

Game-based learning strategy to develop English skills among bachelor students

Game-based learning strategy to develop English skills

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ABSTRACT

Improving English proficiency, especially in regions where it is not the mother tongue, can pose a number of challenges. As a result, a number of researchers have taken steps to investigate and create new strategies to address this problem. Aiming to strengthen English language learning and skills such as listening, reading, speaking, and writing, this study constructed a Game-based Learning strategy to improve English skills in bachelor students. For that reason, this study is quasi-experimental, with a quantitative approach and descriptive scope, since the participants were first, selected through the convenience and opportunity sampling method, then classified into control and experimental groups, and finally, evaluated through the Cambridge Test PET (Preliminary English Test B1) which functioned as a pre-test and post-test. Later, the results obtained in the pre-

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test and post-test were contrasted to test the hypotheses and finally draw conclusions about the effectiveness of the strategy. Among the main results, it was found that the experimental group improved their level of English by 18%, which was an enriching experience in the application of Gamification in English skills.

KEYWORDS: gamification; strategy; English; skills; bachelor students.

Estrategia de aprendizaje basado en juegos para desarrollar las competencias de inglés en los estudiantes de bachillerato

RESUMEN

Mejorar los conocimientos de inglés, especialmente en regiones donde no es la lengua materna, puede plantear diversos retos. Como consecuencia, diversos investigadores han tomado medidas para investigar y crear nuevas estrategias para hacer frente a este problema. Con el objetivo de fortalecer el aprendizaje del inglés y sus habilidades como escuchar, leer, hablar y escribir. Este estudio construyó una estrategia basada en el juego para mejorar las habilidades de inglés en estudiantes de bachillerato.

Por esa razón, este estudio es cuasi-experimental, con un enfoque cuantitativo y alcance descriptivo, ya que los participantes fueron primero, seleccionados a través del método de muestreo de conveniencia y oportunidad, luego clasificados en dos grupos control y experimental, y finalmente, evaluados a través del Cambridge Test PET (Preliminary English Test B1) la cual funcionó como pre-test y post-test. Luego los resultados obtenidos en el pre-test y en el pos-test fueron contrastados para posteriormente comprobar las hipótesis y finalmente extraer las conclusiones sobre la eficacia de la estrategia. Entre los principales resultados se encontró que el grupo experimental mejoró su nivel de inglés en un 18%, lo que supuso una experiencia enriquecedora sobre la aplicación de la gamificación en las habilidades del inglés.

PALABRAS CLAVE: gamificación; estrategia; habilidades; inglés; estudiantes de bachillerato.

INTRODUCTION

Nowadays, English teaching in Ecuador has become a fundamental element for basic and bachelor students. Through language teaching process is intended to empower students with assertive competencies to face globalization in order to open new horizons for their professional development. On the other hand, global statistics from the UNESCO (United Nations Educational, Scientific and Cultural Organization) in the year 2016 points English language as the second most practiced language. However, according to the observations made in the academic field, it has been detected that the lack of strategies and methods for teaching caused a decrease by 60 percent, of motivation for learning a foreign language, especially because of the level of difficulty of some English skills (Palma, 2020).

In September 2021, English language proficiency levels in Ecuador varied widely across different regions and age groups. The English proficiency of Ecuadorians was generally lower compared to some other Latin American countries, being Ecuador the second country with lowest level of English (Jeon, 2023).

Common European Framework of Reference (CEFR) Levels:

English language proficiency is often categorized using the Common European Framework of Reference for Languages (CEFR) levels, which range from A1 (beginner) to C2 (proficient). Here's a general overview of the English language proficiency levels in Ecuador as of that time:

a) Low Proficiency (A1 to A2): Many Ecuadorians have basic English skills, capable of simple conversations and understanding commonly used phrases. These individuals might struggle with more complex language usage and detailed communication.

b) Limited to Moderate Proficiency (B1 to B2): Some Ecuadorians could engage in more detailed conversations and understand a wider range of vocabulary. They might be able to express themselves on familiar topics, but fluency and accuracy could vary.

c) Higher Proficiency (C1 to C2): Fewer individuals in Ecuador reached these higher proficiency levels. Those at C1 could handle complex language tasks and communicate effectively in various situations. Those at C2 had near-native or highly advanced proficiency.

