REVIEW ARTICLE

A Systematic Review of Gamification as a Playful Strategy to Prevent Bullying

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Abstract: Playful learning is an educational method in which students experience fun and curiosity in an active context that is meaningful to them. Game-based learning, serious games, and gamification can be highlighted here. The purpose of this study is to conduct a systematic review of studies that have used gamified resources as a game-based strategy for bullying prevention. For this study, a search of several databases (Scopus, PubMed, Web of Science, and Dialnet) was conducted. 606 studies were collected, of which 12 scientific studies were selected. Playful strategies are effective in identifying and processing different variables related to bullying. The use of playful strategies in the classroom has many benefits and several studies confirm that it is an effective method for raising awareness and preventing bullying.

***Keywords*:** Systematic review; Gamification; Serious game; Bullying; Prevention

1. Introduction

Over time, in the field of education, more and more new teaching methods are being developed, adapting to new generations, to meet the needs of students and the changes that society brings. Playful resources can be highlighted, among which are Game-Based Learning (GBL), video games, serious games and gamification. Playful learning is an educational method in which students experience fun and curiosity in a context that is active and meaningful to them[1]. GBL consists of using a game to enhance learning[2], or using the game as part of the learning process[3], for all levels of education[4]. It is a learning paradigm that engages students and stimulates active learning (e.g., problem solving and learning by doing) through a game-like environment[5] and uses video games and related elements of reality, content, theme, and images of the game in the educational process[6]. GBL

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facilitates children to work on executive functions[7].

Serious game (SG) refers to the idea of using games for purposes beyond entertainment. They are educational tools that have been shown to be effective, highly motivating, and able to raise awareness, impart knowledge, and improve skills[10–12]. SG has a link between emotional intelligence skills and student performance outcomes in serious games[13]. With SG, mistakes become an element of learning where students acquire challenging skills and therefore failures are more easily tolerated in a game context[14] to raise awareness of situations that require change and where action must be taken to achieve it[15]. To achieve this, it is developed considering the needs of a specific group[16].

Gamification is based on the use of game design elements in environments that are not playful to create a more entertaining, motivating, and attractive service or product[17–20]. It is based on three elements of the game: the dynamics, the mechanics, and the components of the game; the interaction of these three elements makes the activity gamified:

- The dynamics: is the concept and the implicit structure of the game.
- The mechanics: are the processes that cause the development of the game.
- The components: are the specific implementations of the dynamics and mechanics: avatars, badges, points, collections, leader boards, levels, and teams, among others.

The use of game elements in educational dynamics favors skills and positive attitudes towards meaningful learning[22]. Apart from the use of game elements, gamification in learning includes educational context, learning outcomes, learner profile, and gamified environment[23]. Gamification is the mixture of game mechanics and media: voluntary participation, approaching reality through an imaginary world with rules, and increasing intrinsic motivation[24].

According to Hamari and Koivisto[25], the difference between gamification and video games is that the former aims to influence people's behavior and to generate and create experiences and feelings of mastery and autonomy, while video games create hedonistic experiences through audiovisual means. Similarly, Ardila-Muñoz[26] states that video games only have the main objective of attracting users/players and providing them with fun without making the experience monotonous or complex. However, several benefits are achieved with gamification, including: better control and monitoring of actions performed by students; assessment activities lose their punitive nature; the teaching-learning relationship is characterized by competition and cooperation and promotes problem-based learning and discovery learning.

A less-studied aspect of the opportunities offered by gamification strategies is their ability to foster collaboration and social skills that are critical to school coexistence. Gamification is based on behavioral theories applied as techniques to change behavior in a specific direction, and its results are measurable[27]. Likewise, there are many SGs that address different social issues to promote social change[28]. Nowadays, there is a real social interest in coexistence problems in education. School coexistence is a concern of the educational and scientific community because of the need for education based on the values of coexistence and preventive education on antisocial behavior[29]. Bullying is a holistic situation that involves the family, school and society, and its problem has an impact on socioemotional and physical development[30].

