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Bridging Theory and Practice through Business Games: A Quantitative Study of Perceived Usefulness and Satisfaction

Conectando Teoria e Prática or Meio de Jogos de Empresas: Um Estudo Quantitativo sobre Percepção de Uso e Satisfação

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Abstract

Business games, as active learning strategies, have been used for their ability to integrate theory and practice, stimulate decision-making, and promote socio-emotional competencies. Studies analyzing the perception of use and student satisfaction with these tools in the learning process are still scarce. This study investigates responses from students of a public institution, using structural equation modeling using the PLS-PM technique. The results reveal a significant correlation between the perception of use and satisfaction, highlighting the support for doubts, the practical applicability of the theory, and the accessibility of the platform as key determinants. The study contributes to the understanding of two elements that potentiate engagement and pedagogical effectiveness in business simulations, reinforcing the importance of media and technological usability.

Keywords: Business games. Active learning. Perceived usefulness. Satisfaction.

Resumo

Os jogos de empresa, enquanto estratégias de aprendizagem ativa, têm sido

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utilizados por sua capacidade de integrar teoria e prática, estimular a tomada de decisão e promover competências socioemocionais. Estudos que analisem como a percepção de uso e a satisfação dos estudantes no processo de aprendizagem com essas ferramentas ainda são escassos. Este estudo investigou as respostas de estudantes de uma instituição pública, utilizando modelagem de equações estruturais por meio da técnica PLS-PM. Os resultados revelaram correlação significativa entre percepção de uso e satisfação, destacando o suporte a dúvidas, a aplicabilidade prática da teoria e a acessibilidade da plataforma como fatores determinantes. O estudo contribui para a compreensão dos elementos que potencializam o engajamento e a efetividade pedagógica em simulações empresariais, reforçando a importância da mediação e da usabilidade tecnológica.

Palavras-chave: Jogos de empresa. Aprendizagem ativa. Percepção de uso. Satisfação.

Introduction

In modern society, the use of digital devices and social media platforms has become an integral part of daily activities. These technologies have brought convenience, connectivity, and speed, but they have also impacted brain functions and cognitive abilities (Shanmugasundaram; Tamilarasu, 2023). The continuous increase in exposure to electronic devices, particularly social media, has led to a decline in the ability of young people and adults to maintain sustained attention for extended periods. This reduction in attention capacity may be associated with a decline in academic performance and difficulties in engaging in professional activities in the future of these young people and adults (Carvalho, 2020; Rodrigues *et al.,* 2023; Silva *et al.*, 2025).

The search for alternative teaching methods aims to address specific gaps left by traditional methods, which often focus more on skills that are not highly valued by the current generation, such as passive memorization. In this context, active methodologies, such as simulations and games, stand out because they facilitate greater student participation and engagement with the covered content, resulting in increased motivation and the development of problem-solving skills (Barbetta, 2023; Cunha *et al.*, 2024; De Assis Silva; Santos; Santos, 2024).

Teachers and educators use games in school environments as one of the strategies of active methodologies, which take shape through gamification. In Brazil, the use of business games in school environments, although providing a set of practical lessons, remains moderate. A study conducted in Bahia found that 44.7% of the state's educational institutions applied games for the training of administrators (Motta; Quintella, 2012). A survey of 108 students in Computer Science courses across 10 Brazilian states revealed that only 29.6% had experience with simulation teaching during their undergraduate studies (Rodrigues; Neto, 2025). On the other hand, studies have shown that effective gamification yields numerous positive results. For example, 97% of public servants who participated in a study perceived gamification as a positive strategy, and 92% reported greater engagement compared to traditional courses. Furthermore, 86% had a greater understanding of the content, and 73% indicated symbolic competition as a motivating factor (Melo *et al.*, 2023). These data show that, although some institutions

use games, researchers have explored few tools and conducted a limited number of studies evaluating user perception.

The literature is replete with studies that evaluate the effectiveness of various teaching methods. Some of these studies correlate learning outcomes with satisfaction with the method used or with other factors related to the teaching and learning process. However, studies in the literature are scarce that seek to identify the factors in the educational experience that most contribute to student satisfaction.

Thus, although educators widely use business games as pedagogical tools, researchers have conducted few studies that analyze students' subjective experiences with these games, especially the perceived usefulness, which also influences their satisfaction with the learning process.

In research on simulation and business games, the primary focus of studies remains on the relationship between the teaching method and learning. However, a lack of evaluation of the user experience and its relationship with student satisfaction remains, indicating a need for further contributions in this area (Ferreira; Gonzalez-Gonzalez; Adamatti, 2021; Faisal *et al.*, 2022). Thus, the objective of this study was to evaluate students' perceived usefulness and satisfaction during the learning experience with the business game in order to understand the correlation between students' perceptions of the tool and their level of satisfaction with the educational experience.