The situation in which students are immersed has a direct influence on the English learning processes, since students do not see the need to master a second language so, numerous studies have dealt with this problem.

However, efforts were being made to improve English language education and proficiency nationwide through the application of different strategies to strengthen English levels which are pertinent to the environment and belong to a heterogeneous environment where information and technologies in education constitute a phenomenon of great social transcendence (Bundick et al., 2014). Therefore, the teaching-learning processes of English has been changing and new theories propose the teaching of this from contextualized environments and practices that allow students to have a meaningful learning.

Improving English skills, especially in regions where it's not the primary language, can present a range of challenges. These challenges can vary depending on factors like cultural context, educational systems, and access to resources. Eventually, overcoming these challenges requires a combination of effective teaching methods, access to resources, immersive experiences, and a positive learning environment. That is why it is important to approach language learning with patience, perseverance, and willingness to engage actively with the language in various contexts (Zhai, 2023).

As consequence, researchers have taken measures to investigate and create new strategies to face this problem from which language learning can be strengthened and skills like: listening, writing, speaking, and reading can be acquired more easily (Del Vasto, 2015). Due to learning English, like any other language, requires a combination of strategies to effectively acquire and develop language skills.

Here are some commonly used strategies to learn English explained by Bundick (2014): 1) Immersion: Surround with the English language as much as possible, by watching English movies and TV shows, by listening to English music and podcasts, and by reading English books, newspapers, or magazines; 2) Practice Speaking: regularly with native speakers or language partners, by engaging in conversations, participating in language exchange programs, or joining language clubs to practice speaking skills and gaining confidence; 3) Vocabulary Building: by learning new words and phrases every day, by using flashcards, vocabulary apps, or language learning websites to expand English vocabulary, by practicing the new words in sentences to reinforce their usage; 4) Language Learning Apps: Utilizing language learning apps like Duolingo, Memrise, or Rosetta Stone to practice reading, listening, speaking, and writing skills in a structured and interactive manner; 5) Scaffolding: by providing appropriate support and assistance to learners to enhance their overall learning experience and promoting higher levels of achievement; 6) Game-

based learning: brings the strategies, rules and social experiences of playing several games while learning.

In accordance with the alternatives reviewed to meet this need in which Córdoba et al. (2017) agree that the use of games in education makes the classroom a playful place of learning and constant motivation for many students. Games also inspire students to think, to create, and to recreate with activities that contribute to the development of attention and active reading skills. The Game-based Learning model allows teachers to target certain activities that will benefit the real-world application of concepts due this can lead to more immersive and collaborative learning opportunities (Mariya, 2016).

The research project seeks to generate a pedagogical strategy by using games to strengthen students' English skills. In this way, teachers can enhance student's English levels by allowing them to exceed their own expectations additionally, it allows teachers to explore in depth how to use different strategies linked with the development of English skills.

Based on this context, the research question is the following. Does the Game-based Learning strategy improve student's English Skills? According to this research question the hypothesis are the following.

H0. The application of the Game-based Learning strategy will develop English skills in bachelor students.

H1. The application of the Game-based Learning strategy will not develop English skills in bachelor students.

Consequently, the main objective of this research is to determine the effectiveness of Game-based Learning for the enhancement of students' English skills. The specific objectives are 1) to describe bibliographical citations about Game-based Learning which is suitable for English skills improvement; 2) to analyze English skills deficiencies among third-year of bachelor students through a pre-test; 3) to apply the Game-based Learning strategy and measure the impact on the English skills through a post-test.

