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Maria Soledad Calderon Calderon [1]*, Carla Massiel Ramiro Jara [2]

[1] Faculty of Health Sciences, Arturo Prat University, Victoria Campus, Chile, mariasca@unap.cl
https://orcid.org/0025-1234-5678-90122
[2] Faculty of Health Sciences, Arturo Prat University, Victoria Campus, Chile , cramiro@unap.cl
https://orcid.org/0000-0002-3407-5401?lang=es

* Correspondence: mariasca@unap.cl or pinelacm23@gmail.com

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Summary:

Gamification has become a current practice in higher education, addressing the challenge of teaching innovation and fostering motivation, participation, and meaningful learning. At Arturo Prat University, the Nursing program has incorporated this strategy using the television game "Pasapalabra" as a formative assessment tool. The objective of this study was to measure the satisfaction level of fourth-year students who experienced gamification through the "Pasapalabra" game in the children's area. A mixed-method study was used, with a quantitative phase of descriptive design and a qualitative phenomenological phase, through content analysis. A Likert scale was administered online to seventh-semester students, validated by experts, and a pilot test with a Cronbach's alpha of 0.986. The last question was open-ended and qualitative. The results showed an overall satisfaction level of 4.57 out of 5.0, considered very high. The conclusion is that these dynamics can be included in higher education, providing high motivation and activating learning in a playful manner. Furthermore, they foster generic skills such as teamwork and communication. Several authors emphasize that active-participatory teaching, including games, is essential for achieving meaningful and lifelong learning, increasing student engagement and improving their academic performance. These findings underscore the importance of gamification as an effective tool for educational innovation in higher education.

Keywords: Gamification, Teaching Innovation, Higher Education, Nursing

Abstract:

Gamification has become a current practice in higher education, addressing the challenge of teaching innovation and fostering motivation, participation and meaningful learning. At Arturo Prat University, the Nursing career has incorporated this strategy using the television game “Pasapalabra” as a formative evaluation tool. The objective of the study is to measure the level of satisfaction of fourth year students who experienced gamification through the game “Pasapalabra” in the children's area. A mixed study was used with a quantitative phase of descriptive design and a qualitative phenomenological phase, through content analysis. A Likert scale was applied, via online, to seventh semester students, validated by experts and a pilot test, with a Cronbach's alpha of 0.986. The last question was open-ended and qualitative in nature. The results showed an overall satisfaction level of 4.57 out of 5.0, considered very high. It is concluded that these dynamics can be included in higher education, providing high motivation and activating learning in a playful way. In addition, they promote generic competencies such as teamwork and communication. Several authors emphasize that active-participative teaching, including play, is essential to achieving meaningful and lifelong learning, increasing student engagement and improving their academic performance. These

findings outline the importance of gamification as an effective tool for educational innovation in higher education.

Keywords: Gamification, Teaching Innovation, Higher Education, Nursing.

1. Introduction

Teaching innovation involves adopting new pedagogical and technological strategies to improve the teaching-learning process, adapting to the constant changes in society (1). Not alien to this, the Arturo Prat University of Chile (UNAP), in its Institutional Educational Model (MEI) (2), declares teaching innovation as an improvement process that must be carried out by academics through the creative integration of new elements that positively impact student learning. This approach seeks to improve training programs and strengthen teaching practice through the implementation of novel and creative teaching-learning techniques and strategies. Following these guidelines, gamification with the television game "Pasapalabra" was used in the children's area of the Nursing program at the Victoria Campus.

The term "gamification" comes from the English word "game" (3). It emerged in the first half of the 21st century in the business and technology sectors, especially in the field of customer loyalty. In 2002, British consultant Nick Pelling defined gamification as "the use of game mechanics in non-game contexts to engage people and solve problems" (4). Since then, it has gained popularity and has become an increasingly used technique in various fields of knowledge, including education and health sciences (5-7). Gamification involves the use of game elements and dynamics in non-game contexts to motivate and increase individual participation (3, 6, 8-9). This technique brings game mechanics to the educational field in order to improve learning outcomes (3-5). It uses game elements as challenges and rewards to make pedagogical activities more attractive, creating a fun environment that encourages participation and engagement with the study material, which in other circumstances might not be of interest to students (8, 10). According to Villamar and Sánchez (8), it represents a didactic innovation that significantly changes teaching in higher education, responding to the challenge of teaching innovation and causing a paradigm shift with the purpose of motivating, improving participation and encouraging meaningful learning (9, 11, 12).