Business Simulation and Business Games in Education: Active Strategies for Learning

The search for quality academic training aligned with the needs of organizations has led educational institutions to use support tools in the development and improvement of knowledge, skills, and competencies (Tan *et al.*, 2021). To this end, the use of active learning and educational technologies has become increasingly important, and many institutions have been expanding their virtual education strategies, prompting a deeper examination of the possible contributions of business simulation games (Ferreira; Gonzalez-Gonzalez; Adamatti, 2021). Despite the convergences regarding the formative value of these resources, the authors still diverge regarding the critical success factors. Tan *et al.* (2021) emphasize practical competence as a central focus, and Ferreira *et al.* (2021) emphasize the importance of technological mediation and the interactive interface.

Active learning is an educational approach that actively engages students in their learning process through collaboration, discussions, and problem-solving. It is an instructional method that engages students in practical situations that require

critical thinking, autonomy, and decision-making skills (Crisol-Moya; Romero-López; Caurcel-Cara, 2020; Dos Santos; Da Silva Moreira, 2025). It involves allowing students to communicate, build, experiment, interact, investigate, question, produce, and participate while expressing and sharing their opinions and ideas (Børte; Nesjeb; Lillejord, 2023; Sukackė *et al.*, 2022). It involves student-centered teaching practices, with active engagement in the design of lessons, construction of materials, reflection, and posing questions with the aim of approaching real-world applications. With these actions, they construct their learning (Van den Beemt *et al.*, 2023). However, although there are several benefits, studies such as those by Børte, Nesjeb, and Lillejord (2023) also identify institutional and cultural barriers to its implementation, especially in more traditional teaching contexts.

Active student participation requires the implementation of active methodologies, both in the educational process and in the mechanisms for assessing the degree and quality of the learning acquired (Crisol-Moya; Romero-López; Caurcel-Cara, 2020). Educators have gradually moved away from relying solely on lectures and have begun combining them with other methodologies, such as seminars, learning projects, supervised projects, readings, reviews, document analysis, case studies, bibliographic research, problem-based learning, project-based learning, peer learning, gamification, flipped classrooms, virtual platforms, practical class sessions, among others (Berssanette; de Francisco, 2021; Crisol-Moya; Romero-López; Caurcel-Cara, 2020). These activities promote greater student involvement, favoring active learning, the development of socio-emotional skills, and content retention. Active learning does not negate the importance of lectures but expands the scope of student action, allowing analysis, reflection, synthesis, and more effective communication (Lombardi *et al.*, 2021).

Active learning methodologies bring new perspectives to teaching and learning, providing access to content that would not be explored by students using traditional methods or if explored, would not have as much meaning. In active learning methodologies, the greater the student's involvement in activities and practices, the greater their ability to understand the subjects (Ghezzi *et al.*, 2021; Júnior; Leite, 2025). Active methodologies encompass a variety of teaching strategies, including Problem-Based Learning, Project-Based Learning, Peer Instruction, Writing Across the Curriculum (WAC), Gamification, Flipped Classrooms, and others (Hübner; Modesto, 2020; Lovato *et al.*, 2018). Although the literature points to their positive effects on learning, few studies empirically compare which of these methodologies are most effective in specific contexts, such as technical education or management training.

Educational games, as active learning tools, integrate theory and practice, promote engagement, and develop skills, competencies, and knowledge among participants (Barbetta, 2023). With the advancement of technology, game-based learning has gained strength, primarily through serious games, which are applied in simulations and business games (Dimitriadou *et al.*, 2020). These games are designed with defined pedagogical objectives, practical challenges, and continuous feedback on participants' performance (Maxim; Arnedo-Moreno, 2025). They are immersive and interactive environments that reflect real-world situations, providing students with a meaningful and engaging experience (Beranič; Heričko, 2022). Such environments also facilitate experiential learning, in which error is understood as an essential part of the formative process rather than a failure, encouraging students to explore, test, and reflect on their decisions. Furthermore, serious games foster the development of skills such as collaboration, resilience, empathy, and critical thinking (Martel-Santana; Martín-del-Pozo, 2025) and promote greater retention and creativity in problem-solving (Tan; Nurul-Asna, 2023). However, the literature indicates the need for a more in-depth analysis of the game design elements that most contribute to these results. While Beranič and Heričko (2022) highlight the realism of simulations as a key factor, some emphasize the role of adaptive feedback and engaging narrative (Dimitriadou *et al.*, 2020).

Despite the benefits associated with business games and business simulations, their implementation in education still faces significant challenges (Dimitriadou *et al.*, 2021). Barriers, including limited infrastructure, teacher resistance to innovation, and the longer time required to plan and conduct these activities, hinder their adoption (Fonseca *et al.*, 2021). The effectiveness of games depends directly on teacher training, which must involve mastering the content, understanding the game's dynamics, and facilitating the active learning process (Hallé Petiot *et al.*, 2021). Additionally, many institutions face technological limitations or limited access to digital platforms in regions with lower connectivity (Atabek, 2019). Another challenge is assessing learning in playful environments, as traditional criteria do not always accurately capture the development of cognitive, practical, and socio-emotional skills (Zhu; Guo; Yang, 2022). Therefore, it is essential to utilize specific assessment instruments tailored to gamified environments, including competency-based assessment, self-assessment, and peer assessment.