Game-based Learning Strategy

Game-based Learning is a teaching method that uses the power of games to define and support learning outcomes. A GBL environment achieves this through educational games that have elements such as engagement, immediate rewards, and healthy competition. All so that while

students play, they stay motivated to learn (Mariya, 2016). Those can be applied through online games or in person. On one hand, online games also offer a delicate balance between in-class lessons and educational gameplay due teachers introduce students to new concepts and show them how to work. Then, students are able to practice these concepts through digital games. While, in person students can use physical objects where teachers would use a traditional learning environment to help students to understand rules while, they have fun. Those games could be played independently or in teams (Griva et al., 2020).

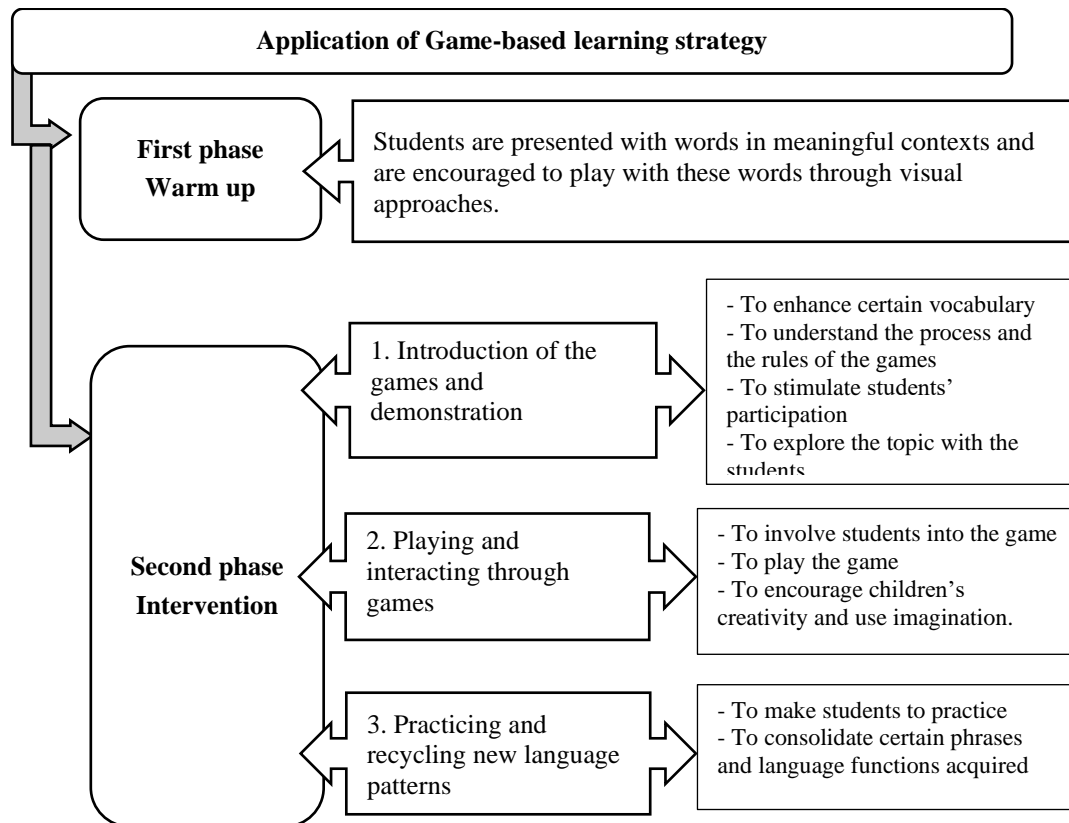
Some of the benefits of using Game-based Learning are: stimulating students' motivation for English learning; enhancing involvement in learning through senses, and integrating new or relevant topics to previous knowledge. Game-based Learning should have a guide instruction to create a positive environment, and generate academic success. According to Ghazy et al. (2021) the strategy has some stages, which have to be applied in order to get success in students' English skills, these stages are explained in Figure 1.

