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JIGSAW AND COOPERATIVE LEARNING IN ENGLISH LANGUAGE LEARNERS FROM A UNIVERSITY IN THE CITY OF BARRANCA, 2022

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ABSTRACT

The objective of this study was to analyze the influence of the Jigsaw didactic strategy on the cooperative learning of English language learners at a university located in the city of Barranca, Peru. A quantitative approach was developed and applied through research with a quasi-experimental cross-sectional design, which included an experimental group and a control group, made up of a total of 60 students. The data collection process involved the administration of a 20-item Likert questionnaire, which was subjected to validation through expert judgment and demonstrated a high degree of reliability ($\alpha = 0.98$). The inferential analysis was executed using the Mann–Whitney U test, which revealed statistically significant disparities between the groups in the post-test ($p < 0.001$; $Z = -3.316$), in favor of the experimental group. Significant advancements were identified in the social, innovative, and proactive dimensions of cooperative learning. The findings indicate that the implementation of the Jigsaw teaching strategy has a favorable and substantial impact on the collaborative learning of university students of the English language. This strategy serves as an effective pedagogical alternative, promoting interaction, active participation, and collaborative work in higher education settings.

KEYWORDS: Cooperative learning, Jigsaw strategy, English language teaching, Higher education, Active methodologies.

1. INTRODUCTION

The pedagogy of English as a foreign language has undergone a continuous evolution in response to the social, cultural, and educational transformations that have given rise to contemporary teaching models. English learning, in its early stages—particularly during the 1950s—was predicated on conventional pedagogical approaches that placed a premium on direct interpretation from a foreign language to a native language, with an emphasis on discrete reading and writing exercises. This approach led to a substantial decrease in interaction between students, thereby limiting opportunities for authentic communication and adversely affecting the development of social and collaborative skills in the classroom environment.

The advent of the audio-lingual method engendered a pedagogical paradigm shift, whereby the instruction of English adopted a rigid and repetitive structure. In this method, students adopted a quasi-passive posture, focusing on listening, mechanical repetition, and memorizing already established grammatical rules. While this approach yielded enhancements in pronunciation and grammar, it fell short of fostering fluent and spontaneous communication, thus constraining its practical application in authentic interaction scenarios.

Not until the 1980s, however, did a significant shift occur in the pedagogy of English, marked by an emphasis on communicative methods that placed student interaction at the forefront of the learning process. This methodological transformation enabled the recognition of the student as an active participant in the creation of their own knowledge, thereby fostering the exchange of thoughts, the negotiation of meanings, and teamwork in the classroom. However, despite this progress, several studies have demonstrated that there are still nations with low levels of English proficiency, a situation that is directly related to the pedagogical methodologies employed in educational institutions and the persistence of traditional approaches that are not very participatory.

A review of the extant literature on educational practice reveals a persistent tendency in university English teaching to rely on teacher-centered models that restrict students' involvement beyond the reception of information. This pedagogical approach has the unintended consequence of diminishing opportunities for active participation, critical reflection, and collaboration among peers, which are indispensable elements for meaningful foreign language learning. Consequently, there is an evident necessity to reevaluate the methodologies employed in the classroom, with the objective of adapting to the current demands of higher education, which seeks the comprehensive development of the student.

The acquisition of a language entails the cultivation of a sophisticated ability that necessitates ongoing practice, substantial exposure, and engaged student participation. A multitude of studies have demonstrated that the time allocated to learning and consistent language practice exerts a direct influence on the acquisition of communicative skills. This enables students to enhance their competencies in reading comprehension, written expression, listening comprehension, and oral production. Consequently, the acquisition of English should not be confined to the mere transmission of theoretical information; rather, it should foster dynamic educational experiences that facilitate interaction and the authentic use of the language.

In such circumstances, the role of the English teacher becomes pivotal, as they are responsible for designing and implementing instructional strategies that encourage active engagement, motivation, and dedication on the part of students in their own learning process. The creation of innovative and student-centered didactic sessions has become an educational necessity, with the objective of generating relevant learning and transforming the classroom into an environment of interaction, collaboration, and joint construction of knowledge.

In this framework, teamwork is presented as a fundamental pedagogical strategy that reinforces the teaching and learning of the English language. Group teaching has been demonstrated to promote co-responsibility, positive interdependence, and the development of social skills, thus allowing students to learn not only individually, but also through interaction with their peers. Consequently, team learning fosters an optimal educational environment, characterized by effective communication, mutual respect, and the active engagement of all group members.

Consequently, the pedagogy of the English language necessitates the implementation of active methodologies that facilitate comprehensive learning, integrating cognitive, social, and emotional dimensions. In this context, teachers must adopt a reflective and committed posture, focused on the continuous improvement of their pedagogical work and on the search for innovative strategies that respond to the needs of students and the requirements of the contemporary educational environment.

From this perspective, the study aims at the

analysis of the Jigsaw didactic strategy as a methodological option to strengthen collaborative learning in English language teaching. Orosz (2018) posits that Jigsaw is a pedagogical technique that fosters dynamic and meaningful learning. In this approach, students adopt an active and responsible role not only in their own learning but also in the learning of their peers. In a similar vein, this strategy has been shown to promote collective knowledge construction, expand vocabulary, and cultivate shared responsibility for achieving common goals, thereby enhancing interpersonal skills (Aronson & Patnoe, 2011).