Therefore, for business games to fulfill their pedagogical potential, it is necessary to consider these obstacles and plan institutional support actions, teacher training, and adaptation of assessment methods (Dimitriadou *et al.*, 2020).

Reasearch Methods

This section outlines the methodological procedures adopted, from conception and planning through execution and conclusion of this research. Therefore, we divide the section into types of research, sample, instrument, data collection, data processing, and limitations of the method. Figure 1 presents the research stages in diagram form.

Figure 1: Research Steps

Source: Authors' elaboration

Type of Research, Sample, and Data Collection Instrument

Initially, it is important to emphasize that this research belongs to the broad area of knowledge of "Human and Social Sciences," which, according to the National Health Council (Conselho Nacional de Saúde – CNS, 2016), via Resolution No. 510/2016, in its Art. 1, sole paragraph, establishes the standards applicable to research in this area, and states the following: "the following will not be registered or evaluated by the CEP/CONEP system: item I - public opinion research with unidentified participants." Therefore, it is understood that this research meets the criteria established by the aforementioned resolution.

Therefore, the research does not present any ethical risks associated with the processing of sensitive data, participant privacy, or informed consent, as all data used are from a public opinion survey with anonymous participants.

Creswell (2007) characterizes this research as:

- basic and applied in nature, with a bibliographic survey in scientific articles and books that deal with the subject, in addition to carrying out a field survey;
- quantitative approach, by applying a research questionnaire to a sample of 41 respondents;
- exploratory objectives, to establish familiarity with the research problem, involving a bibliographic survey and formulation of hypotheses, and descriptive, as it uses standardized techniques for data collection and describes characteristics of a phenomenon;
- procedures, it is bibliographic and documentary research, followed by field research.

In 2023, a total of 105 students from technical and higher education courses at a particular educational institution participated in the business simulation project known as "Business Games." Of these, 60 students participated in the first semester, and 45 participated in the second semester of 2023, as recorded via Google Forms at the end of each semester. A total of 41 valid responses were obtained, representing approximately 40% of the total participants in the project, thus forming the sample for this research.

For the primary data collection instrument, the researchers defined a structured script (Lakatos; Marconi, 1991) divided into three parts:

The first part refers to the characterization of the respondents, providing information on their gender, age group, and course.

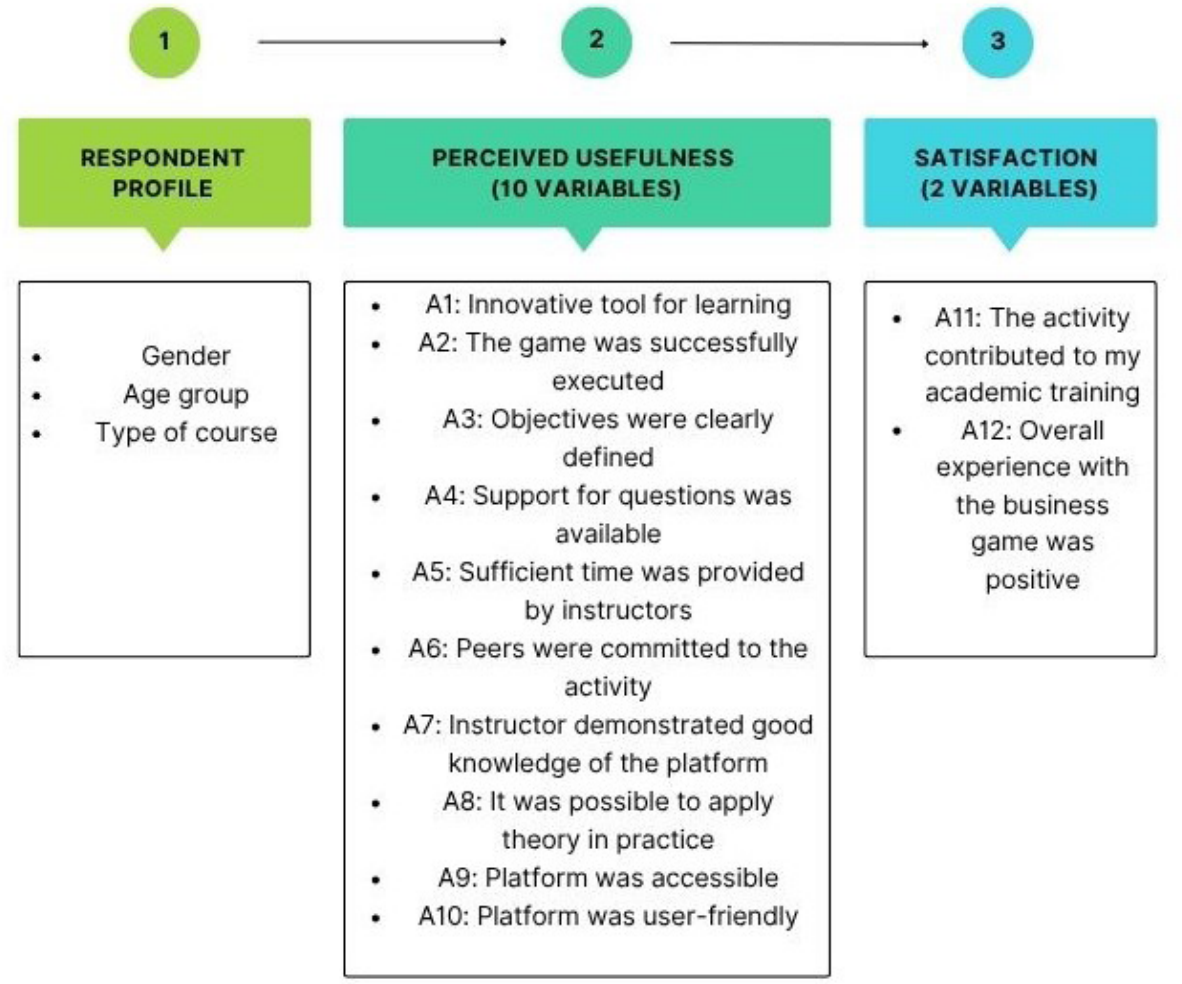
The second part addressed the 12 (twelve) assertions related to the perceived usefulness and satisfaction with the business simulation experience. The respondents evaluated one assertion at a time, using a six-point scale: completely unsatisfactory (1),