The project has two major stages the first is the warm-up phase, where a visual approach must be followed to familiarize students with certain words and simple common phrases in English. Then, the second stage is the intervention which has three sub-stages of intervention, starting with the introduction of the games where, the teacher gives a brief description of each game. The purpose of this stage is to make students enhance certain vocabulary, and develop concepts and functions, as well as understanding the process and the rules of each game. Besides, it is important to stimulate students' participation in the games (Rincón, 2022).

Then, the teacher is able to explore the topic with the students. Consequently, the second stage is playing and interacting through games, the main purpose of this step is to involve students into the game, for this step, a recommendation on this stage is to create an enjoyable learning atmosphere, as well as encouraging students' creativity by using their imagination. Finally, the last sub-stage is practicing and recycling new language patterns. During this stage, teachers make students to practice and recycle certain phrases and language functions which were acquired in the previous steps (Cheung, 2021).

Figure 1

Model of application of the strategy Game-based learning



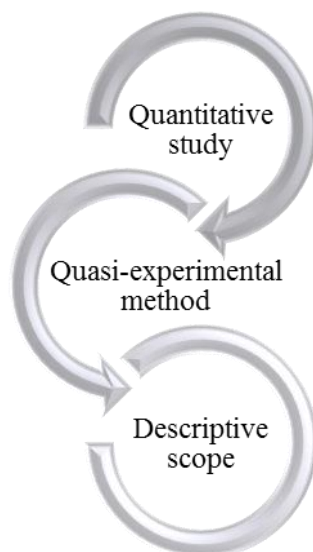
Note. Adapted from the study of Ghazy et al. (2021). The model explains how game based strategy should be applied.

METHODOLOGY

This study is quasi-experimental, with a quantitative approach and descriptive scope since it is oriented towards a quantitative paradigm, which is understood as the validation of knowledge where only valid knowledge is accepted as verifiable, measurable and visible (Thomas, 2022). A quasi-experimental research was used due this design establishes a cause-and-effect relationship between the variables dependent and independent

Figure 2

Research Design



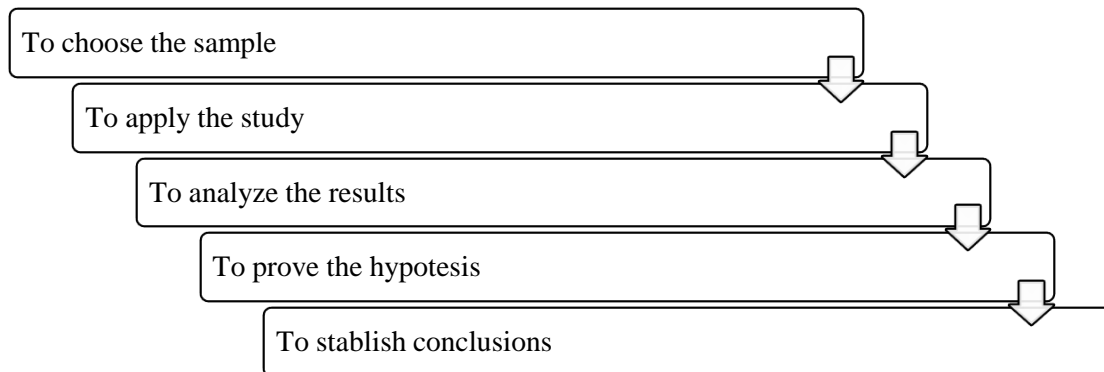
Note. Adapted from “Validez Estructurada para una investigación cuasi-experimental de calidad”, by Fernandez et al. (2014), *Anal. Psicol*, 30(2).

The reason why the quantitative research was chosen is because the data required for hypothesis testing are numerical data to explain the relationship between the variables (Game-based Learning and English skills), due this processes allows to obtain accurate data on the object of study. The study has a descriptive scope because it aims to provide a detailed and comprehensive account of a particular phenomenon, situation, event, or subject (Thompson, 2021).