Several authors claim that these methodological strategies can make academic content more interesting, engaging, and meaningful for students (11-14), facilitating active learning and knowledge retention, especially in complex areas such as pediatrics (10). Gamification transforms its entire environment, from the classroom, where it helps develop a more motivating environment, to the role of teachers, who are in charge of designing the game adventure and guiding students throughout the learning process. It also affects the role of the student, who is the protagonist during the game, and the use of resources to build real learning scenarios (8). Although the use of gamification as a formative assessment tool is not yet widespread, this strategy can provide benefits to the learning process: it reinforces more difficult content for students, facilitates rapid feedback, and has a positive effect on motivation, reducing the stress and anxiety generated by traditional assessment processes (8).

The game "Pasapalabra" was created in Spain in 2000 by Rebecca Thornhill, Mark Maxwell-Smith, and Andrew O'Connor. It is a television program based on the British format "The Alphabet Game," which tests the knowledge and mental agility of contestants through a series of language tests. The most emblematic test is the "Rosco," where contestants must complete a circle of 25 definitions, each corresponding to a letter of the alphabet, in a limited time. If they cannot remember a particular definition, the contestant can move on to the next question by saying "pasapalabra." To save time for the Rosco, there are contests that include word games, anagrams, definitions, and musical tracks (15). The "Pasapalabra" game has been incorporated into some university experiences, such as at the Catholic University of the Most Holy Conception in Chile, where three games were used in the Pharmacology course for the Nursing program. The authors conclude that specifically the

"Pasapalabra" had the greatest impact on student learning, allowing the reinforcement of content, stimulating teamwork and achieving a real two-way class (16).

The objective of this study is to measure the satisfaction level of fourth-year nursing students who experienced gamification through the "Pasapalabra" game in pediatrics teaching.

2. Methods

A mixed-method study was conducted with fourth-year nursing students at Arturo Prat University (UNAP), Victoria campus, Chile, in 2023. In the curricular activity "Nursing Care of Children and Adolescents in the Illness Process," the television game "Pasapalabra" was gamified as a formative assessment method in the Neonatology Unit. To this end, the class was divided into two groups that competed in fun tests (the Musical Backing Track, the Musical Rematch, How Do I Spell It?, and Letter by Letter) to accumulate points translated into minutes and then play the "Rosco" game with 25 definitions (one for each group). The winning group received extra points for the individual summative assessment. The research measured student satisfaction with this strategy, which aimed to review perinatal terminology. The study was divided into two phases: quantitative and qualitative, after receiving informed consent.

The *quantitative phase* had a descriptive cross-sectional design with a sample of 30 students from a sample size of 32. Inclusion criteria were: current enrollment in the curricular activity "Nursing Care of Children and Adolescents in the Illness Process" and participation in the "Pasapalabra" training workshop; exclusion criteria were: not currently enrolled in the curricular activity or not having participated in the "Pasapalabra" workshop. A Likert scale was used to measure student satisfaction. The instrument was constructed based on a literature review and the research objectives; it was validated by the judges' criteria and a pilot test administered to fifth-year students who had experienced this same strategy while taking the curricular activity. The five response options ranged from "Very Dissatisfied" to "Very Satisfied." For a better analysis of the results, the instrument was divided into three dimensions, which encompassed the nine questions:

- *Dimension 1. General Aspects***.** This included questions related to the participants, such as whether their personal expectations were met, whether their prior knowledge was adequate for participating in this game, and whether they would be willing to participate again with the same or similar strategy.
- *Dimension 2. Teaching Innovation*. Questions were included about the advantages of using gamification, specifically the Pasapalabras game, as a teaching innovation methodology. These questions explored whether this methodology was a useful teaching-learning tool, whether the game met the learning objectives of the academic unit, and whether the final students' knowledge was enhanced by this activity.
- *Dimension 3. Resources*. This dimension assessed the resources available for carrying out the activity, such as the physical space, the time allocated to each game, and the instructions for each game.