unsatisfactory (2), indifferent (3), satisfactory (4), completely satisfactory (5), and the option "I prefer not to give an opinion".

The third part presented an open question: "If you wish, leave additional comments below about your experience with the Business Game."

Figure 2 illustrates the assertions of the empirical model and its breakdown into constituent measures.

Figure 2: The empirical model with its research assertions



Source: Authors' elaboration

This study defines three sets of measures:

a) **characterization of respondents:** three variables (gender, age group, and type of course);

b) **perceived usefulness**: 10 variables, including: "innovative tool for learning (A1)", "game execution was successful (A2)", "well-defined objectives (A3)", "support for questions (A4)", "time made available by teachers (A5)", "commitment of colleagues (A6)", "teacher knowledge (A7)", "possibility of applying theory in practice (A8)", "access to the platform (A9)" and "accessibility of the platform (A10)";

c) **satisfaction:** two variables: "contribution to academic training (A11)" and "general experience with the game (A12)".

Data Processing

To analyze the collected data, a descriptive analysis was conducted to identify any atypical observations or extreme responses. This step aimed to verify whether such values resulted from input errors or omissions on the part of the respondents in order to avoid undue influence on the results of the multivariate analysis.

After the initial examination, debugging was conducted using multivariate analysis, specifically exploratory factor analysis (EFA), to identify the underlying structure of the data matrix (Malhotra, 2012).

To validate the generated factor structure, the following statistical indicators were used:

a) **Cronbach's Alpha:** Indicator used to measure the reliability or internal consistency of questionnaire or scale items. his indicator checks how much items in the same dimension are correlated with each other, ensuring that they measure the same concept. According to Hair *et al.* (2019), Cronbach's Alpha values range from 0 to 1, where– ≥ 0,9 → Excellent reliability; 0,8 - 0,89Good reliability; 0,7 - 0,79 → Acceptable; 0,6 - 0,69 → Questionable; e < 0,6Low reliability.

b) **Average Variance Extracted (AVE):** an indicator used to assess convergent validity in structural equation modeling analyses. This indicator measures the proportion of the total variance of a construct explained by its indicators compared to the error variance. According to Fornell and Larcker (1981), it can be interpreted as follows - Values ≥ 0.50 - Indicate good convergent validity (the construct explains at least 50% of the variance of its items). Moreover, Values < 0.50 suggest that there is more error than explained variance, which may indicate problems with the scale or the definition of the items.

Composite Reliability (CR): statistical indicator that measures the internal reliability of a set of items that make up a construct in structural equation models The interpretation of CR suggests that **≥ 0,7** - Acceptable reliability; **≥ 0,8** - Good reliability; **≥ 0,9** - Excellent reliability (Hair, *et al.*, 2019).

After validating the structure of the theoretical-empirical model, structural equation modeling was used to assess the statistical significance of the interrelationships between variables, employing the PLS-PM (Partial Least Squares - Path Method) technique. The SmartPLS Professional software was chosen because it allows the estimation of complex models, dispenses with data normality requirements, requires smaller sample sizes, and is freely available (Ringle; Wende; Becker, 2023).

