements; the more specific, the better. The aim here is to define a concrete focus for action. In other words, one that can capture the most relevant aspects for the user, but which, at the same time, can be encompassed within oneself. It is from this approach that the creative challenge is defined and constructed. It is important to gather the user's desires and needs, understanding the reasons behind them (insights). For this stage, tools such as mind maps are used to help organize the information we have obtained. This is a graphical tool that allows us to visualize various concepts in an orderly manner. It also allows the use of drawings and shapes that are attractive to the person creating them. Another tool is called "Outside Inside," which allows you to select or choose between different pieces of information, enabling you to converge by creating a framework between what is useful and what is not useful for developing a project. You can use saturation and grouping tools, the Ishikawa diagram, the 2 x 2 matrix, and the mood board.

Stage 3: Ideate

In this stage, possible solutions are considered, and some challenges can be incorporated, such as creativity games that seek to provide solutions to the need identified. Prototypes are selected based on criteria defined in advance by the "designers" (members of the work team), considering factors such as technical and economic feasibility and user acceptance. One of the great achievements of Design Thinking is raising awareness about how to understand the problem well to find solutions. Once the challenge or problem has been understood and defined, it is time to generate ideas. This is when creativity and the goal of solving the problem come into play. Many tools can be used to help us generate ideas. Examples include brainwriting

and SCAMPER. Brainwriting and brainstorming are tools that allow students to represent their ideas through writing. The SCAMPER technique develops the brainstorming process. This technique is used in groups and responds to the idea of solutions for a specific challenge.

Stage 4: Prototyping

At this stage, the ideas that were presented will be grounded and seen if they are tangible to carry out. It is at this point that we talk about real proposals, which are no longer imaginary. This is one of the main stages, as there is a convergence between all the ideas presented, and we will see which one can be built, but in different ways. The prototype is a quick and inexpensive test of what we want to show. The subject executes to think; it is not necessary for the designed object to have all the desired functionalities, as these characteristics will be incorporated as the process progresses. For this stage, we can use various tools, including inexpensive and quick ones, as well as more expensive ones that require more time. Some of these tools are role-playing, product or service plans, brochures, screenshots, and storyboards. For example, through the storyboard, the details we want to represent will be highlighted through a general visualization of a story. To facilitate understanding of what is being designed, essential details will be considered and, based on feedback received from peers or agents external to the project, it will be determined whether this path is coherent or in which areas the proposal should be enriched or modified. Another tool that can be used at this stage and that helps in the prototyping stage is the creation of a video, which, despite being somewhat costly, requires time for its production and editing.

Stage 5: Validate

This is the last and fifth phase of this process. Here, the user is shown what has been designed for them. At this stage, not only is the final product shown to the customer, but a process of listening and conversation is developed in an empathetic manner to make strategic decisions. It is important to consider the feedback received from the user to see if the solution presented corresponds to the needs and desires, they presented at the beginning of the process. At this meeting, it is important to prepare the preliminary phases that were worked on throughout the methodology, such as empathizing, defining, and ideating. Here, it is useful to have notes and a simplified outline that allows you to quickly see the entire process. When showing the prototype, remember that the user is at the center of the process and take note of their feedback on the work done.

The feedback received from the user will allow for three possible scenarios: start production, iterate (which is the most common), or abandon the process.

Before obtaining the subject's final validation, some questions that can help us reflect on the product shown are: Which part of the process should we return to? What similarities do we find between feedback and what was originally thought? What differences do we find between feedback and what was originally thought? Validating also means listening, observing, and considering various questions. Therefore, the correct collection

and interpretation of feedback from the person in the Design Thinking process will be considered a success.

