




Article

Between Level Up and Game Over: A Systematic Literature Review of Gamification in Education

Ana Manzano-León ¹, Pablo Camacho-Lazarraga ², Miguel A. Guerrero ³, Laura Guerrero-Puerta ⁴, José M. Aguilar-Parra ^{1,*}, Rubén Trigueros ^{1,*} and Antonio Alias ⁵

¹ Hum-878 Research Team, Department of Psychology, Health Research Centre, University of Almería, 04120 Almería, Spain; aml570@ual.es

² Department of Education, Centro Universitario San Isidoro, 41092 Seville, Spain; pcamacho@centrosanisidoro.es

³ Department of Education, University of Seville, 41004 Seville, Spain; migupu97@gmail.com

⁴ Department of Education and Social Psychology, Pablo Olavide University, 41013 Seville, Spain; laura.guerrero.puerta@gmail.com

⁵ Department of Education, University of Almería, 04120 Almería, Spain; aag344@ual.es

* Correspondence: jmaguilar@ual.es (J.M.A.-P.); rtr088@ual.es (R.T.)

Abstract: Educational gamification consists of the use of game elements and game design techniques in the educational context. The objective of this study is to examine the existing evidence on the impact of educational gamification on student motivation and academic performance in the last five years in order to analyze its distribution over time, educational level, variables, and most used game elements, and know the advantages of its implementation in the classroom. For this, a systematic review is proposed through the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) methodology in three multidisciplinary databases, through an exhaustive search with inclusion and exclusion criteria on quantitative experimental studies that explore gamification in educational centers, which provide information about the most current lines of research. Fourteen studies were included in this review. These used experimental or quasi-experimental designs. Most of them report gamification as a valid learning strategy. The results support the conclusion that educational gamification has a potential impact on the academic performance, commitment, and motivation of students. Therefore, this study implies the need to expand research on the needs and challenges of students when learning with gamified techniques.

Keywords: gamification; systematic literature review; motivation; engagement; academic achievement



Citation: Manzano-León, A.; Camacho-Lazarraga, P.; Guerrero, M.A.; Guerrero-Puerta, L.; Aguilar-Parra, J.M.; Trigueros, R.; Alias, A. Between Level Up and Game Over: A Systematic Literature Review of Gamification in Education. *Sustainability* **2021**, *13*, 2247. <https://doi.org/10.3390/su13042247>

Academic Editor: Ahmed Tlili

Received: 11 December 2020

Accepted: 12 February 2021

Published: 19 February 2021

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1. Introduction

In recent years, gamification has received increased attention and interest in research and education [1]. It is currently present in our daily lives, although sometimes we do not even recognize it [2]. The scientific literature shows different definitions of the concept; the most used is the use of game design elements in nongame contexts [3]. During the last years, gamification has been installed in different disciplinary areas such as commerce [4], employment [5], health [6], environment [7], and, among others, our object of study, the educational area [8].

In education, gamification is a technique that proposes dynamics associated with game design in the educational environment, in order to stimulate and have direct interaction with students, allowing them to significantly develop their curricular, cognitive, and social competences. It is the use of techniques to engage people, motivate their action, and promote learning and problem solving [9]. This generates in the students a feeling of empowerment in their way of working to achieve tasks, making them more attractive and promoting cooperative work, effort, and other positive values typical of games [10].

1.1. Gamification Elements

Gamification is a process whose objective is to increase extrinsic and intrinsic motivation and get people involved in the task through ludic activities [11]. Intrinsic motivation is defined as the doing of an activity for its inherent satisfactions rather than for some separable consequence, while extrinsic motivation is incentivized with the acquisition of reinforcers [12]. When designing gamification strategies, it is important to find intrinsic motivations that keep users engaged. This concept is related to the Self-Determination Theory (SDT) [13], where there are three psychological needs: autonomy (the extent to which an action carried out by an individual comes from their own interests), competence (the feeling of ability and of executing a task to a certain level), and relatedness with others (the feeling of ability and of executing a task to a certain level) [14].

