

Gamification in Higher Education for the Development of Soft Skills: a Systematic Literature Review

Gamificação no Ensino Superior para o desenvolvimento de Soft Skills: uma Revisão Sistemática da Literatura

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Abstract

The aim of this Systematic Literature Review is to investigate gamification in the development of soft skills in higher education. A search was conducted in the Scopus and Web of Science databases for studies published in the last ten years, in English, Portuguese, or Spanish, up to March 14, 2024. The methodological quality of the studies was assessed using the Joanna Briggs Institute checklist. The synthesis of the results was conducted narratively and quantitatively whenever possible. A total of 37 studies were included, each differing in context, intervention, and methodology. The main effects of gamification include improvements in communication, collaboration, critical thinking, problem-solving, and adaptability. Limitations of the studies include variability in study designs, risk of bias, and inconsistency in the results. The study concluded that gamification has a positive impact on the development of soft skills; however, more robust studies are needed to consolidate the evidence.

Keywords: Higher Education; gamification; soft skills.

Resumo

O objetivo desta Revisão Sistemática da Literatura é investigar a gamificação no desenvolvimento de soft skills no ensino superior. Foi realizada uma busca nas bases de dados Scopus e Web of Science por estudos publicados nos últimos dez anos, em inglês, português ou espanhol, até 14 de março de 2024. A qualidade metodológica foi avaliada pelo checklist do Joanna Briggs Institute. A síntese dos resultados foi narrativa e quantitativa quando possível. Foram incluídos 37 estudos, que variaram em contexto, intervenção e metodologia. Os principais efeitos da gamificação incluem melhorias em comunicação, colaboração, pensamento crítico, resolução de problemas e adaptabilidade. As limitações incluem variabilidade nos desenhos de estudo, risco de viés e inconsistência nos resultados. Conclui-se que a gamificação tem impacto positivo no desenvolvimento de soft skills, mas são necessários mais estudos robustos para consolidar as evidências.

Palavras-chave: Ensino Superior; gamificação; soft skills.

INTRODUCTION

Over the past decades, the educational landscape has undergone substantial transformations driven by technological advancements and the growing demand for competencies that extend beyond technical knowledge. These skills, known as *soft skills*, encompass effective communication, collaboration, critical thinking, problem solving, and adaptability. Such proficiencies are increasingly valued in the modern labor market, which seeks professionals capable of readily adjusting to dynamic and complex environments (Robles, 2012; Succi; Canovi, 2020).

Meanwhile, gamification has emerged as a new pedagogical approach that integrates gaming elements such as scores, levels, rewards, and immediate feedback to engage and stimulate

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Data availability: The research data supporting the findings of this study are available within the article.

Study conducted at Universidade de Marília (Unimar), Marília, São Paulo, Brasil.



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students. In higher education, gamification has been examined not only as a mechanism to increase student engagement and motivation, but also as a productive method to foster indispensable soft skills (Dichev; Dicheva, 2017; Subhash; Cudney, 2018).

By incorporating playful and interactive components into the learning process, gamification provides an atmosphere conducive to enhancing and encouraging soft skills. Through engaging in gamified tasks, learners can refine their communication skills through collaborative exchanges, enhance critical thinking when facing complex challenges, and strengthen resilience and adaptability when confronting and overcoming obstacles, thus building new knowledge (Fotaris et al., 2016; Huang; Hew, 2018; Jorge; Sutton, 2017).

Given the growing importance of soft skills and the potential of gamification as an educational strategy, it is necessary to meticulously examine how these two domains are interconnected in higher education. Although studies have investigated the significance of soft skills and the effectiveness of gamification individually, a gap remains in the literature regarding how gamification can be specifically leveraged to promote these skills within higher education. A Systematic Literature Review (SLR) is essential to consolidate existing insights, identify gaps, and guide future research and pedagogical approaches.

Therefore, the aim of this research is to explore the application of gamification in fostering soft skills in higher education by outlining the main approaches, results, and gaps in ongoing research. Specifically, this SLR aims to address the following subsequent questions: (1) What are the main gamification strategies employed in higher education to foster soft skills? (2) What are the documented findings and repercussions of these strategies? (3) What are the gaps and potential paths indicated by the existing literature?

This research conducted an SLR, adhering to the guidelines PRISMA 2020 Protocol (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) (Page et al., 2021) to explore the use of gamification in higher education for the improvement of soft skills. The SLR aims to assess the implemented gamification approaches, the achieved results and the gaps identified in the existing literature, in order to offer a comprehensive overview of current practices and direct future research and educational implementations.

This study represents a significant advance in understanding the role of gamification for the development of soft skills in higher education by mapping and categorizing the main employed strategies, providing a detailed overview of their applications and impacts. Based on the analysis of 37 studies, we identified emerging patterns and gaps in the literature, which can guide future research and the more effective implementation of these methodologies within academic environments.