Schools in the 21st century are based on innovation and creativity at different educational levels, promoting continuous improvement to transform reality. The educational community can question the reality that surrounds it, thus fostering critical thinking, creativity, and confidence. Through this, we can transform reality, solve problems, and generate solutions. Design Thinking is a creative act and allows teachers to understand that creating an effective learning environment is both a reflective and intentional act. Teachers are the designers and redesigns of school systems and schools (they are design thinkers). "The combination of interaction with music, lyrics, and interactive exercises through the app is beneficial for improving students' language skills" (Huang & Chen, 2024, p. 539).

From a theoretical perspective, this study contributes to knowledge about the effectiveness of an educational program based on the active Design Thinking methodology, implemented in person, in English language learning within Regular Basic Education, specifically at the primary level of a public school.

According to the research, there is very little information on studies with the same characteristics in the target population. This will allow recommendations to be made and the scope to be broadened to achieve progress in this area. Furthermore, the significance of this study lies in the fact that it allows the key principles for determining English language learning (skills, abilities, and performance) to be systematized, unified, and adapted within a new curriculum proposal.

In terms of practical relevance, the aim is to provide teachers with knowledge on how to apply one of the most innovative methodologies Design Thinking and the use of information technologies together with various dimensions of formative assessment as a strategy for achieving essential competencies. Likewise, participating schools would serve as pilot institutions in the use of this methodology so that it can later be replicated in other contexts, depending on the results obtained.

At the same time, this research seeks to fill a gap identified in the literature. While previous studies have examined the use of Design Thinking in secondary or higher education contexts, there is a clear lack of systematic research on its application in primary education, particularly in relation to the development of English language skills in post-pandemic contexts. By focusing on this population, the study not only offers an innovative educational program that integrates active methodologies, technology, and formative assessment, but also contributes theoretically by expanding the understanding of how Design Thinking can be adapted to early stages of second language acquisition. Thus, the study provides both a practical tool for curriculum planning and teaching, and a theoretical contribution to ongoing discussions on the intersection of SLA, active methodologies, and innovative program design.

For all the reasons explained above, this research aims to evaluate the impact of an educational program based on the design thinking methodology on English language learning.

Experimental Educational Program Based on Design Thinking to Enhance English Learning

The experimental program implemented in this study aimed to strengthen English language learning in fourth-grade primary students through the Design Thinking methodology. Its design followed the stages proposed by Bisquerra (2022), including initial diagnosis, objective setting, activity planning, implementation, formative and summative evaluation, and adaptations according to students' needs. The program consisted of eight thematic units, distributed over 48 learning sessions, with a daily frequency of two hours per session, over a period of four months. Each unit incorporated active methodologies, such as Project-Based Learning, collaborative activities, and real-life simulations, with the purpose of developing communicative competencies and enhancing oral and written interaction in meaningful contexts (Milne Lawrie, 2024).

During implementation, students engaged in practical activities, including role-plays, dramatizations, writing tasks, and conversation workshops, integrating digital tools and educational applications to reinforce learning in a dynamic way (Fernández Cueto, 2024). Attention to diversity was ensured through differentiated strategies tailored to various learning styles and paces, while evaluation was continuous and formative, providing ongoing feedback to adjust teaching strategies based on individual and group progress (García Rodríguez, 2024; Pérez Cárdenas, 2024). In addition, follow-up mechanisms were established to ensure the sustainability of learning, promoting autonomous practice and participation in complementary activities that consolidated the linguistic competencies acquired throughout the program.

The educational program is based on the Design Thinking methodology, focused on creative development and problem-solving through five stages: empathy, definition of key concepts, idea generation, prototyping, and validation of solutions that students materialize and share with their peers. Its application to English language learning is carried out by adapting the task-based approach of the Common European Framework of Reference for Languages and the national curriculum, ensuring contextualized and meaningful learning. The program establishes four specific competencies aimed at enabling fourth-grade students to achieve level A1, strengthening their communicative skills and promoting the integration of innovative and creative strategies in the English teaching-learning process. The competencies are detailed below.