The instrument's reliability was assessed through internal consistency measures using Cronbach's alpha, which was 0.986. Content validity was determined through expert opinion: four expert professionals in the fields of nursing, methodology, psychology, and biostatistics, selected according to the following criteria: teaching experience, publications in indexed journals, and participation in research projects related to education and gamification. Suggestions were collected, and the corresponding modifications were made. To determine the level of satisfaction, the following score was established: 1.0 to 1.7: very low satisfaction; 1.8 to 2.5: low satisfaction; 2.6 to 3.3: medium satisfaction; 3.4 to 4.1: high satisfaction; and $\geq$ 4.2: very high satisfaction.

For the quantitative analysis, SPSS version 25® was used, with descriptive statistics using measures of central tendency: median and mode. Frequencies and percentages were also calculated, with the data being treated with a 95% reliability index.

The *qualitative phase* had a phenomenological design and consisted of a content analysis of the last question of the instrument, which was open and voluntary, to investigate students' suggestions and/or comments regarding the activity carried out. In this section, fifteen students responded, corresponding to 50% of the sample. A content analysis was carried out that consisted of reading each response to identify the thematic elements and coding them. After preliminary coding, the codes that shared characteristics on a specific topic were grouped together and, from these, six categories were developed at the first level, two metacategories at the second level, and a domain at the third level, following the scheme proposed by Miles and Huberman . Regarding the ethical implications of the study, the requirements of Ezequiel Emanuel (17) were met: informed consent (online), scientific validity, equitable selection of subjects (the universe was used), independent evaluation, respect for the participating subjects and social value for the university community, for its contribution to the career by validating an innovative methodological strategy.

3. Results

Regarding the gender and age of the respondents, 78.0% were women, and the majority were between 20 and 25 years old. Regarding the overall level of satisfaction (Figure 1), 87% of respondents rated the activity as "very satisfied," equivalent to a score of 4.57 out of 5.0.

Dimension 1: General aspects.

- 86.7% of respondents expressed a high level of satisfaction with the activity, while only 6.7% expressed being very dissatisfied.
- 70% of students were very satisfied with their prior knowledge to be able to participate in the game, and 16.7% were satisfied, while 13.3% stated they were not satisfied.
- 97% of those surveyed expressed interest in participating in a similar activity again.
- The average satisfaction in these questions was between 4.53 and 4.57.

Dimension 2. Teaching Innovation.

- 90% of respondents considered these activities useful as teaching-learning methods (Table 1).
- 86.7% and 3.3% responded that they were “very satisfied” and “satisfied,” respectively, with the gamification of the “Pasapalabra” game to meet the learning outcomes.
- 86.6% indicated that their prior knowledge was enriched thanks to this methodology, with 83.3% choosing the “very satisfied” option.

Dimension 3. Resources.

- 83.3% of respondents were “very satisfied” with the resources used, and 3.3% were satisfied.
- Regarding the length of each game, 76.7% were "very satisfied" and 10% were "satisfied." Ten percent of respondents were "dissatisfied" (3.3%) and "very dissatisfied" (6.7%).
- Ninety percent of students chose the options “very satisfied” (86.7%) and “satisfied” (3.3%) regarding the clarity of the instructions given at the beginning of each game.

Table 1. Percentage distribution of the level of satisfaction of nursing students according to the usefulness of using the Pasapalabra Game as a teaching-learning strategy

Level of Satisfaction	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Very Dissatisfied	2	6.7	6.7	6.7
Dissatisfied	1	3.3	3.3	10.0
Satisfied	3	10.0	10.0	20.0
Very Satisfied	24	80.0	80.0	100.0
TOTAL	30	100.0	100.0	

Figure 1. Total satisfaction level with the "Pasapalabra" game

Qualitative analysis.