Another relevant advance is the identification of the need for more standardized criteria to assess the impact of gamification on the development of soft skills. This SLR highlights the variability in the methodological designs and metrics used, pointing to the importance of more consistent guidelines for measuring findings. This insight can guide future research in the development of more robust assessment instruments.

Finally, this study reinforces gamification as a promising tool for higher education, not only to engage students but also to develop essential soft skills for the 21st century labor market. By consolidating empirical evidence on the impacts of these strategies, our research offers theoretical and practical support for educators, academic administrators and educational policymakers interested in improving learning through innovative approaches.

This article is structured as follows: the next section presents the methodology adopted to carry out this SLR, including the inclusion and exclusion criteria, the databases, and the process of analyzing the studies. Then, in the results section, we describe the main gamification strategies identified, their impacts on the development of soft skills, and the trends observed in the literature. The discussion section contextualizes these findings in light of previous research, highlighting contributions, limitations, and gaps that remain open for future investigations. Finally, the conclusion summarizes the main findings of the study and proposes directions for new research and educational practices.

METHOD

The inclusion criteria for this SLR determined that studies had to investigate the integration of gamification in higher education as a primary intervention, specifically focusing on fostering soft skills among students. The included studies were required to incorporate gamified interventions that promote skills such as optimal communication, collaboration, critical thinking, problem-solving, and adaptability. The review covered empirical research articles, including qualitative studies, as well as systematic reviews and meta-analyses published in the last decade (2014-2024), and accessible in English, Portuguese or Spanish.

The exclusion criteria used in this SLR were studies published more than a decade ago, duplicate studies identified during the screening phase, unavailability of full texts, studies not conforming to the structure of a peer-reviewed article, and studies in languages other than English, Portuguese, or Spanish. Furthermore, studies that did not focus on gamification as a primary intervention in higher education, or those without specific empirical data on soft skills development were also excluded.

The search was conducted on Scopus and Web of Science databases, using a strategy that combined terms related to gamification and the development of soft skills in higher education. To ensure broad coverage of relevant studies, we used Boolean operators, resulting in the string: gamification OR game AND education OR teaching. This choice is justified by the conceptual intersection between gamification and the use of games in the educational process.

Although gamification is based on the application of gaming elements in non-playful contexts, the literature shows that it can benefit from the use of games as a strategic resource to enhance engagement and learning. Models such as *game-based learning* and *serious games* are often associated with gamification, as they share the purpose of making the learning experience more dynamic and effective (Deterding et al., 2011a, 2011b; Gee, 2003; Michael; Chen, 2005). De Carvalho and Coelho (2022) highlight that these approaches are not exclusive, but rather complementary, allowing a gamified process to integrate games as teaching tools (Carvalho; Coelho, 2022). Thus, the inclusion of the term “game” in the search strategy ensured retrieving studies that explore this convergence, expanding the understanding of the gamification impact on the development of soft skills in higher education.

The articles were selected from the databases mentioned above, adapting the keywords to the search engines in each database, applied consistently to titles, abstracts and keywords. The final search date for each source was March 14, 2024.

The inclusion criteria were applied independently by two reviewers, ensuring that the selected studies presented a gamification initiative in higher education as a primary intervention for the development of soft skills. Any discrepancies in the evaluation were resolved by consensus between the reviewers or, when necessary, by a third evaluator, ensuring methodological rigor in the selection of articles.

After study selection, relevant data were extracted and merged according to the SLR objectives. The study selection process followed a three-tiered approach: (1) Title and abstract screening: Two reviewers independently assessed the titles and abstracts of identified studies. Non-relevant studies were excluded at this stage; (2) Full-text assessment: Studies that passed the initial screening underwent full-text assessment to determine final eligibility. Any disagreements between reviewers were resolved by consensus or by a third reviewer's decision; (3) Final inclusion: Studies that met the inclusion criteria were incorporated into the SLR.

Data from each study that met the criteria were collected using a standardized form that documented several details: (1) Specifics about the study identification (such as authors, year of publication, and title); (2) The setting and description of the gamification intervention; (3) The study design and methodology; (4) The metrics used to assess soft skills; (5) Main findings about soft skills improvement; (6) Limitations acknowledged by the researchers.

Data extraction was performed independently by five reviewers, using an Excel spreadsheet to record the collected information. To ensure data accuracy, cross-checking was performed. In cases of disagreement, the reviewers discussed and sought consensus.

The methodological quality of the included studies was assessed using the Joanna Briggs Institute's checklist for qualitative studies (Lockwood; Munn; Porritt, 2015). During the quality assessment phase, two independent reviewers used the checklist for qualitative studies, discussing and resolving any disagreements by consensus. This process helped to ensure that the SLR conclusions were based on robust, high-quality evidence.