To elaborate a motivating gamification using SDT, it is required that players feel autonomy, in control of their own actions, and believe that they can achieve the tasks of the game [15]. In turn, to achieve this goal, gamifications should consider the types of players. Marczewski [16] formulated the RAMP model, an acronym for the four basic inducers of intrinsic motivation: relatedness, autonomy, mastery, and purpose.

Finally, gamifications that go beyond PBL (points, badges, leaderboards) follow systems of game design. The most studied is the MDE system (mechanics, dynamics, aesthetics) proposed by Hunicke, LeBlanc, and Zubek [17]. The MDE model is a methodology used in the video game design process, which establishes the relationship between rules–mechanics, game–dynamics system, and fun–aesthetics. Divide the gamification elements into:

- **Mechanics:** actions and control mechanisms offered to players within the context of a game. For example, draw cards, gamble, trade, attack, compete, cooperate.
- **Dynamics:** behaviors to be performed while the mechanics are being executed. For example, socializing, bluffing, reflection, status, attention.
- **Aesthetics:** desirable emotional responses evoked in players when interacting with the game system. It is divided into sensation, fantasy, narrative, challenge, companionship, discovery, expression, and entertainment.

1.2. Why Use Gamification to Improve School Motivation and Academic Performance?

Applying educational gamification promotes student participation in the classroom, especially if the game elements used in gamification have established objectives and rewards. For example, in the case of physical education, the study by Beemer, Ajibewa, and DellaVecchia [18] shows that 55% of the students who received gamification performed a minimum of 20 minutes of daily exercise to improve their health and only 15% did not participate regularly, with statistically significant differences compared to the traditional teaching group. This study also highlights that in low-income educational centers, it would be necessary to employ additional strategies and maximize the time of participation in breaks between activities to obtain better results. In students with lower motivation, gamification with immediate rewards (points and badges) with a narrative base can be very effective [19]. In university education, it is observed that when the subject is gamified, the participation and involvement of the students increase exponentially, and consequently their academic performance improves [20].

Therefore, when the school is gamified with the objectives of improving healthy habits, the physical environment improves as a playful school context is designed where students can be more active while having fun.

In scientific subjects, gamification has also been shown to have favorable results, relating its use to greater student engagement and learning [21,22]. This study argues that the reason for the results may be that students feel that they are an active protagonist in their learning progress and that the progression and practice of the game mechanics of the levels allow them to carry out a continuous practice of the academic curriculum; in addition, the dynamic of continuous feedback allows them to obtain clues and opportunities for reflection when it comes to problems. In the e-learning university context, after the application of

a gamified system with peer relations, blog, challenges, and medals, commitment and participation are provided [23]. The authors justify it due to a level of challenge that can be overcome by the students; this balance between the difficulty and their abilities allows motivation to be generated and the students to progressively advance during the course. However, when gamification systems use PBL (points, badges, leaderboards) or other gamification elements that only reinforce behaviors with prizes, appealing to extrinsic motivation, students may see their commitment to the course and learning reduced, and after a while of implementation, may be more demotivated with the gamified system [24].

Related to Science, Technology, Engineering, Art, and Math (STEAM) skills, educational gamification can be a valuable strategy for young students to learn to take care of the environment. One of the definitions of gamification mentions that its objectives are to encourage the development of specific behaviors [25], which is why gamification can motivate students to carry out sustainable practices and work on their civic competence in a playful way with the aim of acquiring more ecologically responsible behaviors [26]. These results may be due to the fact that the game elements have a positive influence on the motivation and participation of the students, improving their civic attitude and respect for the environment [27]. In relation to these results, gamification can also promote engagement and meaningful learning in social and civil key competences in higher education since it manages to favor a more interactive environment and the students become more involved when information and communication technology (ICT) is used in a playful way to learn [28]. Another example of the use of gamification for sustainable learning and self-determination in university education reports that the group that learned through online gamification had better results in the knowledge of sustainability, pro-environmental behavior, and performance than the control group. Qualitatively, they studied why this phenomenon could have occurred, and the students declared that their motivation for the program was the recognition, the competence, and the sense of belonging to a group [29].