Then, two techniques were applied in this study, bibliographic research and field research. The bibliographic research technique was used to contrast the theoretical framework of departure, for this, the study was carried out by reviewing scientific texts to obtain relevant information about the subject. The literature on the theoretical foundations of the variables Game-based Learning and English skills were reviewed, as well as the measurement instruments used by the studies on the topics related to the aforementioned variables. For the field research technique, two questionnaires were used, the first to obtain information on the students' English level and the second to obtain information on the students' level of satisfaction about the strategy.

Figure 3

Research process



Note. Adapted from “Validez Estructurada para una investigación cuasi-experimental de calidad”, by Fernandez et al. (2014), *Anal. Psicol*, 30(2).

As part of the study process, firstly, the groups to be part of the study were selected through Convenience and opportunity sampling method, this technique uses people from an already defined population which was chosen because of the convenience of the researcher. Then, the study was applied, it means the application of the strategy Game-based Learning. Thirdly, the results obtained from the pre-test and post-test were contrasted to later test the hypotheses and finally to draw the conclusions about the effectiveness of the strategy.

The population defined were the students of "Unidad Educativa Luis Fernando Ruiz" of Latacunga city since there is a relationship with this Institution. Third-Bachelor students were taken as a sample since they are the target group of this research and they need to improve their English skills in order to apply them into personal and academic context, especially when they start studying the university.

The data were collected in August 2023, with prior authorization from the authorities. The instrument for the study was obtained from Cambridge Test PET (Preliminary English Test B1). It functioned as a pre-test and post-test. Level B1 is mainly used for teenagers and bachelor students between 16 to 18 years, according to the International Institute Cambridge English Qualifications (2020). The scale was developed by following well-documented instruments which link the students' performance according to their level.

The evaluation aims to test the English level by evaluating the four English skills reading, listening, writing and speaking. Once the population size and the object of study were defined, the pre-test

was applied to the two groups of interest to analyze the English level. The test was applied by answering the four sections of the test. Consequently, a technical data sheet in table 1 provides a description about the participants and the study.

Table 1

Research Technical Data Sheet

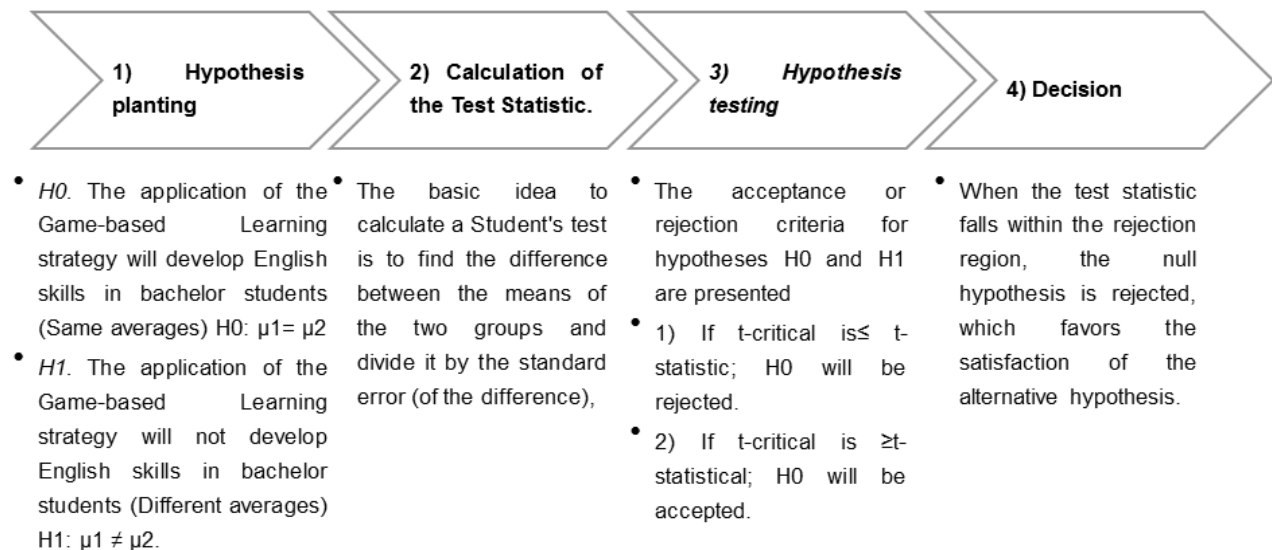
Item	Description
Target	2 groups of 31 students (62 students in total)
Temporality	August 2023
Method	Questionnaire Pre-test and Post-test
Valid Questionnaires	62