The results were summarized in a narrative format, with an emphasis on the used gamification approaches and their impact on the development of soft skills. Differences across the studies were discussed and, when possible, quantitative results were presented in tables to facilitate comparison.

RESULTS

The selection process of the studies followed the PRISMA 2020 method guidelines, as illustrated in Figure 1. Initially, a total of 103 records were identified on the Scopus and Web of Science databases. Out of these, 29 records were removed after eliminating duplicates, 2 articles were excluded for not being in English, Spanish or Portuguese, and 1 article was removed from the selection for exceeding the 10-year time limit.

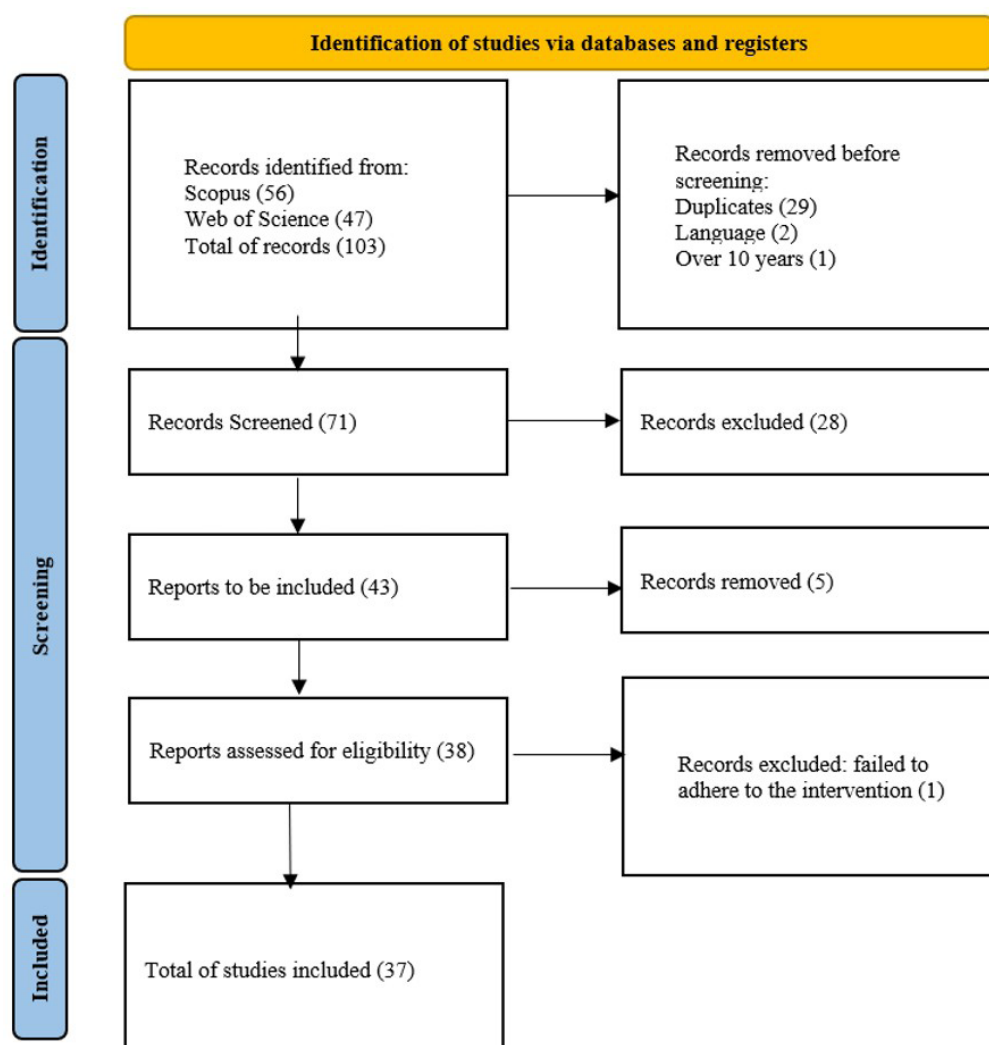


Figure 1. Prisma Flowchart. Source: authors, 2024.

Subsequently, 71 records were evaluated based on titles and abstracts, resulting in the exclusion of 28 records that did not meet the inclusion criteria. Thus, 43 records were selected for full-text reading. Out of these, 5 records were removed because they were unavailable in full.

After evaluation of the full texts, 1 study was excluded for not meeting the inclusion criteria, resulting in a total of 37 studies included in the SLR. Figure 1 presents the detailed flow diagram of the study selection process.

The 37 studies analyzed in this SLR present a diversity of methodologies and approaches. Table 1 summarizes these findings, organizing the articles to facilitate comparative analysis. The studies are presented according to the assessment of the risk of bias (low or moderate), followed by information on the author and year of publication, methodology used, and soft skills observed. This categorization allows for a clearer and more accessible reading of the analyzed methods, highlighting their contributions to the research.