1.3. Research Questions and Objective

The context of our study is the wide range of scientific results on educational gamification, often contradictory or using the term to refer to other types of recreational resources such as educational video games or game-based learning. Despite being a research topic that has gained strength in recent years, the results of educational gamification are still widely dispersed, creating the need for research to describe and synthesize the available information, reducing the time required to understand this educational strategy. Previous research shows us the interest in gamification as a learning tool. Huang et al. [30] carried out a meta-analysis study where they integrated 30 independent studies in formal educational settings, and it was observed that the effect size on learning outcomes was greater in the gamified groups than in the control groups. De Sousa, Durelli, Reis, and Isotani [31] explored other benefits of gamification in their systematic review where they analyzed 26 papers and observed that gamification could be implemented with the aim of motivating students, improving their skills, and maximizing learning. Their results show that gamification research has focused more on higher education to foster the engagement of students through learning activities that build on gamification concepts.

The objective of this research is to carry out a systematic review of studies that have developed a gamification methodology in the educational context in the last five years, based on established criteria. We propose the following research questions.

- RQ1:** *What is the distribution over time of the studies that examine educational gamification?*
- RQ2:** *What is the educational level where gamification is most studied?*
- RQ3:** *What have been the variables most analyzed in the selected studies?*
- RQ4:** *What are the advantages of gamification in educational settings?*
- RQ5:** *Which gamification elements are most used for educational purposes within the selected studies?*

The selection of these research questions has been made to gain a deeper understanding of the research and use of gamification in education in the last five years, as well as to identify which educational gamification programs have been most successful and how to

replicate them in future research. Following the study proposed by Dicheva, Dichev, Agre, and Angelova [32], RQ2 and RQ5 are carried out with the aim of checking and discussing whether the gamification elements proposed in scientific research have been maintained or changed in the following five years.

2. Methodology

A systematic review was carried out, following the recommendations of the pre-established reporting elements for systematic reviews and meta-analyses (PRISMA) [33]. We conducted a systematic literature review during April and June 2020 to ensure that we had compiled a list of relevant papers that was as complete as possible [34]. The systematic review seeks to gather all the available evidence according to previously specified eligibility criteria to answer the research questions; for this purpose, a systematic method was used that provides more reliable results to establish conclusions and, consequently, decision making [35].

To compile the studies analyzed in the systematic review, a search protocol was carried out [36]. The databases used to carry out the intended bibliographic review were Web of Science, Scopus, and Dialnet. The analyzed period corresponded to the last five years (2016–2020) and the search string used was: (School OR “High School” OR “University”) AND Gamif * AND (Program OR Intervention), in both English and Spanish. The search was run by title, abstract, and keywords. The chosen descriptors were selected to characterize the general lines of research in the field of educational gamification.

For the selection of the documents for the systematic review, inclusion criteria were determined:

- Regarding the language, only studies that were in English or Spanish were accepted. Studies that were in other languages were excluded, even if the abstract was in English or Spanish.
- Regarding the format, only articles that came from specialized scientific journals were accepted. Articles published on nonspecialized web pages, blogs, or digital newspapers, as well as books, book chapters, or doctoral theses, among others, were excluded.
- Regarding the group of recipients of the intervention, only studies that focused primarily on students and/or teachers from formal education contexts were accepted. Studies focused on socio-educational programs in nonformal contexts, such as socio-community intervention, educational programs for public health, and so forth, were excluded.
- Regarding the type of research, only quasi-experimental or experimental studies were accepted. Theoretical and reflective articles were excluded.
- Regarding the study topic, only those studies that specifically used educational gamification were accepted. Studies related to other recreational strategies, such as serious games, game-based learning, educational video games, or educational escape rooms, among others, were excluded.
- To adequately address the research questions asked, experimental studies that did not specify their sample, resources, and/or gamification elements used were also excluded.

Based on the previously defined parameters, various documents were selected and exported to a specific folder in the Endnote software, which allowed duplicate documents to be identified based on the digital object identifier (DOI) and the bibliographic reference of the source. Subsequently, the articles whose title, keywords, abstract, and content were not directly related to the research questions or did not meet all the inclusion criteria previously described were refined. Figure 1 shows the results obtained.