The problem exposed highlights the need to systematically investigate the impact of the implementation of the Jigsaw didactic strategy on the collaborative learning of the English language. It is imperative to comprehend the way this strategy impacts the cultivation of collaborative competencies. This comprehension will facilitate the generation of empirical evidence, which will, in turn, contribute to the enhancement of pedagogical practices within the university environment. In this context, the following general problem was formulated: The study seeks to examine the impact of the Jigsaw didactic strategy on the collaborative learning of English learners at a university in Barranca, 2022.

From a justificatory perspective, the research has a theoretical value by contributing to new understandings about the use of Jigsaw and its link with collaborative learning during the teaching of English. From a methodological perspective, the study's significance lies in its adoption of a quantitative approach, which enables objective analysis of the strategy's impact and the generation of generalizable results. In the practical field, the results will allow for the detection of both the strengths and weaknesses in the use of Jigsaw, thereby providing guidelines for its correct implementation in the classroom. The social importance of study is ultimately rooted in its contribution to enhancing the teaching-learning process, thereby promoting relevant learning that aligns with the educational demands of the university environment.

In accordance with the primary objective of the study was to ascertain the way the Jigsaw educational strategy influences the collaborative learning of English learners at a university in Barranca in 2022. The specific objectives of the study included the analysis of the impact of this strategy in its social, innovative, and proactive dimensions. A general hypothesis was proposed, positing that the implementation of the Jigsaw strategy exerts a substantial influence on students' collaborative learning. This general hypothesis is complemented by specific hypotheses pertaining to each of the strategy's dimensions.

2. THEORETICAL FRAMEWORK

2.1. Research background

Research conducted at the national level on the use of cooperative strategies in English teaching is still scarce; however, the available studies show significant results that support the relevance of this work. In this context, Mamani (2016) sought to evaluate the efficacy of the Jigsaw method as a strategy to enhance oral expression in English among university students. A quasi-experimental design was employed to examine the effects of cooperative learning on students' communication skills. The study, which involved 307 students, found that cooperative learning significantly improved not only verbal fluency but also the organized writing of texts. These findings underscore the importance of cooperative learning in developing comprehensive communication skills.

In a similar vein, Anticona (2016) examined the impact of the Jigsaw method on the academic performance of university students, employing a quasi-experimental design with a sample size of 60 participants. The findings indicated a substantial advancement in knowledge subsequent to the implementation of the strategy, thereby enabling the conclusion that collaborative efforts, when meticulously orchestrated, enhance academic performance and catalyze effective problem solving in the classroom environment.

Conversely, Patiño (2017) examined the repercussions of cooperative learning on the development of group skills and conflict management among students in the initial cycle of higher education. Applying a quasi-experimental approach, it was ascertained that the implementation of the Jigsaw method significantly enhances social skills, thereby facilitating favorable interaction, joint decision-making, and collaborative conflict resolution. These skills are deemed essential for both academic and professional performance.

In a similar vein, Munayco (2017) examined the impact of cooperative strategies on English reading comprehension, employing a quantitative approach with a quasi-experimental design. The findings of the study indicated that the implementation of cooperative methodologies has a significant impact on the development of reading comprehension, underscoring the need to implement active strategies in the teaching of foreign languages.

In regard to the motivational aspect, Cuadros et al. (2018) conducted a descriptive study with higher education students, revealing that levels of motivation to learn English increase as the academic level progresses. This finding underscores the significance of employing methodologies that promote active engagement and sustained interest among students. In a similar vein, Lanza et al. (2016) demonstrated that cooperative learning exerts a positive effect on oral expression across all levels of learning, underscoring its efficacy as a didactic strategy to enhance oral communication.

At the international level, Cruz et al. (2016) demonstrated that the implementation of the Jigsaw strategy significantly enhances oral production in English, thereby promoting collaborative and interactive learning that strengthens communication skills. Furthermore, Salas (2016) emphasized that collaborative experiences among university students engender elevated levels of motivation, thereby fostering dynamic work groups that are dedicated to their learning.

Torres (2017) presented evidence on the incorporation of information and communication technologies in cooperative approaches, showing important improvements in English language learning. In a similar vein, Orosz et al. (2018) underscored the significance of active learning, asserting that methodologies such as Jigsaw facilitate the development of reading and oral communication competencies through role allocation and knowledge dissemination.

Caraballo and his team (2020) and Brito et al. (2021) ultimately concurred that the implementation of cooperative and innovative strategies fosters critical thinking, group dynamics, and formative assessment—essential competencies for the university environment and the contemporary labor market.

2.2. Epistemological and theoretical foundations

From an epistemological perspective, this study is rooted in the positivist paradigm, which conceptualizes scientific knowledge as an objective that can be empirically evaluated and measured. This approach posits that educational phenomena can be studied using rigorous scientific methods, thereby enabling the formulation and testing of hypotheses that elucidate the educational reality.