Furthermore, the bootstrapping technique with 5,000 repetitions was used to assess the statistical significance of the structural paths, as recommended by Hair *et al.* (2019), reinforcing the robustness of the inferences, even with a limited sample size.

Methodological Limitations

The limitations of the research method involved some notable factors, such as:

a) a) sampling and research subjects, since the data collection was carried out with a single group of technical and higher education students from a single educational institution; which may compromise the generalization of the results;

b) b) time frame, about the period during which the research was carried out, as the data were collected cross-sectionally during the first and second semesters of 2023, which did not allow for the analysis of seasonal or evolutionary variations in the participants' perceptions over time. The results obtained should be viewed with reservations.

Furthermore, the choice of the convenience method and the non-randomness of the sample may have introduced selection bias, limiting the statistical robustness of the results. The lack of comparison with control groups or other institutions also restricts the extrapolation of the results to broader contexts. Finally, the use of self-report as an instrument may be subject to social desirability bias, with a tendency for participants to respond more favorably to the experience.

Research Results and Discussion

This section presents and discusses the main findings of the research based on the bibliographic survey and field research conducted. Thus, the study divides the section into: a) characterization of the sample, b) validation of the scale and construct, and c) evaluation of the structural relationships of the measurement model. The aim is to interpret the data in order to identify trends, challenges, and contributions to the use of business games as a pedagogical tool.

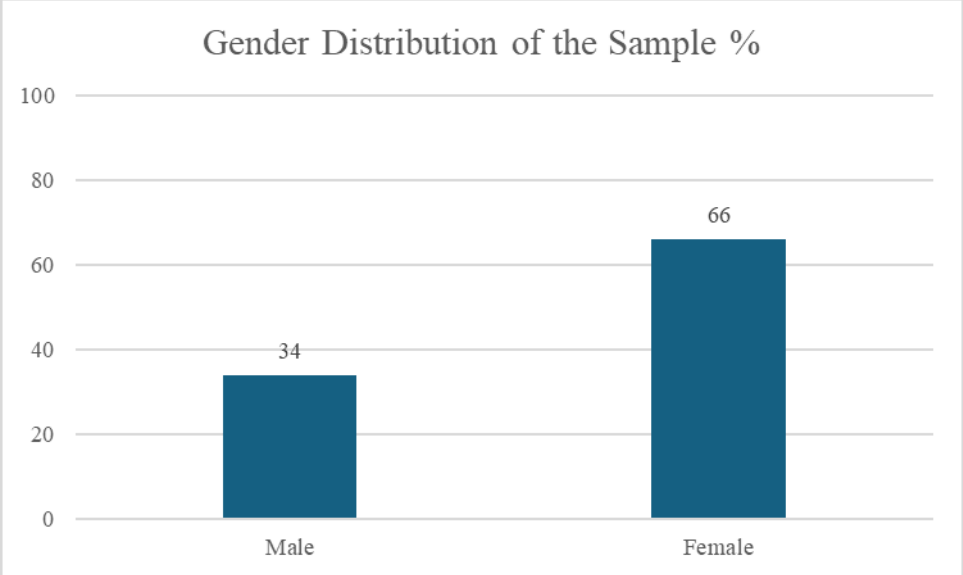
Sample Profile

The research sample consisted of 41 respondents. The representativeness of the sample is consistent with the universe of participants of the institution, although with limited numbers. The profile of the respondents is important for contextualizing the results, considering factors such as age range and type of course, which can influence

how business games are perceived. Thus, the sample presented the following characterization:

Sample distribution by gender: among respondents, 34% identify as male and 66% as female.

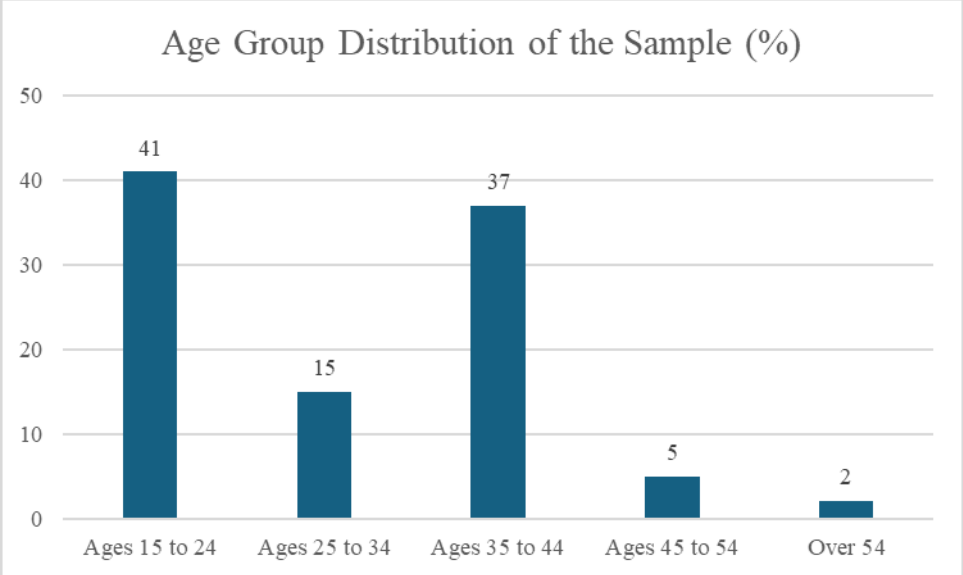
Figure 3: Gender Distribution of the Sample (%)