Table 1. Summary of Studies Included by Risk of Bias.

Bias	Author/Year	Soft Skills Observed	Approaches
Low	Cai (2022)	Teamwork, Communication, Creative Thinking, Motivation and Engagement	Escape Room vs. Online Class
Low	Castillo-Parra et al. (2022)	Sociability, Collaboration, Communication, Problem Solving	Systematic review
Low	Cuinas; Sanchez (2022)	Empathy, teamwork, leadership, resilience and social intelligence	RPG Games
Low	Forndran; Zacharias (2019)	Collaboration, Communication, Teamwork and Time Management	Methodology: PBL, Flipped Classroom and Gamification
Low	Garcia et al. (2020)	Motivation, Willingness to Learn, Competition, Problem Solving	Systematic Review
Low	Hellström et al. (2023)	Social interactions and subjective understanding of people.	Systematic Review
Low	Huang; Loid; Sung, (2024)	Communication, Team Building and Collaboration	Systematic Review
Low	Jaccard et al. (2022)	Communication, Teamwork and Stress Management.	Use of Serious Games by Teachers
Low	Marengo; Pagano; Soomro (2023)	Emotional Intelligence	Statistical Comparison of Performance in Serious Online Game vs. Analog Version
Low	Morrell; Eukel (2021)	Trust, Critical Thinking and Teamwork.	Nursing Students' Perceptions of Cardiovascular Escape Rooms
Low	Nalyvaiko et al. (2021)	Teamwork, critical thinking and creativity	Use of Digital Tools such as Classcraft
Low	Sheikh et al. (2023)	Entrepreneurial, Communication and ICT Skills	AnyLogic Business Simulation
Low	Tarpey (2022)	Critical Thinking, Leadership and Negotiation.	Simulator in Excel
Low	Toader et al. (2023)	Communication and Planning	Integration of Learning Games in Higher Education
Low	Viscione et al. (2019)	Problem Solving, Decision Making and Tactical Awareness	Teaching Games for Understanding (TGfU)
Low	Yanes et al. (2023)	Active learning and student engagement.	Impact of Serious Games on the Development of Social Skills and Employability
Low	ZabalaVargas et al. (2020)	Cognitive, emotional, affective and behavioral skills among students.	Systematic Review
Moderate	Almeida; Buzady (2022)	Emotional intelligence, communication, collaboration and conflict management	Evaluation of the Impact of the Serious Game FLIGBY on the Development of Social Skills
Moderate	Andreoni; Richard (2024)	Communication, Problem solving, Teamwork	Testing the Pedagogical Effects of the 2030 SDG Game

Source: authors, 2024

Table 1. Continued...

Bias	Author/Year	Soft Skills Observed	Approaches
Moderate	Andres (2021)	Emotional intelligence, Leadership, Independent decision making, Problem solving, Communication, Teamwork, Creativity, Attention to detail and Adaptability	Method: Quasi-Experimental Study Participants: 142 IT Students (3rd Year) Assessment: 28 Social Skills on a 4-Point Scale
Moderate	Borin et al. (2022)	Resilience, Teamwork, Creativity and Empathy	Use of the TORC Game on the Development of Social Skills in Risk Management
Moderate	Buzady; Almeida (2019)	Leadership, Teamwork, Emotional Intelligence and Problem Solving	Characterization of Students' Entrepreneurial Profiles and Experiences Structure: Three Phases with Semi-Structured Interviews
Moderate	Canhoto; Murphy (2016)	Teamwork, Communication and Problem Solving	Using Game Elements in Educational Experiences to Motivate Students and Make Learning More Interactive
Moderate	Cunha et al. (2023)	Autonomy, Engagement, Problem Solving, Stress Management, Teamwork and Communication	Escape Zoom - Cross-Sectional Descriptive and Exploratory Cohort Study with a Quantitative Approach
Moderate	Feroz et al. (2022)	Teamwork, Motivation, Negotiation, Collaboration and Effective Communication	Simulation Games to Create a Collaborative Learning Environment
Moderate	Fioravanti et al. (2022)	Communication and Negotiation	Using RPG Games as an Active Learning Strategy
Moderate	Grijalvo et al. (2022)	Strategic Capacity, Decision Making and Data Analysis	Evaluation of a Framework for the Use of Computer-Based Business Games in Higher Education
Moderate	Iriondo et al. (2019)	Teamwork and planning tasks effectively	Active Student Engagement in the Creation of Video Games as Learning Artifacts
Moderate	Lim (2024)	Teamwork and critical thinking	Neuroscience Themed Escape Room
Moderate	Mariano; Cordova (2022)	Communication, Teamwork and Problem Solving.	eSports Learning Modules (OLM)
Moderate	Martín-Hernández et al. (2021)	Teamwork, communication, problem solving and innovation behaviors	Evaluation of the Effects of Game-Based Learning (GBL) among University Students
Moderate	Morrell et al. (2020)	Trust, Critical Thinking and Teamwork.	Escape Room for Nursing Students
Moderate	Nopiyanto et al. (2023)	Verbal communication, teaching skills, leadership, teamwork, patience, self-potential, problem-solving, management, community needs, acceptance of differences, helping others, career understanding, course understanding, and academic development.	Integrating Service Learning into Traditional Sports Games Courses
Moderate	Rodríguez Iglesias et al. (2022)	Critical Thinking, Self-Criticism, Motivation, Engagement	Cooperative Learning integrated with a Gamification Strategy
Moderate	Skritsovali (2023)	Critical Thinking, Teamwork, Time Management and Problem Solving.	Analysis of the impact of gamification on learning, with 10 open-ended questions applied over three academic years, comparing experiences before and after the pandemic
Moderate	Tomczyk et al. (2022)	Teamwork (not developed by a third of students)	Investigating teachers' perspectives on elements of emergency e-learning during the COVID-19 pandemic
Moderate	Viviers et al. (2016)	Problem Solving, Decision Making and Tactical Awareness	Teaching based on the Teaching Games for Understanding (TGFu) approach