Constructivism, on the other hand, offers an alternative viewpoint by emphasizing that learning is an active process of knowledge creation. According to Krahenbuhl (2016), cooperative learning is an unconventional model that considers the skills, abilities, values, culture, language, and emotions of the student, promoting active participation in the creation of knowledge. In this same vein, Djamane (2016) conceptualizes learning as a continuous social process of construction and reflection.

According to Monereo (2017), the cooperative learning model, as theorized within the framework of sociocultural theory, fosters cognitive and social development through the interaction among students. This interaction enables students to collaboratively address challenges, thereby acquiring and developing social and cognitive skills that contribute to their individual and collective growth.

2.3. Jigsaw Teaching Strategy

The Jigsaw didactic strategy is a cooperative learning approach developed by Aronson (1980). In this strategy, each member of the group is responsible for a specific section of the content. These sections are then shared with the team to create a final product. This approach fosters equitable participation, positive interdependence, and individual responsibility within the group.

Aronson and Patnoe (2011) posit that Jigsaw fosters mutual respect, empathy, and collaboration, thereby preventing conflicts and enhancing the classroom environment. The implementation of this pedagogical approach necessitates the division of content into distinct sections, the allocation of roles, the execution of individual tasks, and the dissemination of knowledge. This sequence of activities is conducive to the attainment of meaningful learning outcomes and a more profound comprehension of the subject matter.

The advantages of Jigsaw include the reinforcement of collaborative work, the development of social skills, the increase in motivation, creativity, and the ability to express verbal expression, as well as cooperative problem solving.

2.4. Collaborative learning

Collaborative learning is regarded as an active methodology that fosters collaboration and shared responsibility in the acquisition of knowledge. This pedagogical approach empowers students to assume responsibility for their own learning processes and those of their peers, thereby fostering positive interdependence and enriching interaction.

The program's notable attributes encompass the cultivation of communication aptitudes, the fortification of interpersonal connections, and the establishment of a conducive learning atmosphere. According to León et al. (2015), cooperative work has been shown to reinforce communication, solidarity,

and collective commitment. These elements are considered fundamental for meaningful learning in higher education.

The role of the teacher is of paramount importance in the implementation of collaborative learning models. Teachers are tasked with the responsibility of designing activities, ensuring equitable participation, and recognizing the contributions of both individual and group efforts. They play a pivotal role in facilitating the effective functioning of teams.

2.5. Dimensions of the Jigsaw technique and collaborative learning

The Jigsaw technique is comprised of three primary dimensions. The social dimension has been shown to promote personal growth, equity, and social dialogue, facilitating the expression of ideas, negotiation, and conflict resolution (López et al., 2017; Martínez & Benítez, 2016). The innovative dimension has been shown to stimulate adaptability, creativity, and critical thinking, thereby encouraging active and reflective student participation (Martínez & Benítez, 2016). Finally, the proactive dimension reinforces the division of labor, joint assessment, and group feedback, allowing the student to identify their skills and adapt to developments (Lund & Aballay, 2020).

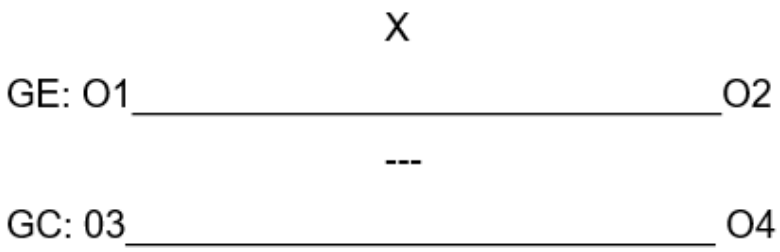
Collaborative learning, in turn, incorporates aspects such as individual and collective responsibility, stimulating interaction, and communicative and social competencies, which are essential to achieve common goals and enhance academic performance (Suárez, 2004; León et al., 2015).

3. METHODOLOGY

3.1 Type and design of research

The study is of an applied nature, as its objective is to disseminate the findings of research that demonstrates the efficacy of a specific pedagogical approach in fostering collaborative learning among English language learners. This approach aims to enhance the teaching and learning process in regard to the language itself. The investigator intends to intervene directly in the study population through the administration of surveys and questionnaires. The collected data will serve as the basis for proposing potential solutions to the research problem (Gallardo, 2017).

3.2. Quasi-experimental design scheme



Figure

Where:
GE: Experimental Group
GC: Control Group
O1: Entrance test applied to the experimental group
O3: Entry test applied to the control group
O2: Exit test applied to the experimental group
O4: Exit test applied to the control group
X: Treatment with the independent variable
---: Traditional Strategy

It is an applied type of research, experimental design and quasi-experimental sub-design, having as a study group 60 students divided into an experimental and a control group, which will determine the influence of the independent cooperative learning variable with respect to the dependent Jigsaw variable through the application of the pre-test and post-test.

3.3. Variable and operationalization

Conceptual definition: Jigsaw (independent variable) is a didactic strategy that allows students to create interactive and meaningful learning, for which they need to actively participate in their learning and that of their peers in order to foster responsibility to improve their interpersonal skills (Orosz et al. 2018). On the other hand, cooperative learning (dependent variable) is a form of active learning that allows the implementation of group activities that encourage the student to develop in an environment of reciprocal cooperation (West, 2018).