Table 1
Competencies and skills of the educational program

Competencies	Skills
1. Understands information about everyday events in English as a foreign language through oral texts, demonstrating an attitude of active listening to interact with their environment. (Listening)	1.1. Obtains and relates specific information from spoken English texts.
	1.2. Understands information obtained from spoken texts to complete data with the help of context.
	1.3. Interprets and evaluates specific information obtained from spoken texts with the help of images to find correspondences or mark the correct answer.
	1.4. Analyses information obtained from spoken texts to respond to different instructions with the help of context.
2. Read short texts written in English as a foreign language to identify and understand main and secondary ideas while maintaining an objective and accurate position. (Reading)	2.1. Identify and relate key information from short written texts to labelled images.
	2.2. Identify and choose the most logical response to continue a written dialogue.
	2.3. Identify specific information and main ideas from a short text to fill in blanks and choose the most appropriate title.
3. Writes texts in English as a foreign language following the linguistic norms of the target language in a responsible manner to communicate their ideas. (Writing)	3.1. Write syntactically appropriate words using correct spelling to complete a text.
	3.2. Complete sentences with two- or three-word phrases using a text with images as a reference.
	3.3. Complete sentences using an image as a reference.
	3.4 Answer questions using an image as a reference.
	3.5. Write sentences using an image as a reference.
4. Express specific ideas to communicate in English as a foreign language, respecting the linguistic norms of the target language. (Speaking)	4.1. Describe differences between images by identifying color, size, number, position, appearance of people, and actions.
	4.2. Complete a story orally using images.
	4.3. Explain orally why an image does not correspond to a given set.
	4.4 Answer questions to obtain personal information.

Note. Based on the proposal of the Common European Framework of Reference for Languages (2020) and the Peruvian national curriculum (2016), as well as the Taxonomy of Skills and Performance published by the Ministry of Education (2020).

METHOD

This study followed a quantitative approach and was applied in nature, as it employed scientific methods with the aim of solving specific problems and generating solutions that could be implemented in real-life situations. The design was pre-experimental, with a single group, which is appropriate for an initial approach to the research problem in a real-life context. Observations were made at two different points in time: before the treatment was applied and after its implementation.

The population consisted of a total of 125 fourth-grade students between the ages of 9 and 10 from a public educational institution. A non-probabilistic sampling method was used to determine a sample of 68 students. The inclusion criteria considered students enrolled in fourth grade who had the consent of their parents and/or guardians to

participate in the program. Exclusion criteria included students with more than 30% absenteeism from learning sessions and those with cognitive disabilities.

In the first stage of the study, a diagnostic test was administered to participating students to identify their initial level of English. The instrument used was an official sample test for level A1 Movers, taken from the document Young Learners Sample Papers 2018 – Volume 1, published by Cambridge Assessment English. This test assesses the four language skills: listening comprehension, speaking, reading, and writing. As stated in the official document: "These sample papers are designed to help teachers and candidates familiarize themselves with the format of the test and the types of tasks it includes." (Cambridge Assessment English, 2018, p. 2).

The test was used exclusively for educational and training purposes, being administered as a pre-test to obtain a baseline of student performance. Subsequently, during the implementation of the educational program, systematic observation and formative assessment techniques were implemented through rubrics, checklists, observation guides, and portfolios, with an emphasis on formative assessment. Finally, the same test was reapplied as a post-test to compare the initial and results and assess the learning achieved at the end of the pedagogical intervention.

Quantitative analysis techniques were used for this research, employing descriptive and inferential statistics with SPSS version 26 software. First, the database was constructed and refined according to the inclusion and exclusion criteria. Then, normality tests (Kolmogorov-Smirnov and Shapiro-Wilk) were applied to determine the type of statistical test to be used. Based on the results, the student's t-test for paired samples was applied to the general hypothesis, and the Wilcoxon test was applied to the specific hypotheses, as some dimensions did not have a normal distribution.