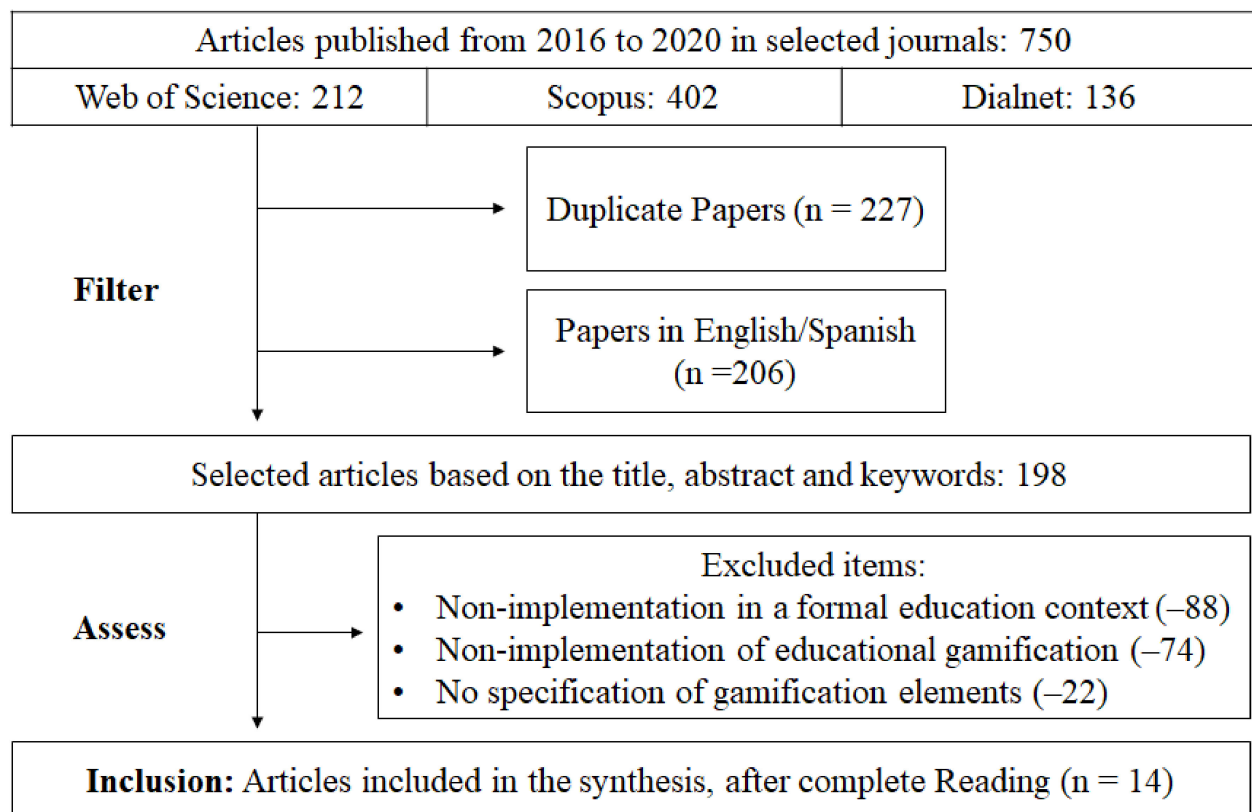


Figure 1. Diagram of search and selection of analyzed sources.

3. Results

In response to the first and second research questions: What is the distribution over time of the studies that examine educational gamification? What is the educational level where gamification is most studied?

A total of 750 articles were initially found as a result of the database research. After duplicate and language exclusion criteria application, 198 articles were selected and read. After applying the rest of the exclusion criteria, 14 full-text articles were analyzed in detail, meeting the eligibility criteria (see Table 1).

The research methodology imposed a year restriction, requesting only publication since 2016, with the aim of knowing the most current research on educational gamification programs. Figure 2 shows the evolution of the number of published articles selected with respect to the years and educational level. In 2019, the experimental articles on educational gamification had tripled, which shows the interest in this methodology to promote student motivation and their acquisition of academic knowledge. In addition, this finding suggests that the impact of gamification in education constitutes a growing research area. Regarding publications according to educational level, a homogeneous distribution is observed distributed among the different levels, with a considerable rise in university education.

Table 1. General distribution of the analyzed studies.