Bullying refers to a series of aggressive behaviors (repeated physical, psychosocial, or verbal aggression) of some students who are in a position of power over weaker ones, with the intention of causing them pain for their satisfaction. Abuse of power and the desire to intimidate and dominate are the main reasons why bullies act this way[31]. Bullying has a serious impact on the socialization process of students and especially on the development of their personality[32].

1.1. Related work

This section presents some of the relevant literature reviews on playful strategies. Numerous studies have examined bullying and gambling strategies, but we have not found any study that focuses on both topics and links them together. The most researched aspects of gamification are the improvement of motivation and the positive effects on academic performance.

The study most like ours is by Calvo-Morata[33], although it focuses exclusively on serious games. For this reason, we consider this systematic review important because it allows us to have a global overview of the scientific literature on playful strategies and specifically on bullying. Calvo-Morata[33] conducted a systematic review of serious games to prevent and stop bullying and cyberbullying. The main objectives of this research were: the benefits of using video games, the game mechanics and types of games used, the types of studies, and the number of users participating in the game. The results show a variety of video games that use different strategies to deal with (cyber)bullying. Nevertheless, it is confirmed that serious games can be used effectively to raise awareness, generate empathy, and teach new strategies to address both bullying and cyberbullying.

Prieto-Andreu[34] collected information, summarized, and integrated all studies on the impact of gamification on student motivation and learning. For this purpose, a search was conducted in 4 databases on study design, participants, variables, instruments, and outcomes. 22 studies were included. The results of this study show that gamification in higher education motivates students and improves their learning by providing opportunities to develop engagement skills. It was concluded that points, badges, and learning boards are a good combination of mechanisms to apply gamification in teaching. Navarro-Mateos *et al.*[35] aimed to determine the impact of gamification in Spanish education, in order to identify at which stages and in which subject's gamification is used. For this reason, a search was conducted in 3 databases. 15 articles were included, in which it was shown that gamification is used more frequently in the college environment and less in high school. In general, they agree that gamification influences students' motivation, although no conclusions can be drawn due to inconsistencies in the sample size, application interval, methodology developed, variables to be influenced, and measurement instruments in the studies analyzed. Manzano-León *et al.*[36] examined the existing evidence on the effects of gamification on students' motivation and academic performance, considering the temporal distribution, educational level, variables, and the most frequently used game. For this purpose, a search was conducted in 3 databases. 14 studies were included in which gamification showed a positive impact on students' academic performance, engagement, and motivation.

Prieto-Andreu *et al.*[37] analyzed the relationship between gamification, motivation, and learning, providing pedagogical and didactic suggestions for its use in non-college education. A search of 2 databases was conducted. Thirty-seven studies were included in this systematic review showing that gamification has a positive impact on students' experiences of motivation and achievement. Min *et al.*[38] investigated the effectiveness of serious games in student education to provide recommendations and implementation strategies and suggest future directions for the development and application of serious games. A search of 6 databases and a hand search of reference lists of selected studies or review articles found only 7 of 615 studies. The use of serious games was found to improve students' knowledge and achievement.

Boyle *et al.*[39] focused on the potential impact and positive outcomes of serious gaming in terms of learning, skill improvement, and engagement. A search of 6 databases was conducted. 143 articles were included where the most common outcomes were knowledge acquisition, affect, behavior change, perception, cognition, and physiology. Games for learning various topics were found, with health being one of the most popular topics. Nocentini *et al.*[40] studied information and communication technologies interventions against bullying (serious

games and online platforms) and analyzed programs and evidence of their effectiveness. A search was conducted in 3 databases, and 32 of the 840 articles were considered. It was found that digital tools are generally underused in anti-bullying and cyberbullying prevention and intervention (13 programs were found in the search). It is concluded that there is a continued need to research their effectiveness.

The meta-analysis of Kim and Catelli[41] aimed to quantify the impact of gamified interventions on behavior change. To do so, a search of several databases was conducted (The Academic Search Complete, Communication & Mass Media Complete, Education Fuente, ERIC, Library Information Science & Technology Abstracts, and PsycINFO). It was found that the effects of gamification were greater in higher education than in K-12 students (preschool or elementary school), that interventions lasting less than one week were significantly more effective than those lasting up to 20 weeks, and that interventions that included elements of gamification over several years were negatively associated with behavior change. However, it was concluded that short-term gamification interventions may be a promising way to initiate changes in students' behavior and improve learning outcomes.