Operational definition: the Jigsaw didactic strategy (independent variable) has the social dimension that helps to express opinions, improves negotiation and conflict resolution among classmates. The innovation dimension is an alternative to improve training deficiencies among students, turning them into active, participative people with

critical and reflective capacity. The proactivity dimension that allows the student to become aware of their strengths and weaknesses, making them able to adapt easily to change, allowing them to face failure as an opportunity for learning and knowledge. (Martínez & Benítez, 2016).

Indicators: personal development, equality and social dialogue, flexibility and originality, division of labor, joint evaluation and team feedback.

Measurement scale: Ordinal

3.4. Population, sample and sampling

The total student population of the language center was made up of 150 students. As indicated by Carrillo et al. (2020), the population is defined as a set of components that manifest a common characteristic that is the subject of study.

3.4.1. Sample

The sample consisted of 60 students, divided into two research groups: control and experimental. In this sense, the researcher worked with different groups to then intentionally select the final subjects, which will allow to have adequate amounts of subjects from each final sample.

3.4.2. Sampling

The type of sample was non-probabilistic, intentional or convenience, considering that each unit of analysis does not have the same probability of participating in the sample, it depends on certain characteristics of the research (Hernández & Mendoza, 2018).

3.5. Data collection techniques and instruments

The technique applied was the survey. According to Ponce and Pasco (2015), the objective of this technique is to obtain information regarding a segment of the population or a sample through the implementation of interviews or questionnaires.

The questionnaire was used as an instrument, constituting a structured collection of questions designed to elicit information regarding the variables under investigation. This instrument can be administered either individually or collectively through digital means and must be pertinent to the variables and their respective indicators, as outlined by Ponce and Pasco in 2015.

The instrument was developed by the researcher this year with the purpose of measuring cooperative learning (dependent variable) in English language students from a university in the city of Barranca. The measurement instrument in question comprised 20 items, each addressing a distinct dimension. The presence of individual and team responsibility is indicated by the following indicators: The following proposal is submitted in order to organize a series of events focused on the promotion of positive interdependence and positive interrelation. The objective of these events is to stimulate interaction, the indicators of which are as follows: Active engagement, the application of acquired knowledge, the facilitation of peer participation, and the execution of work with enthusiasm, coupled with effective communication and social skills, serve as key indicators. The formation of cooperative groups among students has been demonstrated to be conducive to the development of mutual assistance behaviors. Furthermore, the development of affective skills has been shown to be a byproduct of these cooperative groups. Finally, the management of emotions and behaviors has been identified as an outcome of the formation of these groups. The measurement levels were subsequently categorized into three distinct categories: initiation, process, and achieved. The application of the instrument was conducted on an individual basis, with each session lasting between 20 and 30 minutes. The study universe encompasses students aged 16 and above. The confidence level of the study is set at 95.0%, and the margin of error has been calculated. The study's findings indicated a 5.0% response rate, with a sample size of 60 English language students from a university in the city of Barranca. The employed technique was of the following type: Survey.

3.5.1. Validity and reliability of instruments

For validity, it was submitted to the judgment of experts, which according to Hernández-Sampieri and Mendoza (2018) is the degree to which a measurement instrument apparently measures the variable in question. The technique of Aiken's "V" validation coefficient was used, whose magnitude ranges from 0 to 1, where 1 indicates a perfect agreement between judges, as a result, the test reached a validity of 0.99. On the other hand, reliability was performed with Cronbach's Alpha, reaching 0.98, which indicates that the instrument is highly reliable.

3.6. Procedure

First, permission was requested from the university's research office, and then from its language center. The request to carry out the study was subsequently accepted. Subsequently, the temporal framework encompassing the application of the pre-test and post-test in the students was meticulously coordinated. The preliminary test, administered individually to both work groups, was designed to assess their abilities and proficiency in the English language. This test comprised 20

questions. The post-test, which was administered individually by both working groups, served as the final evaluation of their English language proficiency. This test encompassed 20 questions designed to assess various aspects of English language ability and proficiency.

The administration of the questionnaire occurred virtually via a Google form. Prior to responding to the questionnaire items, the participants were required to read and accept the informed consent. Subsequent to the application, the data underwent transfer to the Excel program, thereby constructing the data matrix. Subsequently, the data were transferred to the SPSS version 25 statistical program. In order to achieve the objectives set, the results were obtained in tables and graphs using inferential statistics.

3.7. Data Analysis Method

In a first stage, descriptive statistics will be used, where tables and graphs of frequencies will be presented, which will be interpreted and elaborated according to the dimensions and variables.

In the second instance, inferential statistics will be applied for the hypothesis test using the coefficient of Mann Whitney's U, so the instruments are considered to be non-parametric, also the level of measurement is ordinal because the ordinal Likert scale is used.

3.8. Ethical aspects

All scientific research is required to be purpose-driven, with the objective of formulating a study that will benefit humanity. Furthermore, such research must be founded upon fundamental ethical norms. Among these, the Nuremberg Code of Ethics (1947) is particularly noteworthy. It establishes respect for the rights of research participants as a fundamental principle, and it ensures the well-being of the research participants and the research team. The researcher is obligated to adhere to the principles of legality and ethical principles.