Source: authors, 2024

To ensure the rigor of the analysis, the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Qualitative Research was employed, covering criteria such as methodological appropriateness, transparency, and relevance. The appraisal considered the following aspects: study congruity, clarity of participant inclusion criteria, adequacy of data collection and analysis, interpretation of results, and relevance of the conclusions. Each criterion was rated as 'yes,' 'no,' 'unclear,' or 'not applicable.' Studies that met most of the criteria clearly were classified as having a low risk of bias, while those with methodological gaps were classified as having a moderate or high risk. For example, a study was considered low risk because it presented a detailed description of the methodology, justifying the choice of participants and demonstrating coherence between the theoretical approach and the results found.

Following, we present a detailed analysis of the risk of bias for each reviewed study.

Twenty-one studies identified different gamified methodologies, including simulations, role-playing games (RPGs), escape rooms, serious games and specific digital games, such as FLIGBY, TORC and the 2030 SDG Game. These methods have proven effective in developing essential soft skills for the 21st century.

Two articles demonstrated that the use of FLIGBY is particularly efficient in developing skills such as leadership, conflict management, diplomacy and emotional intelligence (Almeida; Buzady, 2022; Buzady; Almeida, 2019).

Similarly, one study found significant improvements in communication, teamwork, creativity, critical thinking, and problem-solving after participating in the 2030 SDG Game (Andreoni; Richard, 2024).

Another study found that the game TORC increased participants' creativity, empathy, and resilience, skills crucial for project management (Borin; Martins Corrêa Rodrigues; Wachs, 2022).

Four papers indicate that digital escape room activities improve teamwork, time management, communication, innovation and critical thinking (Cai, 2022; Lim, 2024; Morrell; Eukel, 2021; Morrell; Eukel; Santurri, 2020).

Two studies highlighted the effectiveness of RPG simulations in developing a variety of soft skills, including communication and negotiation (Fioravanti et al., 2022; Jaccard; Bonnier; Hellström, 2022).

Serious games have been highlighted by 3 studies as powerful tools for strengthening students' critical thinking, teamwork and intrinsic motivation (Hellström; Jaccard; Bonnier, 2023; Martín-Hernández et al., 2021; Yanes et al., 2023).

Eight studies have shown that gamification has promoted interpersonal skills, analytical skills, responsibility, communication, empathy, planning and critical thinking (Grijalvo; Segura; Núñez, 2022; Nalyvaiko et al., 2021; Rodríguez-Iglesias; Moreno-Adalid; Gallego Trijueque, 2022; Sheikh; Abdalkrim; Shehawy, 2023; Skritsovali, 2023; Tarpey, 2022; Viscione; Invernizzi; Raiola, 2019; Zabala-Vargas et al., 2020).

The integration of physical activities and practical experiences into the curriculum was also addressed by five studies. Two studies highlighted the relevance of employability skills, such as communication, which can be enhanced through practical learning (Canhoto; Murphy, 2016; Castillo-Parra et al., 2022).

Two studies highlighted different gamified approaches to foster collaboration and develop soft skills in educational settings. The first study investigated *Escape Zoom®*, a digital adaptation of the *Escape Room* concept, applied to nursing education. The strategy involved interactive challenges on a virtual environment, promoting collaborative learning, engagement and team decision-making (Cunha et al., 2023). The second study explored the model *Teaching Games for Understanding (TGfU)*, a pedagogical method used in physical education that emphasizes the tactical understanding of games as a tool to develop cognitive and social skills, such as communication and problem-solving (Viscione; Invernizzi; Raiola, 2019).