A phenomenological design was applied to explore students' perceptions and experiences with gamification through the game "Pasapalabra." This approach allows us to understand how participants experience and make sense of this innovative methodology in their educational context. Qualitative data collection was conducted through an open-ended question included at the end of the satisfaction questionnaire, inviting students to share their comments, suggestions, and experiences regarding the gamified activity. Fifty percent of respondents responded to this question. To ensure the validity and reliability of the qualitative data, the following strategies were implemented:

1. Researcher Triangulation: Three researchers participated in data coding and analysis to reduce individual bias and increase the credibility of the findings.
2. Peer Review : The results were reviewed by experts in qualitative methodology and education to ensure consistency and accuracy of interpretations.
3. Data Saturation: This was reached when no new themes or categories emerged in the responses, indicating that the diversity of experiences and perceptions had been captured.
4. Data Audit: A detailed record was kept of all stages of the content analysis to allow for external auditing and ensure transparency of the process.

Content analysis was carried out following the scheme proposed by Miles and Huberman, which includes three levels of data reduction:

1. Initial Coding: Student responses were read and inductively coded to identify emerging themes and patterns. Each response was segmented into units of meaning, and codes were assigned to these units.
2. Code Grouping : Codes that shared similar characteristics were grouped into thematic categories. This process allowed the information to be organized and synthesized in a coherent manner.
3. Development of Metacategories and Domains : From the thematic categories, metacategories were developed that represented broader concepts. These metacategories were ultimately integrated into a master domain reflecting the pedagogical evaluation and improvement of gamification.

The six emerging categories were as follows (Table 2):

1. Assessment of the methodology : viewed very positively, considering it educational and effective, as it reinforces theoretical learning in an entertaining and active way: "The activity was very

entertaining," "The methodology was very educational," "It breaks away from the norm." This approach, combined with the teachers' creativity, fostered a more dynamic and participatory learning environment: "It was innovative and very participatory; it was entertaining."

2. Interactivity and participation : Student participation and the fun of the methodology were highlighted, which facilitated knowledge retention in a less conventional way: "It was a very pleasant experience, where I was able to learn content and at the same time have a good time, laugh and sing", "more attractive and didactic to reinforce what was learned in theory with games and imitations", "novel and very participatory".
3. Satisfaction with the activity: Students indicated that the learning acquired was significant, mentioning that the methodology allowed them to consolidate their knowledge effectively: "it allows them to acquire and put knowledge into practice in a much more didactic way", "I found it to be very enriching for my learning", "it was enriching to use this methodology to deepen the knowledge acquired, in addition to the fact that it is satisfactorily remaining as learning".
4. Improvement proposal: suggestion to allow more time for answers in the roulette game, which could improve the dynamics and give students more space to reflect and participate effectively: " Give a little more time to answer in the roulette game, and be able to complete the wheel to learn and reinforce more", "more time to be able to complete the wheel, we lacked time".
5. Appreciation for creativity : Students thanked the teachers for the creativity they used in the activities. This innovative approach was considered an excellent way to facilitate learning, differentiating itself from traditional methods: " The teachers' creativity is appreciated," "Thank you for the way you provide knowledge and tools to acquire it in the best possible way," "Super innovative."
6. Suggestion for future subjects : desire to see these methodologies applied in other curricular activities, which shows a high appreciation for the strategies used and the desire to continue learning in a similar way in the future: " It would be great if methods like this were implemented in other future subjects."

These categories were grouped into two metacategories: appreciation of the methodology and recommendations, which formed the domain of evaluation and pedagogical improvement.

This qualitative analysis reflects a positive and enriching learning experience, centered on gamification as an innovative methodology, using the game "Pasapalabras," which served to reinforce theoretical concepts. The comments highlight several key aspects that made the experience highly engaging for students.

Table 2. Levels of qualitative analysis, scheme proposed by Miles and Huberman

Domain	Metacategory	Category
Pedagogical evaluation and improvement	Appreciation of the methodology	Assessment of the methodology
		Interactivity and participation
		Satisfaction with the activity
		Appreciation for creativity
	Suggestion for future subjects	Proposal for improvement
		Suggestion for future subjects

4. Discussion.

Since the implementation of the current curriculum in 2014, fourth-year students have found the neonatology unit challenging due to new concepts, terms, and pathologies, resulting in lower performance on the summative assessment compared to other units. To address this difficulty, new teaching innovation strategies have been sought, such as gamification with the game "Pasapalabra." Comparing the results with previous classes that did not use this strategy, the failure rate on this assessment was higher than 55%. In the 2022 and 2023 classes, where this strategy was applied, the failure rate decreased to 34.3% and 41.2%, respectively. Although these results are preliminary and

other factors need to be investigated, they are consistent with a study in the Law program at the University of Lleida, where gamification increased student performance by 15% (18).