Author-ship	Journal Position (H Index), Cites	N	Education Level	Subject	Research Design	Duration	Gamification Elements	Variables	Results			Outcomes
									+	=	-	
[18]	Q2 (92), 4	292	School and high school	Physical education	Quasi-experimental with control group	20-week classroom-based PA intervention	Challenge, rewards, prize	Engagement Participation	X			Gamification can be a key strategy to encourage the participation of all students in physical activities.
[20]	E (NA), 1	64	University	Foundations of the curriculum and physical education	Quasi-experimental without control group	1 semester	Narrative, challenges, achievements, playful activities, action rewards, points	Academic achievement Intrinsic motivation Extrinsic motivation	X			The dynamics of gamification and continuous evaluation through the ICTs carried out have achieved high levels of participation and student participation, as well as high levels of motivation, both intrinsic and extrinsic. Students who used the GAME model had better learning outcome of scientific competencies than those who learned via traditional teaching way. The GAME model can promote students' learning engagement. Learning becomes learner-centered, which drives students to actively learn and control their own learning progress.
[21]	Q1 (86), 2	69	School	Sciences	Quasi-experimental with control group	6 weeks	Points, rewards, levels, and badges	Scientific competencies	X			Gamification is a way to promote work in the classroom, connecting with the interests of students and reinforcing the quality of learning through social interaction.
[22]	E (1), 29	10	High school	Industrial technology	Qualitative research with ad hoc questionnaire	3 weeks	Ranking, prizes, points, levels, badges	Fun learning	X			Gamification, implemented on a long-term basis, has been found an instructional framework capable of increasing students' motivation towards physical education.
[19]	Q1 (31), 4	290	School and high school	Physical education	Quasi-experimental without control group	15 weeks (2 sessions per week/50 min each)	Narrative, challenges goals, mastery, leaderboard, badges	Intrinsic motivation	X			For MSc students, gamification is good to introduce basic topics. The social components of the gamified platform made it possible for students to improve inter-relationships and their overall grades earned, and to consider the learning process as more involving, interesting, and attractive.
[23]	Q2 (26), 2	27	University	Master of Science (MSc) in Software Engineering for the Web	Quasi-experimental with control group	Two 5-hour lectures, delivered in two different weeks	Events, points, tasks, achievements, leaderboards, store inside the subject	Academic achievement	X			There is a notable correlation between gamified activity and the exam score. This demonstrates the value of gamification as a complement to traditional teaching.
[37]	Q1 (17), 5	47	University	Advanced quantum mechanics course	Quasi-experimental with control group	7 weeks (multiple voluntary lessons of 10–20 minutes per week)	Points, badges, and leaderboard framework	Academic achievement	X			

Table 1. Cont.

Author-ship	Journal Position (H Index), Cites	N	Education Level	Subject	Research Design	Duration	Gamification Elements	Variables	Results			Outcomes
									+	=	-	
[24]	Q1 (164), 46	49	University	Online seminar of psychology	Experimental with control group	1 semester	Badges	Intrinsic motivation			X	Badges did not seem to be influential regarding students' motivation, activity, and performance. Badges neither increased nor decreased students' motivation and activity during the course. Badges did not influence grades or quiz results. Instead, they found a general trend that students became less intrinsically motivated over time.
[38]	Q3 (13), 2	36	High school	Second language (English)	Quasi-experimental with control group	10 sessions	Narrative about famous TV games, points	Academic achievement	X			English vocabulary learning process has improved significantly.
[39]	Q1 (12), 1	31	High school	Ethical education	Quasi-experimental with control group	1 session, 50 minutes	Narrative, game design, roles, points	Engagement	X			Gamification could be an effective way to create the concept of professional commitment in adolescents.
[40]	66/226 – Dialnet (NA), 1	48	School	Physical education	Qualitative research with control group	14 sessions, 50 minutes	Narrative, ranking, badges, rewards	Academic achievement	X			Gamification promotes academic performance to learn healthy lifestyle habits.
[41]	Q1 (36), 35	36	University	Matter and Energy subject in Primary Education Degree	Quasi-experimental without control group	1 semester	Star Wars aesthetic, challenge, rewards, collaborative tasks, points	Academic achievement-Participation	X			A correlation between the participation level in the game and the academic marks that the students obtain is evident, and those who get involved in the game usually achieved better academic performance.
[42]	Q2 (43), 13	93	University	Psychology courses	Quasi-experimental with control group	1 academic year, 3 times a week for 50 minutes	Play, narrative, feedback, choice, points, levels, prize	Motivation	X	X		Implementation of some meaningful gamification elements, students report higher enjoyment, engagement, and motivation in learning compared to traditional courses.
[43]	Q3 (19), 30	94	School	Maths	Quasi-experimental with control group	6 weeks (120 minutes per week)	Competition, rewards, collecting points, rewards, badges, and leaderboard	Academic achievement Cognitive load	X			Gamification can increase both cognitive load and achievement levels, and students generally have positive thoughts regarding gamification strategies.