One article emphasized the importance of physical activities for developing emotional intelligence, problem solving, and teamwork, particularly among Information Technology (IT) professionals (Andres, 2021).

Four articles discuss gamification in relation to pedagogical approaches. Two studies demonstrated that business simulations and other pedagogical approaches encourage the application of theoretical knowledge and improve decision-making, increasing academic performance and engagement (Feroz et al., 2022; Sheikh; Abdalkrim; Shehawy, 2023). One article highlighted that teachers who embrace e-learning are able to more effectively promote collaboration and other social skills among their students (Tomczyk et al., 2022). Another study observed significant improvements in students' knowledge and critical-thinking skills after experiences in educational escape rooms (Morrell; Eukel, 2021)

Integrating soft skills into technical courses has been found to be an effective strategy in two studies. One study highlights the importance of incorporating soft skills into engineering programs due to the growing demands of the labor market (Cuinas; Sanchez, 2022). Another study confirms that digital games promote interpersonal skills, decision making, communication, teamwork, analytical skills, and responsibility (Garcia et al., 2020).

In the context of holistic development, two papers showed that holistic and gamified approaches enhance soft skills and techniques, including planning, self-criticism, and intuitive behavior in physical activities (Iriondo et al., 2019; Viscione; Invernizzi; Raiola, 2019). Another study found that service-learning significantly improved pre-service teachers' soft skills by integrating theory and community practice (Nopiyanto et al., 2023).

Comparisons were also considered in four studies. One study found that Polish students performed better in soft skills compared to Romanian students, highlighting the importance of cultural differences (Toader et al., 2023). Finally, three studies highlighted the effectiveness of gamification in improving diverse soft skills, demonstrating that gamified methodologies are more engaging than traditional lessons, promoting both soft skills and academic knowledge (Andreoni; Richard, 2024; Borin; Martins Corrêa Rodrigues; Wachs, 2022; Forndran; Zacharias, 2019).

Table 2 presents a summary of these results.

Table 2. Summary of results.

Category	Category
Serious Games and Simulations	Jaccard et al. (2022), Marengo et al. (2023), Sheikh et al. (2023), Tarpey (2022), Yanes et al. (2023), Almeida; Buzady (2022), Andreoni; Richard (2024), Borin et al. (2022), Feroz et al. (2022).
Game-Based Learning	Forndran; Zacharias (2019), Toader et al. (2023), Canhoto; Murphy (2016), Grijalvo et al. (2022), Iriondo et al. (2019), Rodríguez Iglesias et al. (2022),
Escape Rooms and RPG Games	Cai (2022), Cuinas; Sanchez (2022), Morrell; Eukel (2021), Cunha et al., (2023), Fioravanti et al. (2022), Lim (2024), Morrell et al. (2020).
Systematic Reviews	Castillo Parra et al. (2022), Garcia et al. (2020), Hellström et al. (2023), Huang et al. (2024), Zabala Vargas et al. (2020).
Digital Tools	Nalyvaiko et al. (2021), Viscione et al. (2019), Andres (2021), Buzady; Almeida (2019); Mariano; Cordova (2022), Martín-Hernández et al. (2021), Nopiyanto et al. (2023), Skritsovali (2023), Tomczyk et al. (2022), Viviers et al. (2016).

Source: authors, 2024.

The analysis of the studies reveals that gamification has been widely used in higher education for the development of soft skills, such as communication, leadership, problem solving and teamwork.

Gamification and game-based learning emerge as effective strategies to engage students and stimulate active learning, promoting greater knowledge retention and involvement in academic activities.

Serious games and simulations stand out as complementary tools to gamification, allowing students to develop social-emotional and cognitive skills in a safe and experimental

environment. These approaches are particularly relevant for courses that require decision making, collaborative work and critical thinking.

Escape Rooms and RPGs represent immersive methodologies that encourage team problem solving, strategic planning and creativity. These playful experiences encourage challenge-based learning and the development of emotional intelligence.

The analyzed systematic reviews reinforce the growing relevance of gamification as an educational strategy, consolidating evidence on its effectiveness in the development of soft skills in higher education.

Studies using digital tools indicate that technology can enhance learning, making the educational environment more dynamic and interactive.

Finally, cooperative and project-based learning demonstrates that gamification, when combined with active methodologies, can promote more meaningful and applied learning. The set of studies suggests that the choice of gamified approach should consider the pedagogical context and the desired skills in order to maximize the impact on student education.

The assessment of potential bias across studies was conducted considering factors such as sample size, intervention techniques and data interpretation. Although many studies demonstrated a robust methodological framework, some lacked adequate control groups or detailed statistical analyses.