Gamification has proven to be a useful tool for reinforcing content, promoting more fun and meaningful learning (3, 7, 9-14). This study, using the game "Pasapalabra," showed that students rated this strategy with a score of 4.57 out of a maximum of 5.0. The level of satisfaction obtained coincides with authors such as Colón, Jordán, and Agredal (19), who conclude that gamification makes educational activities "more motivating and stimulating." Ninety percent of those surveyed in this research report that it is an effective innovation strategy for their teaching-learning process.

For Gudiño, Bolaños, Melo, Pazmiño and Rosero (4), gamification is effective in increasing classroom participation, motivating both teachers and students, improving the learning environment and making classes more welcoming. The students in this study agreed with these authors, describing the activity as “very entertaining”, “excellent methodology”, “novel and very participatory”. This study confirms the benefits of using games in the classroom as a methodological strategy, also applicable in the university context (4, 8, 20).

Several authors point out that this methodology has a significant impact on education, improving both learning and understanding of complex topics, as well as student motivation and engagement (20-22). Opinions such as "it was enriching to use this methodology to deepen the knowledge acquired" and "it allows us to acquire and put knowledge into practice in a much more didactic way" reinforce these authors' statements.

When a person has fun doing an activity, the acquired information is retained in the brain, leading to optimal learning. To achieve this, it is crucial to use innovative methodologies that spark student interest and motivation (23). In this study, 90% of students rated the implementation of gamification as satisfactory or very satisfactory, and they enjoyed the experience and reinforced their knowledge.

Among the study's limitations is the limited amount of research related to the game "Pasapalabra" in the university setting. Although there are studies on gamification in general, they are not yet widespread. There is also a lack of studies that demonstrate the real impact of these methodological strategies on academic performance; these focus more on student opinions. Another important aspect was the initial confusion between the concepts of gamification and game-based learning (GBL), as they are similar in some respects. The game "Pasapalabra" can be considered one or the other methodology depending on its use.

Another limitation was the sample size (30 students, out of a total of 32), which may limit the generalizability of the results. A larger sample size could provide more robust and representative results. Furthermore, the descriptive cross-sectional design used in the quantitative phase does not allow for establishing causal relationships between gamification and academic performance. Future studies could benefit from a longitudinal design to evaluate the long-term effects of gamification on learning and include control groups to compare gamification with traditional teaching methods.

It is suggested that this game be implemented in a university academic context and that further studies be conducted, including the teachers' perspectives, assessing their satisfaction and the challenges they face, for example, through a qualitative approach.

5. Conclusions.

- Gamification, when applied correctly, can be a powerful tool in higher education. This study shows that the use of games like "Pasapalabra" significantly increases student satisfaction and can improve motivation and academic performance.
- The analysis of the results reveals a positive learning experience, with the innovative methodology and active participation being the most notable aspects. Feedback suggests that students felt motivated, engaged, and satisfied with their learning.
- In past generations, poor academic performance was observed in the Neonatology Unit due to the complexity of new concepts and pathologies. In the classes that used the "Pasapalabra"

game (2022 and 2023), academic performance improved, reducing failure rates by between 10% and 20%. Although this study only evaluated the satisfaction level of students in the 2023 class, it concludes that further research is needed into the effects of gamification on academic performance.

- In general, university studies agree that gamification increases student motivation. However, studies from the academic perspective are lacking. It has been observed that gamification requires more teaching time to develop questions and plan games, but the level of satisfaction of those responsible for implementing these strategies is unknown.
- This study suggests that gamification can be an effective strategy for improving higher education. However, further research is needed, including faculty perspectives, academic performance, and comparisons with other methodologies.

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