During the intervention, formative assessment was applied using rubrics, checklists, and observation guides developed by the author, aligned with the National Curriculum and the Common European Framework of Reference for Languages (CEFR). In addition, a sample test based on the official format of the Cambridge A1 Movers exam was used as a pretest and posttest, evaluated using a rubric constructed based on the criteria of Cambridge Assessment English.

This study adhered to the fundamental ethical principles of educational research, in accordance with national and international standards. As the sample consisted of underage students in the fourth grade of a public school in Lima, specific measures were taken to ensure their protection and well-being. Before the program began, an informational meeting was held with the parents, where the nature of the study, its objectives, the procedures to be carried out, and the educational purpose of the program were explained in detail. Subsequently, written informed consent was obtained from the parents, emphasizing that participation was completely voluntary and that they could withdraw their authorization at any time without consequences. Likewise, formal permission was obtained from the educational institution to carry out the program and collect data. Throughout the process, data confidentiality was maintained through coding, and the emotional, physical, and academic well-being of the students was ensured.

FINDINGS

To carry out the study, before starting the application of the educational program, the instrument called MOVERS A1 standardized test was administered as pretest and posttest to the sample of students (N = 68) members of the experimental group in order to measure their level of English language proficiency using an equidistant scale (AD, outstanding achievement, A, expected achievement, B, in process or C, at the beginning) according to the rating scale in the evaluation of learning (MINEDU, 2020).

Table 2
Results of the listening comprehension dimension in pretest and post test

Levels	Experimental Pretest		Experimental Postest	
	Frequency	%	Frequency	%
Start	56	82,4	8	11,8
In process	12	17,6	18	26,5
Expected achievement	0	0	27	39,7
Outstanding achievement	0	0	15	22,1
Total	68	100,0	68	100,0

In the pre-test, most of the students were at the "Beginning" level in listening comprehension proficiency. Only 12 students (17.6%) reached the "In progress" level, and none reached the expected or outstanding achievement levels. In the post-test, a significant improvement was observed. The number of students at the "Beginning" level was reduced to 8 (11.8 %), while 18 students (26.5 %) reached the "In progress" level. In addition, 27 students (39.7 %) reached the "Expected Achievement" level, and 15 (22.1 %) reached "Outstanding Achievement". In total, 42 students (61.8%) achieved satisfactory performance in listening comprehension.

Table 3
Results in the reading comprehension dimension in pretest and post test

Levels	Experimental Pretest		Experimental Postest	
	Frequency	%	Frequency	%
Start	62	91,2	3	4,4
In process	6	8,8	12	17,6
Expected achievement	0	0	19	27,9
Outstanding achievement	0	0	34	50,0
Total	68	100,0	68	100,0

In the pre-test, most of the students were at the "Beginning" level in reading comprehension proficiency, indicating that they had difficulties in understanding English texts. Only 6 students (8.8%) reached the "In Progress" level, and none reached the "Expected Achievement" or "Outstanding Achievement" levels. In the post-test, a significant improvement was evident. The number of students at the "Beginning" level was reduced to 3 (4.4 %), while 12 (17.6 %) reached the "In progress" level. In addition, 19 students (27.9 %) reached the "Expected Achievement" level and 34 (50.0 %) reached "Outstanding Achievement". In total, 77.9% of the students achieved satisfactory performance in reading comprehension, demonstrating the positive impact of the program.

Table 4
Results in the written expression dimension in pretest and post test

Levels	Experimental Pretest		Experimental Postest	
	Frequency	%	Frequency	%
Start	46	67,6	31	45,6
In process	20	29,4	25	36,8
Expected achievement	2	2,9	12	17,6
Outstanding achievement	0	0	0	0
Total	68	100,0	68	100,0

In the pre-test, 67.6% of the students were at the "Beginning" level in the written expression competency, indicating that they had difficulty expressing ideas in English. Only 20 students (29.4 %) reached the "In progress" level, and none reached the "Expected achievement" or "Outstanding achievement" levels. In the post-test, the percentage of students at the "Beginning" level dropped to 45.6 %, while 25 students (36.8 %) reached the "In Process" level. In addition, 12 students (17.6 %) reached the "Expected Achievement" level, although none reached "Outstanding Achievement". In total, 54.4% of the students managed to improve their performance in written expression, showing progress with respect to the initial evaluation.