Note. This table shows a resume of the data that will be collected according to the target, temporality, method, and number of questionnaires. Adapted from “Técnicas de muestreo y determinación del tamaño de la muestra en investigación cuantitativa”. By Rabolini (2009), *Revista Argentina de Humanidades y Ciencias Sociales*, 2.

After the results were collected, they were transcribed to an Excel sheet to analyze the results of the four sections. Then, the addition of these four sections was the result for each student. To investigate the effectiveness of this strategy, a structured program was designed to allow students to complete 16 planned sections during August and September 2023. Once the lesson plans were approved, they were run with an experimental team. Subsequently, the same test was used to determine if the English skills had changed by applying the post-test to the experimental and control groups, in order to observe if there were significant changes that show the effect of the independent variable (Game-based strategy) on the dependent variable (English skills). Then using the statistical T-Student test was used for hypothesis testing.

Student's t-test

Hypothesis testing or contrast is a statistical reasoning procedure used to answer a research question from the evidence contained in a data set. The process includes a four phase hypothesis approach according to Hurtado y Silvente (2012).

Figure 4*Process for the hypothesis testing*

Note. The figure illustrates the four stages to test the hypothesis. Adapted from “Cómo aplicar las pruebas paramétricas bivariadas t de Student y ANOVA en SPSS. Caso práctico”. *Reire*, 5(2).

Finally as the last part of the methodology, a satisfaction questionnaire obtained from the study of Brioso (2021) was also used, where 15 questions were asked divided into 3 categories, motivation, learning and innovation where each question contains 5 multiple choice answers on a Likert scale of 1 to 5, being 1 the lowest satisfaction value and 5 the highest value.

RESULTS*Pre-test and post-test results***Table 2***Pre-test and post-test comparison*

Item	Experimental group averages	Experimental group averages %	Control group averages	Control group averages %
Pre test	6.75	67.5%	6.71	65.1%
post- test	8.64	86.4%	6.87	68.7%

Note. Mean pre-test and post-test results of the control and experimental groups.

The table allowed to contrast the results obtained in the pre-test versus the post-test, these tests were used to analyze the impact of strategy as a mediation to strength English skills, where the students' answers were registered according to the number of correct answers. Then, an average per course was obtained over ten points and percentages.

Among the application of the pre-test, the experimental group obtained an average of 6.75 out of 10, which in percentage represents 67.5% of mastery of English skills domain. On the other hand, the control group obtained 6.51 out of 10, which in percentage represents a 65.1% of mastery on the English skills. In other words, there is a variation of 2.4% between the two groups, which can be interpreted that there is no significant difference between the two groups during the pre-test. It also can be assimilated that according to the results the English level is similar in both groups.

Through the application of the post-test, the experimental group obtained an average of 8.64 out of 10, which in percentage represents 86.4% of domain of the English skills. On the other side, the control group obtained 6.87 out of 10, which in percentage represents 68.7% of mastery on the already mentioned skills, therefore, there is a variation of 18% among the two groups, this result means that there is a significant difference in the groups experimental and control.

Hypothesis testing

1) Hypothesis statement.

H0: $\mu_2 - \mu_1 = 0$ (Post-test and pre-test means are equal).

H1: $\mu_2 - \mu_1 \neq 0$ (Post-test and pre-test mean are different).

2) Calculation of the Test Statistic.