1.2. Objective and research questions

The purpose of this research is to provide a systematic review of studies that have used gamified resources as a playful strategy to prevent bullying. The novelty of this study is that it examines the use of different playful strategies (gamification, serious games, and games) in the current literature. In terms of research questions, the following are posed:

- How are the playful resources of the selected studies classified?
- What gamification elements were used in the studies reviewed?
- What are the benefits of gamified resources in a classroom setting in relation to bullying?

2. Methodology

A systematic review was performed, following the pre-established recommendations for systematic reviews and meta-analyses of the PRISMA statement[42]. The aim of this systematic review was to collect all the available evidence according to the eligibility criteria. Several databases were used to collect the studies analyzed in the systematic review: PubMed, Scopus, Web of Science and Dialnet. The search in the databases was performed between November 2022 and January 2023 where all the studies published in the last ten years (2013–2023) were collected, considering the thematic of this systematic review.

Regarding the descriptors, both Spanish and English terms have been used: Bullying, gamifi*, game and GBL. The Boolean operators AND and OR were used to relate these descriptors. The search string used was: (bullying) AND ("gamifi*" OR "game" OR "GBL").

First, a search for information on the subject was carried out in the different databases. The choice of articles will depend on the objectives that have been previously set. For this purpose, the descriptors mentioned above will be used to obtain information of interest. Secondly, a series of criteria will be considered for the exclusion or inclusion of the information found. 12 of 606 studies have been selected because they meet the inclusion criteria and are consistent with the main objective of this study. The inclusion criteria for this systematic review are specified below:

- Language: articles in English and Spanish will be included. Articles whose full text is not in these languages are excluded.
- Type of document: only scientific articles published in peer-reviewed journals are included. Other documents such as book chapters, doctoral theses and conference or congress papers are excluded.

- Type of intervention: playful intervention studies are included, therefore theoretical, descriptive or review articles are excluded.

Finally, all the results were exported to the Rayyan online software. This platform automatically identifies duplicate documents and facilitates the systematization of the review process. The flowchart in **Figure 1** shows the method used for article selection.