Note: NA: Not Available; E: Emerging.

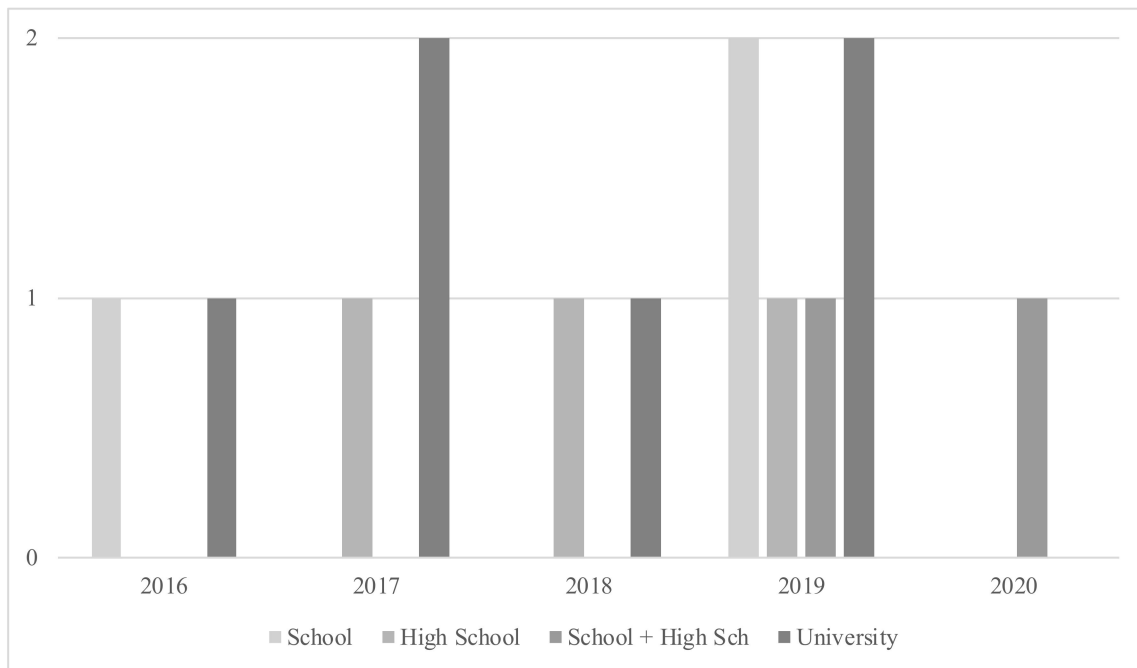


Figure 2. Number of selected published articles per year/education level.

Answering the third and fourth research question: What have been the variables most analyzed in the selected studies? What are the advantages of gamification in educational settings?

Regarding the analyzed variables, these are shown in Table 2 below:

Table 2. Distribution of studies by analyzed constructs.