Secondly, the World Medical Association (WMA, 2000) promulgated the Declaration of Helsinki, which incorporated novel principles such as the provision of adequate treatment to participants and the establishment of ethics committees to regulate scientific production independently.

Another significant document is the Belmont Report (1979), which delineates the ethical principles that should guide the conduct of every human being throughout all research.

The ethical aspects of the program entail the student's commitment to providing improvements for their learning, whether personal or cooperative. The results were employed judiciously and exclusively for the research study. Consequently, the researcher will adhere to the principles of integrity, justice, and respect for the study participants. Therefore, professionals will adhere to the principles of integrity, proactivity, thoughtfulness, and originality in their work. They will prioritize the protection of individuals in accordance with the deontological and ethical standards that are characteristic of their profession.

4. RESULTS

4.1. Descriptive results

Table 1: Frequencies and percentages of cooperative learning (control and experimental group) according to pre-test and post-test.

	Experimental group				Control group			
	Pre-test		Postest		Pre-test		Postest	
	fi	%	fi	%	fi	%	fi	%
Home	19	63	4	13	19	63	17	57
Process	9	30	22	74	11	34	12	40
Achieved	2	7	4	13	1	3	1	3
Total	30	100	30	100	30	100	30	100

Source: Own elaboration

As illustrated in Table 1, the results of the pre-test administered to the experimental group indicate that cooperative learning was employed by 63% (19) of the students, who were classified as Beginners (n = 19), 30% (9) of whom were classified as Process, and 7% (2) of whom were classified as Achieved. Prior to the administration of the pre-test, the control group was comprised of 63% (19) students in the beginner category, 34% (11) in the process category, and a mere 3% (1) in the achieved category. In contrast, the post-test findings revealed that the implementation of the Jigsaw didactic strategy yielded disparate outcomes between the experimental and control groups. A significant proportion of the experimental group, specifically 13% (4) of the students, remained in the Initiation category, while a higher percentage of 17 students (57%) in the control group persisted in the same category. The experimental group demonstrated notable progress, with 22 students (74%) progressing to the Process category, in contrast to the control group, where only 12 participants (40%) advanced to this stage. Furthermore, the experimental group exhibited a modest increase in the Achieved category, with 4 students (13%)

attaining this level, while the control group showed a negligible increase with only 1 student (3%), suggesting a more pronounced advancement in the experimental group.

Table 2: Frequencies and percentages of the social dimension (control and experimental group) according to pre-test and post-test.

	Experimental group				Control group			
	Pre-test		Postest		Pre-test		Postest	
	fi	%	fi	%	Fi	%	fi	%
Home	22	73	3	9	19	64	16	55
Process	5	18	23	77	10	32	12	41
Achieved	3	9	4	14	1	5	1	5
Total	30	100	30	100	30	100	30	100

Source: Own elaboration

As illustrated in Table 2 of the social dimension, in the Pretest of the experimental group, 73% (22) of the students were classified in the Initiation category, 18% (5) in the Process category, and 9% (3) in the Achieved level. In the preliminary assessment of the control group, 64% (19) of the participants were found to be at the initial level of proficiency, 32% (10) were in the process of achieving this level, and 5% (1) had already attained the level of proficiency. A subsequent evaluation of the post-test results reveals that the experimental and control groups exhibited divergent outcomes. A comparative analysis of the experimental and control groups reveals notable disparities in the distribution of students across categories. In the Initiation category, three students (9%) were observed in the experimental group, while a significant proportion of sixteen participants (55%) were classified in this category within the control group. The Process category exhibited a contrasting trend, with twenty-three students (77%) falling within this category in the experimental group, as compared to twelve students (41%) in the control group. Finally, in the Achieved category, four students (14%) were classified in the experimental group, while only one student (5%) in the control group was categorized in this category.

Table 3: Frequencies and percentages of the innovative dimension (control and experimental group) according to pre-test and post-test.

	Experimental group				Control group			
	Pre-test		Postest		Pre-test		Postest	
	fi	%	fi	%	fi	%	fi	%
Home	22	73	0	0	18	59	16	55
Process	8	27	20	68	12	41	13	45
Achieved	0	0	10	32	0	0	0	0
Total	30	100	30	100	30	100	30	100

Source: Own elaboration

As illustrated in Table 3, the Pretest of the experimental group demonstrates that 73% (22) of the subjects are classified as Beginners, 27% (8) as Process, and the Achieved category is not represented. In contrast, the Pretest of the control group shows 59% (18) in the Beginner category, 41% (12) in the Process category, and once again, the Achieved category is absent. A subsequent evaluation reveals discrepancies between the experimental and control groups' outcomes. Notably, the experimental group lacks participants in the Initiation category, while the Control group contains 16 students (55%) in the Process category. In contrast, the experimental group comprises 20 students (68%) in the same category, and the Control group includes 13 (45%) in the Process category. Finally, the Achieved category includes 10 evaluated students (32%) in the experimental group, while the Control group does not include any participants in this category.