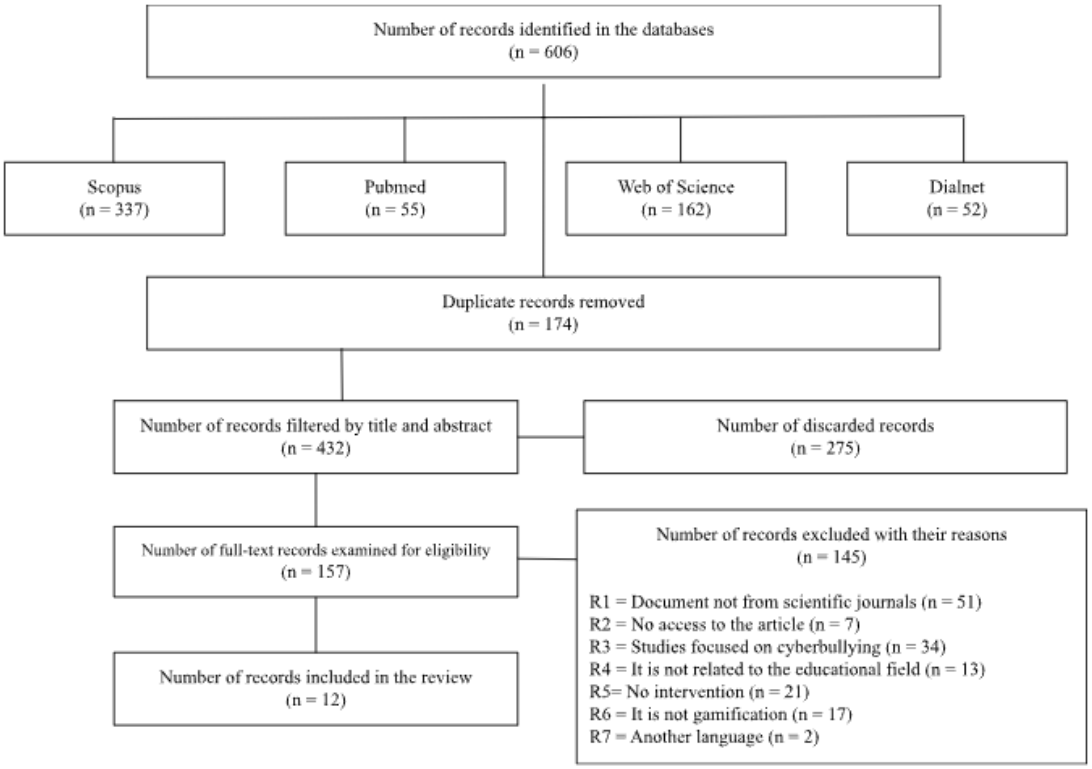

Figure 1. Flowchart of the systematic review.

3. Results

The selected studies on the prevention of bullying through playful resources will be presented in **Table 1** after the search in the different databases.

In answering the first research question, **Figure 2** shows that most studies, 8 out of 12, used serious games or video games as a leisure activity, representing 66.7% of the studies analyzed, with 16.7% using games to prevent bullying, in two studies, a cooperative board game and an interactive game through an application. Regarding the programs, the two selected studies (16.7%) used the same program, called the KiVa anti-bullying program.

As for the use of mechanisms, they were mostly used to represent harassment situations through an adventure or story. In most games, the situations are represented by mini-games or videos, or they are divided into parts until the challenges or tasks are completed to earn points or to advance in the stages or levels of the game. The mechanisms used in the different games are points, rewards, levels, QR code (Prever Game), and personalization (creation of the game's avatar). As for dynamics, challenges, roles, tasks, lessons, dialogues and messages are used. Finally, the use of narratives in these games should be highlighted, as well as the creation of everyday scenes with a victim, an attacker and a spectator. The most common graphics used in the games were 2D, 3D, and augmented reality.

Table 1. Results

No.	Qualification, author, year	Objective	Sample	Design, duration	Results
1	Technological resources to prevent cyberbullying during adolescence: the Cyberprogram 2.0 program and the cooperative Cybereduca 2.0 Videogame. (Garaigordobil & Martínez-Valderrey, 2018)[43]	Prevent and reduce bullying and cyberbullying during adolescence.	176 adolescents. Age: between 13–15 years.	Quasi-experimental with repeated measures pretest-posttest and control groups. Weekly sessions of 1h throughout the school year.	Bullying behaviors decreased, and positive social behaviors increased.
2	Evaluation of the Emotional Education program "Happy 8-12" for the assertive resolution of conflicts among peers. (Filella *et al.*, 2016)[44]	Train the emotional management of boys and girls; the program is focused on the assertive resolution of conflicts.	574 students. Age: 10–12 years.	Quasi-experimental pretest and posttest with a control group. 1 academic year.	Educating the management of emotions improves the well-being of students and acts as a prevention of bullying, among others.
3	Creating awareness on bullying and cyberbullying among young people: validating the effectiveness and design of the serious game Conectado. (Calvo-Morata *et al.*, 2021)[45]	Describe and verify the effectiveness of a serious game to prevent bullying.	1,004 participants. Age: between 12 and 17 years old.	Quizzes and player interactions within the game. Formative evaluation: 50–60 min. Control group: 1:30 h session	A positive effect on bullying awareness was demonstrated in participants aged 12–15 more than in those aged 16–17.
4	The role of experience during playing bullying prevention serious game: effects on knowledge and compassion. (Rončević Zubković *et al.*, 2022)[46]	Explore the experience of a serious game aimed at bullying prevention and its effects on knowledge and compassion.	Students from 10 schools, 36 from each of them. Age: between 12 and 14 years.	Online survey before and after the game session. 4–6 hours, each session of 30 min. Two sessions a week.	Positive effects on post-game outcome in terms of prior knowledge and compassion were demonstrated. No mediation effects were found using the gaming experience variables.
5	Improving children's mental health with a digital social skills development game: a randomized controlled efficacy trial of adventures aboard the S.S. GRIN. (Sánchez *et al.*, 2017)[47]	Investigate whether a game influences the improvement of social skills and mental health.	69 students. Age: 7–11 years.	Survey before and after playing the serious game. 1 episode weekly for 9 weeks.	Children who participated in the game significantly improved in social literacy, social anxiety, and bullying victimization.