Table 5
Results in the oral expression dimension in pretest and post test

Levels	Experimental Pretest		Experimental Postest	
	Frequency	%	Frequency	%
Start	0	0	1	1,5
In process	0	0	14	20,6
Expected achievement	0	0	19	27,9
Outstanding achievement	0	0	34	50,0
Total	68	100,0	68	100,0

In the pretest, no student responded correctly in the oral expression competency. In the posttest, only 1 student (1.5 %) remained at the "Beginning" level, while 14 (20.6 %) reached "In progress", managing to communicate with incomplete but understandable sentences. In addition, 19 students (27.9 %) reached the "Expected Achievement" level, responding with short and coherent sentences, and 34 (50.0 %) achieved "Outstanding Achievement", expressing themselves with fluency, coherence and greater length.

Table 6
Descriptive results of the pretest

Pre Experimental pretest					
Dimensions	N	Mínimo	Máximo	Media	Desviación estándar
D1_PRE	68	0	10	3,88	2,46
D2_PRE	68	0	7	1,54	1,86
D3_PRE	68	0	12	4,04	3,16
D4_PRE	68	0	0	0	0
VT_PRE	68		19	7,93	4,46

Table 6 shows the descriptive results of the pretest in the experimental group where dimension 3 Written expression shows the best results with respect to the other

dimensions with an average score of 4.04, with a standard deviation of 3.16, with a minimum score of 0 and a maximum of 12. Furthermore, in dimension 4 no results were obtained in the pretest and finally the average pretest score was 7.93 with a standard deviation of 4.4, and scores ranging from 0 to 19.

Table 7
Descriptive results of the post-test

Experimental postest					
Dimensions	N	Mínimo	Máximo	Media	Desviación estándar
D1_POS	68	0	24	13,79	5,91
D2_POS	68	0	17	11,44	3,90
D3_POS	68	0	13	6,01	3,94
D4_POS	68	12	52	35,53	13,21
VT_POS	68		104	66,78	20,85

Table 7 presents the descriptive results of the posttest in the experimental group, where dimension 4 Oral expression shows the best results with an average score of 35.53 and a standard deviation of 13.21, with values between 12 and 52. In addition, dimension 3 Written expression obtained an average score of 6.01 with a standard deviation of 3.94, while dimension 1 (Listening comprehension) registered an average score of 13.79 with a standard deviation of 5.91. Finally, the mean post-test score was 66.78 with a standard deviation of 20.85, and scores ranging from 0 to 104.

Table 8
Paired sample statistics

	Mean	N	Standard deviation	t-statistic	Sig.
VT_PRE	7,93	68	4,456	-24,696	< .001
VT_POS	66,78	68	20,846		

In the pretest the mean was 7.93 while in the posttest the mean was 66.78. The standard deviation is 4.456 for the pretest and 20.846 for the posttest. The test statistic (p value) was < .001 showing that the program was effective.

DISCUSSION

The findings of this research confirm that the design thinking methodology had a positive and significant impact on English language learning in elementary students, particularly in oral comprehension and production. This is consistent with constructivist perspectives such as Vygotsky's sociocultural theory, which highlights the role of social interaction and collaboration in knowledge construction (Vygotsky, 1978), and Ausubel's (1968) meaningful learning theory, which emphasizes the importance of linking new information with prior experiences. The integration of design thinking allowed students to learn English by solving contextualized problems, fostering meaningful and functional use of the language.