Table 4: Frequencies and percentages of proactive dimension (control and experimental group) according to pre-test and post-test.

	Experimental group				Control group			
	Pre-test		Postest		Pre-test		Postest	
	fi	%	fi	%	Fi	%	fi	%
Home	21	70	0	0	20	68	19	65
Process	8	27	21	70	8	27	9	30
Achieved	1	3	9	30	1	5	1	5
Total	30	100	30	100	30	100	30	100

Source: Own elaboration

As illustrated in Table 4 of the Proactive Dimension, in the Pretest of the experimental group, 70% (21) of the students were classified as Beginners, 27% (8) were in the Process category,

and 3% (1) were in the Achieved category. In the pretest of the control group, 68% (20) of the participants were classified as "Start," 27% (8) as "Process," and 5% (1) as "Achieved." A subsequent evaluation of the post-test results reveals a substantial discrepancy between the outcomes of the two groups, namely the experimental and control groups. In the experimental group, the "Home" category is deserted, while in the control group, 19 students (65%) are present. In the "Process" category, the experimental group places 21 (70%), while in the control group, 9 (30%) are present. In the "Achieved" category, 9 participants (30%) are present in the experimental group, and only 1 (5%) is present in the control group.

4.2. Inferential results

Testing the Hypothesis by Mean Difference

H1 The application of the Jigsaw Didactic Strategy influences the level of cooperative learning in English language students at a university in the city of Barranca, 2022.

$$H1 = \mu e \geq \mu c$$

H0 The application of the Jigsaw Didactic Strategy does not influence the level of cooperative learning in English language students at a university in the city of Barranca, 2022.

$$H0 = \mu e \leq \mu c$$

Where:

μe: Average post-test scores of the cooperative learning level of the experimental group in English language learners from a university in the city of Barranca, 2022.

μc: Average posttest scores of the cooperative learning level of the control group in English language learners from a university in the city of Barranca, 2022.

4.2.1. Testing the hypothesis by Mann Whitney's U

Decision Rule:

If the p-value is less than or equal to α, then the null hypothesis is rejected.

$$H0 = p - valor \leq \alpha$$

If the p-value is greater than α, then the null hypothesis is accepted.

$$H1 = p - valor \geq \alpha$$

4.2.2. General hypothesis testing

Table 5: Average ranges of cooperative learning of English language learners at a university in the city of Barranca, 2022 (control and experimental group) according to pre-test and post-test.

Testing	Group	N	Average Rank	Sum of ranks
Pre-test	Experimental	30	22,80	488,50
	Control	30	23,80	501,50
Postest	Experimental	30	28,40	619,50
	Control	30	18,40	370,50

Source: Own elaboration

In Table 5, the mean or average range of the pretest in both groups is similar, 22.80 for the experimental and 23.80 for the control, for the post-test there is a greater difference of 28.40 for the experimental group (after the application of the Jigsaw didactic strategy) and 18.40 for the control group. Therefore, and in accordance with the formula, the null hypothesis is rejected.

Table 6: Mann Whitney's U test for the dependent variable: Cooperative learning in English language learners from a university in the city of Barranca, 2022.

Testing	*U for Mann Whitney*	*Z*	*p*
Pre-test	*245,500*	*-,183*	*,878*
Postest	*123,500*	*-3,316*	*,001*

Source: Own elaboration

Table 6 shows that the students improved their cooperative learning after the application of the strategy, when applying the Mann Whitney U test, a bilateral significance of .001 appears, a value less than .05, so the null hypothesis is not accepted. On the other hand, the Z score of -3.316 is higher than the reference of 1.6706 and falls into the rejection zone, confirming again the influence of the Jigsaw strategy on cooperative learning in those evaluated.

4.3. Specific Hypothesis Test 1

Table 7: Average ranges of the social dimension of English language learners at a university in the city of Barranca, 2022 (control and experimental group) according to pre-test and post-test.

Testing	Group	N	Average Rank	Sum of ranks
Pre-test	Experimental	30	21,83	489,00
	Control	30	23,31	511,50
Postest	Experimental	30	29,10	620,30

	Control	30	18,90	396,00

Source: Own elaboration

In Table 7, the average range for the pretest is similar in the groups, 21.83 for the experimental and 23.31 for the control, for the post-test the difference is greater: 29.10 for the experimental group (after the application of the Jigsaw didactic strategy) and 18.90 for the control. Therefore, and in accordance with the formula, the null hypothesis is rejected.

Table 8: Mann Whitney U test for the social dimension in English language learners at a university in the city of Barranca, 2022.

Testing	U for Mann Whitney	Z	p
Pre-test	222,500	-,483	,625
Postest	126,500	-3,086	,002

Source: Own elaboration

Table 8 shows that the evaluated show improvements in their cooperative learning after the application of the strategy. The application of the Mann Whitney U test allows us to see a bilateral significance of .002, a value less than .05, so the null hypothesis is not accepted.

On the other hand, the Z score of -3.086 is higher than the reference 1.6706 and is in the rejection zone, therefore, the influence of the Jigsaw strategy on cooperative learning in English language students is once again confirmed.