Since the sample is greater than 30, the t-statistic presents a t-distribution with 55 degrees of freedom. Therefore, with the help of the Microsoft Excel program, the following results described in the table 3 were obtained.

Table 3

Two-sample t-test

<i>Items</i>	<i>Experimental group</i>	<i>Control group</i>
Media	8.64516129	6.870967742
Variance	2.169892473	1.182795699
Observations	31	31

Hypothetical difference of means	0
Degrees of freedom	55
Statistic t	5.394923136
P(T<=t) a tail	7.46672E-07
Critical value of t (one-tailed)	1.673033965
P(T<=t) two tails	1.49334E-06
Critical value of t (two-tailed)	2.004044783

Note. Prepared by the authors based on data obtained from the pre-test and post-test with the help of Microsoft Excel.

3) Hypothesis testing.

The acceptance or rejection criteria for hypothesis H0 and H1 are presented below.

- 1) If $t\text{-critical} \leq t\text{-statistic}$; H0 will be rejected.
- 2) If $t\text{-critical} \geq t\text{-statistic}$; H0 will be accepted.

The results of the data showed that with the risk level of 0.05 and degrees of freedom=55; critical $t = 2.00404444783$; T-statistic= 5.394923136.

If $t\text{-critical} \leq t\text{-statistic}$; H0 will be rejected, in other words as $t\text{ critical}$ is equal to 2.004044783 and $t\text{-statistic}$ is equal to 5.394949231313, H0 is rejected

4) Decision.

Based on the criterion that If $t\text{-critical} \leq t\text{-statistic}$; H0 is rejected and H1 or alternative hypothesis is accepted, since the value of critical T is less than the value of t-statistic and the null hypothesis does not meet the criteria. Therefore, it is worth mentioning that the level of English is different between the two groups.

Satisfaction survey

Motivation dimension.

Table 4

Level of satisfaction of the dimension Motivation

Item	Number of students	Likert scale value	Total in points	Percentage of satisfaction
Never	2	1	2	2%

Almost never	1	2	2	2%
Sometimes	6	3	18	15%
Almost always	10	4	40	33%
Always	12	5	60	49%
Total	31	15	122	100%

Note. The table shows an average level of satisfaction with the motivation dimension. Own elaboration according to the data.

Out of a total of 31 respondents, 49% affirmed that they always feel motivated to use Game-based Learning strategy, opposed to the 2% who never feel motivated to use the platform. Being that the half of students agree with the level of motivation that they had when using Game-based strategy.

Learning dimensión.

Table 5

Level of satisfaction Learning dimension

Ítem	Number of students	Likert scale value	Total in points	Percentage of satisfaction
Never	1	1	1	1%
Almost never	3	2	6	5%
Sometimes	5	3	15	12%
Almost always	8	4	32	26%
Always	14	5	70	57%
Total	31	15	124	100%

Note. The table shows an average of the learning dimension. Own elaboration according to the data.

Out of a total of 31 respondents, 57% state that of the times they used Game-based, their learning level always had a positive impact, however 1% never felt that the use of the already mentioned strategy influenced their learning level.

Innovation dimension.

Table 6*Level of satisfaction of the dimension Innovation*

Ítem	Number of students	Likert scale value	Total in points	Percentage of satisfaction
Never	2	1	2	2%
Almost never	2	2	4	3%
Sometimes	3	3	9	7%
Almost always	10	4	40	34%
Always	14	5	70	56%
Total	31	15	125	100%

Note. The table shows an average level of satisfaction with the innovation dimension. Own elaboration according to the data.

Out of a total of 31 respondents, 56% stated that they always felt that the use of Game-based strategy was innovative, while 2% stated that they never felt innovation when using Game-based Learning. According to the results obtained, it was found that more than half of the students surveyed agree that game based is an innovative tool.

DISCUSION

Based on the analysis carried out using the Microsoft Excel program, the following information is the articulation between the theoretical, empirical and practical components, which are part of the research process already developed. This will make it possible to answer the general objective of the research by analyzing the correspondence between Game-based Learning and English skills.