MDA	Construct Analyzed	Frequency	% Relative	% Total
School	Academic achievement	2	28.6	8.7
	Cognitive load	1	14.3	4.3
	Intrinsic motivation	1	14.3	4.3
	Scientific competencies	1	14.3	4.3
	Engagement	1	14.3	4.3
	Participation	1	14.3	4.3
High School	Engagement	2	22.2	8.7
	Academic achievement	1	14.3	4.3
	Intrinsic motivation	1	14.3	4.3
	Fun	1	14.3	4.3
	Learning	1	14.3	4.3
	Participation	1	14.3	4.3
University	Motivation	1	11.1	4.3
	Academic achievement	4	44.4	17.4
	Participation	1	11.1	4.3
	Intrinsic motivation	2	22.2	8.7
	Extrinsic motivation	1	11.1	4.3
TOTAL		23	-	100

Improved student academic achievement, engagement, and motivation were observed as the most significant benefits of gamification in all the educational levels. The analysis shows that 92.86% of the studies report positive results in the variables studied, except for the research carried out by Kyewski and Krämer [24], who stated that badges did not

positively influence student motivation if they were not intrinsically less motivated as the semester.

Finally, in response to the fifth research question: Which gamification elements are most used for educational purposes within the selected studies?

Table 3 shows how the most used gamification elements within the educational gamification are points, medals, and rankings, coinciding with one of the most used methods in game design, known as the PBL triad [44]. The use of the narrative as an element of immersion and engagement is also highlighted. Regarding the research by Dicheva, Dichev, Agre, and Angelova [32], it can be observed that points, badges, rankings, and rewards continue to lead educational gamification programs. However, it is very important to note that narrative and challenges are gaining importance when designing educational gamifications.

Table 3. Gamification elements applied in studies.

Gamified Elements	Element Analyzed	Frequency	% Relative	% Total
Mechanics	Rewards	6	16.7	10.5
	Prize	3	8.3	5.3
	Achievements	1	2.7	1.7
	Points	10	27.8	17.5
	Levels	3	8.3	5.3
	Badges	7	19.4	12.3
	Ranking	6	16.7	10.5
Dynamics	Challenge	4	30.8	7.0
	Playful activities	2	15.4	4.3
	Events	1	7.8	1.7
	Tasks	2	15.4	4.3
	Roles	1	7.8	1.7
	Feedback	1	7.8	1.7
	Choices	1	7.8	1.7
	Competition	1	7.8	1.7
Aesthetics	Narrative	8	100	14.0
TOTAL		57	-	100

4. Discussion

This study has provided a systematic analysis of gamification systems at different educational levels of formal education. Understanding in depth how educational gamification programs are designed and executed is essential for their success in academic training and student motivation, and we emphasize that a comprehensive analysis can benefit both professional teachers who implement these educational gamification strategies and the scientific community that proposes its studies. Overall, the results suggest that gamification can have positive effects on student motivation, engagement, and academic performance at different educational levels. These findings provide evidence that educational gamification could be an effective educational strategy.

Educational gamification arouses great interest in the education sector, and it is a growing trend [43]. Regarding educational level, it carries out more gamification programs. Educational gamification takes place within a multitude of contexts of use. The analysis carried out shows that there is a greater interest in the field of university education, focusing more commonly on increasing school achievement. However, other new lines of interest in research on educational gamification could be the combination with teaching methodologies such as project-based learning [44] or gamification in online learning environments [45] as well as in different subjects. For example, Santos-Villalba et al. [46] demonstrate the positive relationship between the use of educational gamification and the attitude towards sustainability, both in the students and in the teachers themselves. The

authors mention that teachers must be trained on the methodology and its application to the classroom context, as well as plan and select the appropriate games or game elements for their didactic purpose to promote their motivation and adapt to the students' learning pace. On the other hand, Ouariachi, Li and Elving [47] investigated that the challenges proposed in playful strategies can be directly connected with the emotional dimension, increase public social awareness along with emotional connections, pointing to a change in pro-environmental behavior. They also point out that greater participation is achieved through active actions than in environmental knowledge transfer activities, and this makes gamification a potential learning strategy for the sustainability of learning. These results also coincide with one of the articles analyzed in our research [39], which reports positive results in ethics education through the application of educational gamification.

Although the use of gamification strategies is likely to increase in these contexts, it should be considered that when these strategies are adopted in the educational context, there should be the possibility of choosing not to participate so that the process is voluntary and based on intrinsic motivation of the students. Researchers should also look for more possible areas of application of gamification in the field of education.