4.4. Specific hypothesis test 2

Table 9: Mann Whitney U test for the social dimension in English language learners at a university in the city of Barranca, 2022.

Testing	Group	N	Average Rank	Sum of ranks
Pre-test	Experimental	30	20,48	468,00
	Control	30	22,01	501,50
Postest	Experimental	30	29,60	640,50
	Control	30	18,25	382,00

Source: Own elaboration

In Table 9, the average range of the pretest is similar in both groups, 20.48 in the experimental group and 22.01 in the control group, for the post-test the contrast is greater, 29.60 for the experimental group (after the application of the Jigsaw didactic strategy) and 18.25 for the control. Therefore, and as for the formula, the null hypothesis is rejected.

Table 10: Mann Whitney U test for the innovative dimension in English language learners from a university in the city of Barranca, 2022.

Testing	U for Mann Whitney	Z	p
Pre-test	208,500	-,922	,328
Postest	84,500	-4,452	,000

Source: Own elaboration

Table 10 shows the improvement in cooperative learning after the application of the strategy, the Mann Whitney U test shows a bilateral significance of .000, a value less than .05, so the null hypothesis is not accepted.

On the other hand, the Z score of -4.452 is higher than the reference of 1.6706 and is in the rejection zone, once again confirming the influence of the Jigsaw strategy on cooperative learning in the participants.

4.5. Specific Hypothesis Test 3

Table 11: Average ranks of the proactive dimension of English language learners at a university in the city of Barranca, 2022 (control and experimental group) according to pretest and posttest.

Testing	Group	N	Average Rank	Sum of ranks
Pre-test	Experimental	30	20,80	454,00
	Control	30	23,33	516,00
Postest	Experimental	30	29,34	617,60
	Control	30	19,70	402,00

Source: Own elaboration

In Table 11, the average range is similar in the pre-test of the two groups, 20.80 for the experimental and 23.33 for the control, for the post-test the contrast is greater, 29.34 for the experimental group (after the application of the Jigsaw didactic strategy) and 19.70 for the control. Therefore, and in accordance with the formula, the null hypothesis is rejected.

Table 12: Mann Whitney U test for the proactive dimension in English language learners at a university in the city of Barranca, 2022.

Testing	U for Mann Whitney	Z	p
Pre-test	210,000	-,966	,398
Postest	88,500	-4,400	,000

Source: Own elaboration

Table 12 shows an improvement in cooperative learning after the application of the strategy. the Mann Whitney U shows a bilateral significance of .000, a value less than .05, so the nullMannsis is not accepted.

On the other hand, the Z score of -4.400 is higher than the benchmark of 1.6706 and falls into the rejection zone, which confirms again the influence of the Jigsaw strategy on cooperative learning in students.

5. DISCUSSION

In relation to the primary objective of the research, the findings indicate that the implementation of the Jigsaw didactic strategy resulted in a substantial enhancement in the collaborative learning of English learners. A subsequent statistical analysis revealed significant disparities between the two groups, with a p-value of .001, Z = −3.316, U = 123,500, indicating a high degree of statistical significance. This finding permitted the rejection of the null hypothesis and the acceptance of the alternative hypothesis. These results support the hypothesis that the Jigsaw strategy has a positive impact on the promotion of collaborative learning in the university environment.

From a descriptive perspective, the findings indicate that, prior to the intervention, the two groups exhibited comparable levels of collaborative learning, with a predominant focus on the initial level in both the experimental and control groups. However, following the implementation of the Jigsaw strategy, the experimental group demonstrated a substantial advancement, while the control group maintained predominantly at baseline levels. This significant change indicates that the observed improvement is a direct consequence of the implemented strategy rather than an external factor.

These findings are consistent with the results documented by Caraballo et al. (2020), who stated that the use of the Jigsaw method enhances collaborative learning by promoting critical thinking, peer interaction, and the co-creation of knowledge. In a similar vein, Cruz et al. (2016) have indicated that this strategy activates the student's educational process, reinforces their communicative skills, and promotes collaboration. These aspects are clearly reflected in the results achieved in this research.

Collaborative learning can be analyzed from the perspective of sociocultural theory, which posits that learning is a process based on social interaction and joint development. In this context, Monereo (2017) posits that collaborative learning functions as a catalyst for enhancing social interaction and cognitive growth, enabling students to approach problems with confidence while cultivating social and cognitive abilities. These insights elucidate the observed changes in the experimental group, wherein continuous interaction and shared responsibility fostered more meaningful learning.

Moreover, the outcomes are consistent with the tenets of constructivism, a theoretical framework that posits the student as an active agent in the construction of knowledge. Krahenbuhl (2016) posits that collaborative learning is an unconventional approach that considers the abilities, skills, values, language, and emotions of students, aspects that were encouraged through the use of Jigsaw. In a similar vein, Djamane (2016) conceptualizes learning as a perpetual process of social construction of knowledge and collaborative reflection, which is evidenced by the enhancement of collaborative learning observed post-intervention.

According to West (2018), collaborative learning is defined as an active approach that facilitates the performance of group activities aimed at mutual cooperation. In the domain of English language acquisition, this pedagogical approach holds particular significance, as it emphasizes the exchange of ideas, the cultivation of peer relationships, and the fostering of a positive classroom atmosphere. Under this methodology, students are encouraged to take ownership of their own learning as well as the learning of their peers.