Table 1. (*Continued*)

No.	Qualification, author, year	Objective	Sample	Design, duration	Results
6	Effects of a collaborative board game on bullying intervention: a group-randomized controlled trial. (Nieh & Wu, 2018)[48]	To examine the effects of the Galaxy Rescuers game on bullying intervention.	328 students. Age: 11–12 years.	Experimental design of randomized groups. 7 weeks, 1 class session each week (40 minutes plus 10 breaks).	The play only group and the report play group demonstrated a change in knowledge about bullying. The game group with debriefing showed an increase in empathy and a decrease in bullying.
7	System to detect racial-based bullying through gamification: a serious game-based solution to prevent bullying. (Álvarez-Bermejo *et al.*, 2016)[49]	Prevent and detect bullying due to racial stigma in school contexts using a system designed following "gamification" principles.	151 students. Age: between 7 and 12 years.	Ad hoc questionnaire with items.	It was shown that discrimination outside the classroom due to racial stigma does not seem to be present in sport as it is in the classroom.
8	Evaluación de Happy Sport, un programa de educación emocional para la resolución asertiva de conflictos en el deporte. (Ros-Morente *et al.*, 2022)[50]	Analyze the effectiveness of the Happy Sport gamified program.	194 athletes. Age: between 8 and 12 years.	Quasi-experimental pre-intervention and post-intervention with a control group.	The levels of bullying decreased, and the satisfaction of the children increased.
9	Evaluation of serious game for changing students' behaviour in bullying situation. (Kolić-Vehovec *et al.*, 2020)[51]	Check the effectiveness of a serious game to improve the help behavior of spectators in bullying situations.	355 students. Age: between 12 and 14 years.	An experimental group (Empathy School game) and two control groups. One of the groups played another game, and those in the other group did not play any game. 6 hours for 6 weeks.	Most of the participants chose the helping behavior in bullying situations.
10	Effectiveness of the KiVa antibullying programme on bully-victims, bullies and victims. (Yang & Salmivalli, 2015)[52]	To investigate the effectiveness of the KiVa anti-bullying program in reducing the prevalence of bully-victims.	23,520 participants. Age: between 8 and 15 years.	Quasi-experimental pretest and posttest with control groups. 1 school year (9 months).	KiVa is effective in reducing the prevalence of bully-victims.

Table 1. (*Continued*)

No.	Qualification, author, year	Objective	Sample	Design, duration	Results
11	A serious game-based solution to prevent bullying. (Raminhos *et al.*, 2016)[53]	Induce changes in attitude to prevent bullying.	27 students. Age: between 9 and 14 years.	Questionnaire. 2 weekly sessions of 45 min for 1 month.	The game has good potential in preventing bullying.
12	Effectiveness of the KiVa antibullying program with and without the online game in Chile: a three-arm cluster randomized controlled trial. (Valenzuela *et al.*, 2022)[54]	To evaluate the effectiveness of the KiVa anti-bullying program.	5,923 participants (baseline survey); 3,968 participants (final survey).	Three-arm cluster RCT study: full KiVa group, partial KiVa group, control group.	The partial KiVa group had a lower percentage of bullying at the final survey compared to the control group. There was no effect of the entire KiVa group compared to the other groups.