When contrasted with other innovative methodologies, the results suggest that design thinking can be more effective for consolidating communicative skills. For example, Rojas and Olortegui (2020) used didactic games to reinforce oral expression in English, obtaining improvements in vocabulary and fluency, although mainly limited to the oral

dimension. Similarly, Aguilar et al. (2020) applied gamification in Ecuador, which increased student motivation but showed limited gains in proficiency. In comparison, design thinking in the present study not only enhanced motivation but also produced measurable progress in comprehension and production, indicating that methodologies rooted in problem-solving and collaborative creativity may generate deeper language learning outcomes.

Other studies confirm the communicative benefits of design thinking. Cleminson and Cowie (2021) found that design thinking fostered creativity and teamwork in English learning, though their sample consisted of university students with A2 level, who still tended to rely on their first language. In contrast, the elementary students in this study achieved progress in oral and written skills while adhering to linguistic norms, suggesting that younger learners may benefit more from design thinking when guided with structured tasks. Likewise, Pérez (2023) reported that design thinking increased oral expression in primary school students, with significant improvements in fluency and confidence, results that align closely with those obtained here.

The findings also resonate with cooperative approaches. Reátegui (2020), for example, demonstrated that cooperative learning improved reading comprehension in English, highlighting the importance of peer interaction. However, while cooperative learning emphasizes interdependence, design thinking integrates creativity and problem-solving, offering a more holistic pathway to developing communicative skills. Barona (2021) further supports this by showing that design thinking promotes collaboration and participation, which, as in this study, translated into gains in listening and speaking comprehension.

Recent evidence also supports the versatility of design thinking in primary education. He et al. (2023) showed that design thinking-based activities enhanced creative self-efficacy and interest in STEM subjects in fifth graders, while Liu (2024) found that design thinking fostered creativity and collaborative learning in elementary schools. These findings coincide with the results of the present study, where English learners benefited from teamwork, idea generation, and iterative learning. Nevertheless, a meta-analytic review by Yu, Yu & Lin (2024) revealed that the impact of design thinking is stronger when directly compared to traditional methods, and that in elementary education its effects tend to be moderate unless supported by curriculum integration and teacher training.

Taken together, the evidence suggests that design thinking is an effective methodology to strengthen English language learning in primary education, but its impact is not homogeneous. The presence of outliers in this study shows that some students benefited more than others, consistent with Ahumada and Mauricio's (2022) findings in remote education contexts, where fluency gains were uneven. Future research should therefore compare design thinking directly with traditional and alternative methodologies, such as gamification, cooperative learning, or project-based learning, to determine the specific advantages and limitations of each approach.

Among the limitations of the study, we acknowledge the use of a pre-experimental design with a single group, which reduces control over possible threats to internal validity. Future research could implement quasi-experimental or experimental designs to strengthen the evidence and generalization of the findings

CONCLUSION

The application of the design thinking methodology had a positive and significant impact on English language learning in fourth-grade primary students, particularly in oral comprehension and production, demonstrating its potential as an innovative pedagogical strategy in basic education.

The results aligned with recent research highlighting the effectiveness of design thinking in fostering motivation, creativity, and collaborative learning, reinforcing its relevance in public educational contexts where active and contextualized methodologies are needed.

Despite its benefits, the impact of design thinking was not uniform across all students, suggesting the need for complementary teacher training, curriculum adaptation, and future studies comparing its effects with other innovative and traditional teaching methodologies.

SUGGESTION

Future research should implement comparative studies that evaluate the effects of design thinking alongside other innovative and traditional teaching methodologies, such as gamification, project-based learning, and cooperative learning, in primary education settings. This would allow for a more precise identification of the specific pedagogical advantages and limitations of each approach. Additionally, longitudinal designs should be considered to assess the sustainability of learning gains over time, while incorporating differentiated instruction strategies and structured teacher support to ensure that all students benefit equitably from the intervention.

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