Source: Authors' elaboration based on research data (2023).

a) **Distribution of the sample by age group**: Of the respondents, 41% are aged between 15 and 24 years; 15% are aged between 25 and 34 years; 37% are aged between 35 and 44 years; 5% are aged between 45 and 54 years; and finally, 2% are aged over 54 years.

Figure 4: Age Group Distribution of the Sample (%) (%)

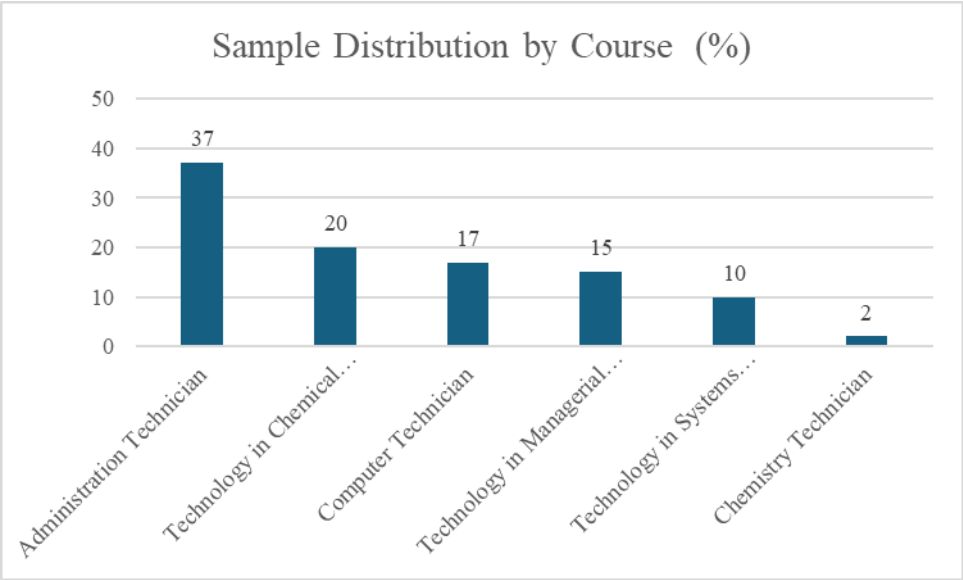


Source: Authors' elaboration based on research data (2023).

b) **Distribution of the sample by course:** Of the respondents, 17% are studying Computer Technician integrated into high school;

37% are studying Administration Technician integrated into high school (PROEJA); 15% are studying Technology in Chemical Processes; 2% are studying Chemistry Technician C/S; 20% are studying Technology in management processes; and 10% are studying Technology in Systems Analysis and Development.

Figure 5': Sample Distribution by Course (%)



Source: Authors' elaboration based on research data (2023).

The diversity of courses represents different areas of knowledge, which can enrich the analysis of the business game experience from various educational perspectives.

The results obtained are consistent with the profile of students in technical and higher education courses at the investigated educational institution. Even so, the predominance of students in integrated technical courses can influence the general perception of the applicability and usability of the simulated platforms.

Scale and Construct Validation

During the construction of the descriptive analysis of the data, the statistical measure of excessive kurtosis was verified, which indicates a distribution with heavier tails than usual, suggesting a greater probability of extreme values in the sample. The values found were 10.445 for the construct of perceived usefulness and 6.562 for the construct of satisfaction.

Still, on the distribution of data, the asymmetry indicator (skewness) shows values of 2.522 and 2.786 for the construct's perceived usefulness and satisfaction, respectively, indicating a positive asymmetry, that is, the right tail of the distribution is longer, indicating that the sample has high extreme values in the sample.

These results reinforce the suitability of using the PLS-PM technique, which is robust to violations of data normality (Hair *et al.*, 2019).

The Cramér-von Mises statistical tests indicate that there is no significant difference between the empirical distribution function (EDF) of the sample and the theoretical distribution function (F), as shown in Table 1.

Table 1: Descriptive Data Validation

	Excess kurtosis	Skewness	Number observations used	Cramér-von Mises test statistic	Cramér-von Mises p value
Perceived usefulness	10,445	2,522	41,000	0,511	0,000
Satisfaction	6,562	2,786	41,000	2,344	0,000

Source: Authors' elaboration based on research data (2023).