The research reviewed did not provide adequate information to facilitate a formal meta-analysis. However, a consistently positive trend in results was observed, which is translated into notable improvements in social skills among participants across all studies. The considerable heterogeneity across studies resulted from variations in methodologies and intervention settings.

The heterogeneity observed across studies can be attributed to several factors, including discrepancies in intervention strategies (e.g., types of serious games, role-playing scenarios, digital escape rooms), diversities in the demographics under study (e.g., students from various academic courses, educators in training), and the overarching educational settings (e.g., formal academic settings versus professional development contexts).

DISCUSSION

The results of this SLR indicate that several gamified methodologies, including serious games, specific digital games, and gamified practical activities, are effective in developing essential soft skills for the 21st century. These findings corroborate previous studies that have also highlighted the potential of gamification in education and professional training (Deterding et al., 2011a; Hamari; Koivisto; Sarsa, 2014). The effectiveness of games such as FLIGBY in developing skills such as leadership and emotional intelligence, for example, reflects the conclusions by Almeida and Buzady (2022), and Buzady and Almeida (2019), who identified the same potential in their studies.

Similarly, improvements in communication, teamwork and critical thinking observed in the 2030 SDG Game (Andreoni; Richard, 2024) and the escape digital rooms (Cai, 2022; Lim, 2024) are consistent with the literature exploring the application of interactive and collaborative learning environments (Connolly et al., 2012; Gee, 2003). Furthermore, the use of serious games to strengthen students' critical thinking, teamwork and intrinsic motivation (Hellström; Jaccard; Bonnier, 2023; Martín-Hernández et al., 2021; Yanes et al., 2023) confirms the effectiveness of these tools in promoting deep and meaningful learning, as indicated by De Freitas and Oliver (2006) and Hays (2005) (Freitas; Oliver, 2006; Hays, 2005).

Role-playing simulations, which have been shown to be effective in developing skills such as communication and negotiation (Fioravanti et al., 2022; Jaccard; Bonnier; Hellström, 2022), are supported by studies that analyze the impact of simulations and role-playing in education. According to Garris, Ahlers, and Driskell (2002), these simulations promote an active learning environment, fundamental to the acquisition of interpersonal skills (Garris; Ahlers; Driskell, 2002). TORC games and other gamification activities that increased participants' creativity, empathy, and resilience (Borin; Martins Corrêa Rodrigues; Wachs, 2022) reinforce Schell's

(2008) conclusions about the ability games have to foster essential emotional and social skills (Schell, 2008).

The inclusion of gamified physical activities, which have been shown to improve skills such as emotional intelligence, problem solving, and teamwork (Andres, 2021; Canhoto; Murphy, 2016; Castillo-Parra et al., 2022), is in line with research that emphasizes the connection between physical activities and the development of soft and emotional skills. Studies by Blakely et al. (2009) and Lieberman (2006) indicate that physical activities combined with gaming elements can be a powerful tool for experiential learning and the development of soft skills (Blakely et al., 2009; Lieberman, 2006).

Pedagogical approaches that use business simulations and e-learning to improve the application of theoretical knowledge, decision making, and academic performance (Feroz et al., 2022; Sheikh; Abdalkrim; Shehawy, 2023; Tomczyk et al., 2022) reflect the effectiveness of active learning methods described by Prince (2004). These methods encourage student engagement and practical application of learned concepts, fostering deeper understanding and applicable skills (Prince, 2004).

Finally, international comparisons that highlighted cultural differences in the development of soft skills (Toader et al., 2023) emphasize the importance of cultural context in the effectiveness of gamified methodologies. Studies such as those by Hofstede (1980) and Trompenaars (1993) emphasize that culture can significantly influence the way educational methods are received and implemented (Hofstede, 1980; Trompenaars, 1993).

In summary, the findings of this SLR not only confirm but also expand the body of evidence on the effectiveness of gamified methodologies in developing soft skills. This body of evidence reinforces the relevance of gamification as a powerful and versatile educational strategy to address current educational challenges.

Although the reviewed studies demonstrate positive results, several limitations should be considered. First, most of the research focuses on controlled settings and may not accurately reflect the complexity of real-world applications. In addition, many studies have limited sample sizes and diversity, which may affect the generalization of the results. For instance, the studies that investigated FLIGBY (Almeida; Buzady, 2022; Buzady; Almeida, 2019) used samples predominantly composed of business students, which may not represent other educational or professional contexts. There is also a lack of longitudinal studies that can assess the long-term effects of these methodologies.