Taking into account the results obtained by applying pre- and post-tests during the development of the quasi-experimental study and comparing both results, it is possible to observe the influence of Game-based Learning strategy in enhancing English skills in the third level of the students of "Luis Fernando Ruiz High school" where the difference of results means that the students of the experimental group improved their English skills by 18%, this being a positive result of the independent variable (Game-based strategy) with respect to the dependent variable (English skills).

As for the hypothesis testing, according to the results, the null hypothesis was rejected and the alternative hypothesis was accepted, indicating that Game-based strategy had a significant impact on the development of students' English skills.

With respect to the results of the satisfaction survey, it was also possible to identify a better *motivation* to learn, with an evident increase in academic performance, which are the reasons why more than half percent of the students are satisfied with the use of the Game-based strategy. Since 49% of students surveyed affirmed that they always feel motivated to use a Game-based strategy. In light of the above, there are other studies such as Acosta (2021) who mentions that Gamification is used as a means of motivation for students given that when it is used creatively it increases student's motivation. Eventually, Razali (2020) demonstrated that the impact of the use of Game-based Learning in educational fields reflects positive results due to the high motivation when making use of the didactic strategies.

On the other hand, talking about *learning*, 57% state that during the times they used Game-based strategy their learning level always had a positive impact. It can be noted and emphasized that the level of the students improved significantly due to the implementation of the already mentioned strategy where the students' perceptions show an improvement in linguistic skills since it allows students to keep playing while they learn. Game-based strategy has proven to be a powerful tool that complements traditional education and provides students and educators with an enriching learning experience according to Jeon (2023).

Finally talking about *innovation* 56% of the students stated that they always felt that the use of Game-based strategy was innovative. It is very interesting to note that according to the results obtained in this research, it was found that more than half of the students surveyed agree that Game-based Learning is an innovative tool because students learn while they are playing. In addition, Rasulovna (2023) suggests that one of the reasons for the introduction of gaming in education is the renewal of pedagogical practices through the new didactic opportunities they offer, to ensure better student learning and decrease school failure and thus, contribute to educational quality. Therefore, its use and application in learning have had a great impact on the innovation of new teaching-learning methodologies (Miranda, 2021).

Also, in the course of the research, many international articles, dissertations, and master's theses were found, which show very positive results of the strategy. Nevertheless, in Ecuador Game based strategy is not well known in comparison with other strategies such as scaffolding,

immersion, language learning apps, vocabulary building, and conversation practices (Villamar, 2021).

CONCLUSIONS

The development of the present research constitutes an enriching experience at a professional level that allowed the application of the learning into a practical educational environment. It is concluded that the students who made up the experimental group obtained higher scores than the students who made up the control group. In addition, during the intervention, the students showed interest and motivation for the learning process. In addition to this, in accordance with the specific objectives proposed in this research, it is presented below a serie of conclusions that arise from the comparison of the results evidenced in the participating groups.

With respect to the first specific objective, the theoretical foundations to consolidate the study were described, and a review of the literature on studies related to the subject of the study and its dimensions was carried out. For this purpose, the current context of the educational system and its intervening factors were described as well as a model presented before in Figure 1 where each stage was described and its activities.

Regarding the second specific objective to analyze English skills deficiencies among third-year bachelor student it was found that both groups of students had a similar level of English Skills showing a deficiency especially in speaking and listening skills.

Finally, the implementation of the strategy in the experimental group led to the fulfillment of the third specific objective, which was intended to analyze the impact of Game-based Learning strategy and measure its impact on the English skills it was found that the students where the strategy was applied showed a higher proficiency of English skills obtaining favorable results, which are observable in the analysis of results and susceptible to subsequent revisions that will allow to deepen this or other researches.

Finally, as future lines of research it is proposed to contrast the effectiveness of different strategies such us scaffolding, immersion, language learning apps, vocabulary building, and conversation practice to identify the pros and cons of each.

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