Following the statistical validation of the data, Cronbach's Alpha was 0.838, indicating good reliability of the data. In the Composite Reliability (CR) tests, values above 0.800 were obtained, which also suggests good reliability. The Average Variance Extracted indicator yielded a value of 0.859, indicating good convergent validity (Hair *et al.*, 2019), as detailed in Table 2.

Table 2: Validation of the Multivariate Analysis

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Satisfaction	0,838	0,884	0,924	0,859

Source: Authors' elaboration based on research data (2023).

Although the data on perceived usefulness and satisfaction showed high asymmetry and kurtosis, reliability and convergent validity tests demonstrated that the indicators maintained satisfactory internal consistency.

Despite the acceptable convergent validity and reliability, it is recommended that future applications of the instrument consider reviewing items with lower loadings for the construct perceived usefulness in order to optimize the model.

In addition, it would be interesting in future studies to perform a complementary exploratory factor analysis (EFA) in larger samples to verify the stability of the instrument's structure and its replicability in different educational contexts.

Evaluation of the Structural Relationships of the Measurement Model

The evaluation of the structural relationships of the measurement model aimed to verify the degree of association between the construct's perceived usefulness and satisfaction in the context of applying the business game as an educational tool. For this purpose, the PLS-PM (Partial Least Squares Path Modeling) technique was employed,

which is recommended for small samples and data that do not meet the assumptions of normality (Hair *et al.*, 2019).

Regarding extreme loads, understood as the degree of correlation between each observed variable and its respective latent factor (Ringle; Wende; Becker, 2023), the results indicate that the values of assertions "A9 (access to the platform) and A10 (accessibility of the platform)" presented a strong correlation with the construct perceived usefulness, with values above 0.70, indicating that the technical usability of the platform significantly impacted the student's perception of the experience with the game. In addition, assertions "A11 (impact on academic training) and A12 (general experience)" also presented high correlation coefficients (0.947 and 0.906, respectively), which demonstrates the relevance attributed by the participants to the experience with business games. These values are shown in Table 3. This result suggests that students recognized business games as a significant educational experience. The assertion "A7 (teacher's knowledge about the platform)" also presented a moderate correlation, reinforcing the importance of teacher mediation in the simulation's effectiveness.

The assertions "A1 (I have had previous experience with business games in other disciplines), A2 (I have ease in using educational technologies) and A3 (I consider myself familiar with business simulation platforms)" presented negative correlations with the construct perceived usefulness. This result may indicate that, although these items are included in the investigation, they were not perceived by the respondents as part of the experience with the game, which suggests the need to reevaluate these dimensions better to align them with the objectives of the simulation activity.

Table 3: Variable Correlations

#	Perceived usefulness	Satisfaction
1	-0,009	
2	-0,049	
3	-0,077	
4	0,208	
5	0,347	
6	0,036	
7	0,463	
8	0,342	
9	0,719	
10	0,722	
11		0,947
12		0,906

Source: Authors' elaboration based on research data (2023).

Regarding the analysis of the coefficient of determination (R^2), the adjusted value was 0.508, indicating that the model explains a portion of the variation in the satisfaction construct, as shown in Table 4. This value presents a moderate level of

explanation. This result is consistent with research applied in educational contexts since multiple factors can influence participants' perceptions (Hair *et al.*, 2019).