This SLR also has methodological limitations. The selection of studies was based on specific criteria that may have excluded relevant unpublished research or research published in languages other than English, Spanish, or Portuguese. Furthermore, the heterogeneity in the methodological approaches of the included studies prevents direct comparison and synthesis of the results. For instance, different metrics and soft skills assessment instruments were used, which may introduce bias and inconsistencies in the findings. The SLR failed to deeply address the methodological quality of each included study, which is important to assess the robustness of the evidence presented.

The results of this SLR have important implications for educational and professional training practice, as well as for policy formulation and future research. In practical terms, educators and trainers can consider incorporating gamified methodologies into their curricula to promote the development of essential soft skills. Educational policies can be adapted to encourage the use of digital games and other gamified tools, especially in areas that require interpersonal and problem-solving skills.

For future research, it is essential to conduct longitudinal studies to assess the long-term impacts of these methodologies, and to expand the diversity of samples to include diverse cultural and professional contexts. Furthermore, it would be beneficial to develop and standardize soft skills assessment metrics to facilitate comparison and synthesis of results in future systematic reviews. Finally, further research should explore the integration of gamified methodologies with other innovative pedagogical approaches to maximize the potential for developing soft and academic skills.

CONCLUSION

This SLR has demonstrated that gamification, including serious games and simulations, is a highly effective methodology for developing soft skills in higher education. Soft skills developed through these methodologies include communication, leadership, critical thinking, problem solving and teamwork, all of which are essential to meet the demands of the contemporary labor market.

The main objective of the research was to investigate the impact of gamification on the development of soft skills among higher education students. The findings confirm that gamified methodologies promote the development of these skills and significantly increase student engagement and motivation. This increase in engagement is relevant, since intrinsic motivation is a determining factor for learning effectiveness.

The research questions were aimed at understanding which soft skills can be developed through gamification and how these methodologies influence student motivation. The SLR indicated that a wide range of skills can be effectively developed, and that the application of different types of games and simulations, from physical activities to digital escape rooms, can be adapted according to the educational context and specific learning objectives.

The literature shows that gamification is an effective methodology for developing soft skills, such as communication, leadership, critical thinking, problem solving and teamwork. Although gamification is based on the application of gaming elements in non-playful contexts, studies indicate that its effectiveness can be increased with the strategic use of serious games and simulations as complementary resources. This methodological convergence strengthens participant engagement and enhances active learning, making the educational process more dynamic and immersive.

Incorporating soft skills alongside technical skills is essential to prepare students for the demands of the modern labor market. The diversity of methods, from physical activities to digital escape rooms, demonstrates that diverse approaches can be effective depending on the educational context and specific learning objectives, highlighting the need for an integrated and holistic approach in contemporary education.

Despite the positive findings, some limitations should be considered. First, the methodological diversity among the reviewed studies poses a challenge for comparing the results. Different studies adopted different approaches, such as digital games, escape rooms and simulations, using different assessment instruments to measure the developed soft skills. This heterogeneity prevents quantitative synthesis and the extraction of general conclusions.

Another relevant limitation concerns the bias and generalization of the findings. Most of the analyzed studies were conducted in controlled academic environments, which may not fully reflect the dynamics of higher education in real-world settings, where institutional, cultural, and socioeconomic factors play an important role. Furthermore, few studies adopted a longitudinal approach, which limits the understanding of the persistence of gamification benefits in the development of social skills over time.

The influence of cultural and contextual factors also deserves attention. Although some studies have highlighted differences in the effectiveness of gamified strategies in different educational contexts, most of the reviewed investigations did not deeply investigate how cultural aspects can impact gamified learning. This suggests the need for comparative studies across different countries and institutions to assess how cultural variables influence outcomes.

Given these limitations, future research should focus on longitudinal studies that assess the sustained impact of gamification on the development of soft skills. Furthermore, standardizing metrics to measure soft skills could contribute to better comparisons between different interventions. It would also be beneficial to explore the integration of gamification with other innovative pedagogical approaches in order to maximize students' learning and development potential.

The findings of this review have important implications for educational practice and professional training, suggesting that educators and policymakers should consider incorporating gamified methodologies into their curricula. Gamification, when well implemented, has the potential

to transform higher education by making learning more dynamic, interactive and effective for developing essential skills in the modern workforce.

However, its application requires careful planning, as factors such as gamification design, participant engagement, and adaptation to the educational context can significantly influence its results. Moreover, challenges such as teacher and student resistance, the need for teacher training, and the lack of standardized metrics to assess its effectiveness must be considered. Thus, future research should deepen the understanding of the conditions necessary for gamification to fulfill its role effectively and sustainably in higher education.

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Authors contribution

APSD, LRZDCD: Conception and formulation of study objectives. APSD: Development of the study methodology. ALC, CFBJ: Validation of the methods. PP, CFBJ: Formal analysis of the data. APSD, LRZDCD: Data collection. APSD, ALC: Writing of the original draft. CFBJ: Review and editing of the manuscript.

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