With respect to the initial specific objective, the findings indicated that the implementation of the Jigsaw strategy in its social dimension resulted in substantial enhancements in collaborative learning (p = .002; Z = −3.086; U = 126,500). Prior to the intervention, the majority of the students in the experimental group were at the initial level. However, following the implementation of the strategy, a substantial increase in the process level was observed. In contrast, the control group predominantly remained at the initial level. These findings indicate that the social dimension of Jigsaw has a favorable impact on collaborative learning.

These results align with the findings reported by Patiño (2017), who observed that the implementation of the Jigsaw method enhances interpersonal skills and the capacity to resolve conflicts, thereby fostering constructive interaction among students. In a similar vein, Cruz et al. (2016) have noted that the Jigsaw

strategy, by emphasizing socio-interactive elements, has been shown to facilitate learning and enhance communicative skills, thereby contributing to the development of collaborative work in the context of English language instruction.

The social aspect of Jigsaw fosters the expression of opinions, the negotiation of meanings, and the resolution of conflicts in a collaborative way, promoting the joint construction of knowledge (Martínez & Benítez, 2016). In this regard, León et al. (2015) have noted that collaborative work strengthens communication skills, solidarity, and group commitment, which are evident in the enhancement of collaborative learning observed in the experimental group.

Regarding the second specific objective, the findings indicated that the implementation of the Jigsaw strategy in its innovative dimension yielded substantial enhancements in collaborative learning ($p = .000$; $Z = -4.452$; $U = 84{,}500$). Following the intervention, the experimental group demonstrated a significant advancement in their progression towards the process and achievement levels. In contrast, the control group predominantly remained at the initial and process levels. These results underscore the pivotal role of Jigsaw's innovative dimension in fostering collaborative learning.

These findings align with the observations made by Brito et al. (2021), who concluded that the implementation of innovative strategies fosters communicative interaction and collaborative learning in English teaching. Furthermore, Mamani (2016) and Anticona (2016) have indicated that the implementation of innovative cooperative strategies has a positive impact on students' fluency in the language, their written production, and their academic performance.

Martínez and Benítez (2016) posit that the innovative nature of Jigsaw fosters adaptability, creativity, and critical analysis, thereby empowering students to assume active and reflective roles in their own learning. In a similar vein, Suárez (2004) underscores the significance of both personal and collective motivation in fostering collaborative ties and attaining shared objectives. These elements are corroborated by the findings of this research.

6. CONCLUSIONS

The findings of the study indicate that the implementation of the Jigsaw teaching strategy exerts a positive and significant influence on the collaborative learning of English learners at a university in Barranca. The findings, derived from meticulous statistical analyses, reveal a conspicuous improvement in the performance of students who participated in the intervention, in comparison to those who adhered to conventional methodologies. This observation lends substantiation to the efficacy of cooperative learning strategies within the context of higher education.

In general, the implementation of Jigsaw facilitated the progress of students from fundamental levels to stages of experience and achievement in collaborative learning. This finding demonstrates that this technique influences not only the acquisition of knowledge, but also the ways in which students interact, collaborate, and assume roles within the group. This finding underscores the notion that cooperative learning plays a pivotal role in the comprehensive development of university students, particularly in the context of foreign language acquisition.

In terms of the social dimension, it is concluded that the Jigsaw strategy had a notable impact on the improvement of students' interpersonal skills, promoting adequate communication, respectful dialogue, and joint conflict resolution. The enhancement evident in this domain suggests that structured interaction and collective responsibility in the learning process engender a conducive classroom environment, fostering students' engagement and collaborative construction of knowledge.

In relation to the innovative dimension, the results demonstrate that the implementation of Jigsaw enhanced intellectual flexibility, creativity, and critical thinking among students, thereby empowering them to assume an active role in their learning. This strategy promoted the search for creative solutions and the exchange of ideas, resulting in more dynamic and relevant collaborative learning. This finding underscores the necessity of incorporating innovative methodologies that adapt to current demands in university education.

Furthermore, regarding the proactive dimension, it is concluded that Jigsaw strengthened the students' ability to assume both individual and group responsibilities, adjust to new work dynamics, and actively participate in evaluation and collective feedback processes. The strategy's proactive nature enabled students to identify their strengths and weaknesses, fostering an attitude focused on continuous improvement and collaborative learning.

The results of the study generally corroborate the hypothesis that the Jigsaw teaching strategy is an effective pedagogical tool for enhancing cooperative learning in the context of English instruction at the university level. The implementation of these pedagogical practices has been demonstrated to yield

a multifaceted impact on students' academic performance, fostering the development of a range of competencies that are deemed fundamental for the comprehensive training of students and their future integration into the professional workforce. These competencies include, but are not limited to, social, communicative, and innovative skills.

A comprehensive review of the available literature reveals that the regular incorporation of cooperative methods, such as Jigsaw, into the organization of English language instruction can have a significant impact on the advancement of English learning. These methods have been shown to foster more active and relevant educational experiences that align with current pedagogical trends.

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