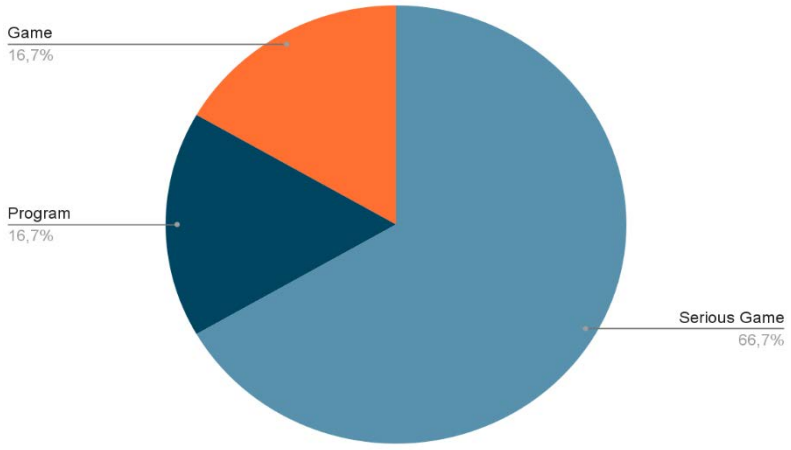

Figure 2. Classification of the studies according to the resource used.

As for the third question, what are the benefits of gamified resources in the classroom in relation to bullying?

Numerous studies show that the use of gamification has been able to raise awareness, reduce and prevent behaviors that lead to bullying, as well as promote collaboration, increase motivation, improve social and emotional skills and emotional competencies, promote empathy and interaction between students, and support the use of digital literacy.

4. Discussion

In general, playful strategies such as game-based learning and serious games are steadily increasing. However, despite the growing interest in games as an awareness tool, more studies are needed to consolidate their use in the fight against bullying.

This study provides an overview of recent scientific articles that allow us to highlight the use of serious games and game-based learning to combat bullying. In general, the results of the study show that the use of these strategies has produced encouraging results in reducing bullying and promoting greater empathy and participation

among students.

The games typically focus on placing participants in a bullying situation where they experience the various roles that occur during conflict, with the roles of victim, aggressor, and bystander being the most common. The games are typically presented through storytelling[48] or consist of questions and answers about bullying centered around a fantasy story, a comic strip that guides the game[43], 2D graphic adventures[45], social situations at school in which players have to choose the most correct responses[45,51], and different conflicts in a sports context represented by a symbol on the minimap[50]. In the case of the study of Raminhos *et al.*[53], stalker profiling was avoided due to the risk that victims and bystanders might play the game as stalkers, with unknown consequences for the players.

The most used gamification elements in these studies were points, rewards, levels, game avatar creation, challenges, tasks, lessons, dialogs, and messages. In contrast, only some of the studies used or analyzed games with graphics: in the case of Calvo-Morata *et al.*[45], a 2D game was analyzed; Álvarez-Bermejo *et al.*[49] used augmented reality; and Raminhos *et al.*[53] used Unity 3D.

In this type of games, the participant reflects and decides how to engage properly and confidently[44,50]. In other cases, they work through lessons in which participants learn content about bullying[52,54].

The games are based on the work of skills, especially socio-emotional skills, such as communication, cooperation, empathy, conflict resolution[43], and compassion[46], reducing anxiety levels, improving the school environment at recess and in the classroom[44], and increasing social and emotional competencies[50,54]. Most importantly, however, empathy is fostered as players empathize and witness the victim's experiences during play[48,52,53].

One benefit of using game-based strategies is that it promotes collaboration, increases students' motivation and engagement, and improves social relationships among students. Likewise, interaction between peers is promoted[49].

5. Conclusions

In conclusion, this systematic review can contribute to understand and have a clearer idea of how play strategies are being researched to prevent bullying. The systematic review identified several benefits of the use of the strategies, proving to be an effective and highly motivating tool, able to raise awareness, teach knowledge, improve skills, and prevent bullying. The latter has been demonstrated more in serious games, i.e., most of the included articles have been effective in bullying prevention; however, no study has been found that employs only gamification to reduce bullying. In gamification, there are many studies investigating motivation and academic performance of students. Therefore, future studies could continue the use of this playful strategy for the prevention of bullying and the promotion of interpersonal skills.

Conflict of interest

No conflict of interest was reported by the authors.

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