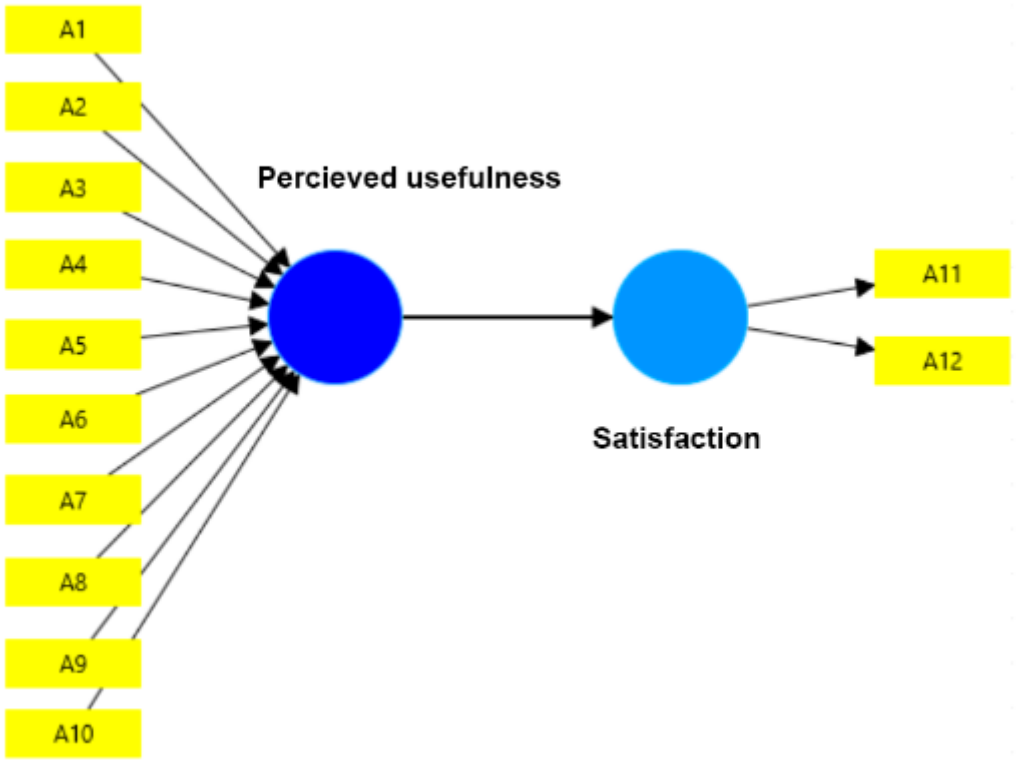
Table 4: Coefficient of Determination

	R-square	R-square adjusted
Satisfaction	0,521	0,508

Source: Authors' elaboration based on research data (2023).

Figure 6 shows the results of the statistical significance of the measurement model relationships.

Figure 6: Theoretical-Empirical Model



Source: Research data, based on the model estimated using SmartPLS software – Significance: bootstrap with n = 41 and 5,000 resamples.

Data purification through structural equation modeling indicated the relevant statistical significance of the interrelationships in the variables "A4 (support for questions), A8 (application of theory in practice) and A10 (platform accessibility)" with the construct of perceived usefulness, in addition to the variables "A11 (impact on academic training) and A12 (general experience)", in the satisfaction construct, using the PLS-PM technique (Ringle; Wende; Becker, 2023).

The bootstrapping technique with 5000 provides statistical robustness to the results obtained, even with reduced samples, recommended in PLS-PM modeling to assess the significance of structural paths (Hair *et al.*, 2019).

With the results of these analyses, the following variables (research statements) stand out (research statements): "support regarding doubts about how the game works (A4)"; "by participating in the business game it was possible to put the theory into practice (A8)"; and "accessibility of the business game platform (A10)", as determinants for a positive correlation between the perceived usefulness and satisfaction with the experience of using the business simulation platform – business games.

This reflection is also evident in the satisfaction measures, with a positive correlation between the statements "participating in the business game contributed positively to my academic training (A11)" and "the general experience of participating in the business game (A12)".

The results confirm the theoretical hypothesis that the perception of usability influences student satisfaction, as discussed by Ferreira, Gonzalez-Gonzalez, and Adamatti (2021), who highlight the importance of user experience in educational simulations.

These variables, by directly impacting the perceived usefulness, demonstrate that the effectiveness of business simulations depends not only on the technology used but also on institutional support and the connection between theory and practice. Variable A8 (application of theory in practice) reinforces the premise that business games function as bridges between theoretical knowledge and real-world application, one of the pillars of active methodologies.

Concluding Remarks

The study aimed to investigate students' perceived usefulness and satisfaction regarding their experience with the business game applied as an active learning tool. Through the PLS-PM statistical technique, it was possible to identify the relationship between the construct's perceived usefulness and satisfaction, demonstrating significant correlations between the variables analyzed.

The results of the analyses highlight the importance of key aspects in the user experience with the business simulation platform. The strong correlation between the perceived usefulness and satisfaction highlights that factors such as support for questions (A4), the practical application of theory (A8), and the accessibility of the platform (A10) were decisive for a positive experience. This relationship is directly reflected in the satisfaction indicators, where participants acknowledged that the

experience in the game significantly contributed to their academic training (A11) and provided an overall positive experience (A12). These results underscore the importance of an accessible interface and efficient support in enhancing learning in simulation environments.

It is essential to note that the teacher's knowledge of the platform was also crucial, underscoring the importance of pedagogical mediation for the activity's effectiveness. This result underscores the importance of teacher preparation and training in utilizing these tools within the educational context.

Despite the promising results, this study has several limitations, including a small sample size, convenience sampling, and a focus on a single institution, which may restrict the generalizability of the results. Additionally, the research employed a cross-sectional design, collecting data at a single time point, which limits the analysis of possible variations over time.

Finally, for future research and investigations, it is recommended: a) to develop a computational model with different simulation cycles, allowing the evaluate the impact of changes in the control variables on the constructs; b) to replicate the study in different national educational institutions over time, individually analyzing the effects of the variables in a series of studies, allowing a comparison between the institutions; c) to include indicators that evaluate cognitive aspects (decision making, application of concepts and logical reasoning) and socio-emotional aspects (collaboration, engagement and resilience) to understand the impact of business games on learning.

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