This study concludes that the most analyzed variables are motivation, academic achievement, and engagement, followed by participation, fun, and other cognitive variables. The most studied variable is educational motivation, and the studies analyzed, apart from [24], conclude that gamified strategies promote student motivation. It is interesting to note that these studies used only badges, which was why extrinsic motivation was encouraged, performing tasks to get the medal. When only rewarded with medals, the students at the end worked only for that reason and intrinsic motivation was extinguished [48]. However, generally, gamification as a learning tool in education can provide an attractive and motivating approach given its ability to teach and reinforce curricular content and competencies [49]. The other variable frequently analyzed in studies on educational gamification is academic achievement. The studies analyzed show quite encouraging results on the improvement of academic performance through educational gamification. This phenomenon can be explained by a greater motivation towards the subject [50], by an increase in classroom flow [51], or by a change in teaching methodologies, leaving behind the more traditional one-way transmissive teacher–student teaching for a more active teaching, where students learn through challenges and significant tasks [52]. It is assumable that when students, regardless of educational level, have tasks that they consider significant wrapped in a pleasant narrative for them, they can have greater motivation towards the task and reinforce desirable study habits. It would also be worth inspecting how educational gamification can affect altering negative student behaviors such as disruptive behaviors in the classroom or truancy.

The balanced design of the different elements (mechanics, dynamics, and aesthetics) of gamification is considered to be what allows an increase of the engagement and motivation of the students. Most of the studies analyzed, as well as other studies of a qualitative nature [53], used different mechanics and dynamics, highlighting the points–badges–leaderboards (PBL) triad [54], even though other studies [55] varied their indiscriminate use, which may favor only working from extrinsic motivation, which ultimately has a negative impact on the intrinsic motivation of students. This fact must be analyzed and considered when designing playful learning strategies, since although the design of PBL may be simpler, and it is understandable that it will be used in the first gamification designs, it is important to advance to other systems of deeper gamification integrating different dynamics, mechanics, and aesthetics that can act as reinforcers of intrinsic motivation of the students. The importance of observing the environment and care in design is highlighted to generate a greater impact on motivation, considering the “environment with clear objectives, challenging tasks and authentic stories in which team spirit is reinforced through games, discussions and mechanics debates” [8:18]. Our study has revealed that when a gamified environment with different mechanics, dynamics, and aesthetics is created, the students obtain better results. This may be related to the theory of player types [16].

When creating an educational gamification program, it is important to know the students and probe what types of games they play and how they interact with each other in order to personalize the program and be able to offer a motivating MDA.

After conducting this research, the main repercussions of gamification in the educational field are discussed. In the first place, gamification stands out as a motivating learning strategy for students. Gamification can provide fun solutions to a big problem in the educational community, demotivation and school failure. Gamification can be motivating for students because it presents different elements of games that are challenging and fun for them. Second, the results of this research also highlight that academic performance achieves good scores when educational gamification is applied, since students are more engaged and participatory than in traditional classes.

5. Limitations of the Present Study and Suggestions for Future Research

In general, systematic literature reviews are proven methods in social science research [56]. As strengths of the systematic review with the PRISMA methodology, its transparency and openness to criticism stand out. However, like any research method, there are limitations both in terms of the methodology itself and the application in particular [57]. Some limitations apply to this review. This study focused only on experimental academic research published in academic journals, without considering other research considered grey literature and book chapters. We consider this acceptable due to the number of articles reviewed (198 articles reviewed in full text). The language limitation is added; the articles reviewed have been in English and Spanish, having to discard other articles that could have been included in the analysis. Consequently, there was a risk of publication bias for the validity of the systematic review. The issues limit the generalizability of the review results. However, the strength of this review is that it brings together a collection of studies that show the effectiveness of educational gamification in the formal educational context, studying the specific elements of gamification used.

After conducting this systematic review, a growing interest in research in the use of educational gamification strategies was observed. More than half of the selected articles were in high-impact scientific journals. These articles coincided with research that used a more standardized, quasi-experimental or experimental scientific method with a control group. Furthermore, a limitation of the articles in lower quartiles has been the lack of information, for example, the lack of the number of participants differentiated into the control group and the experimental group or a less exhaustive wording of the gamification used. It is noteworthy that most research on educational gamification report positive results [58]. However, the gamification approach may not be suitable for all students, as it depends on the gamification elements used and on the individual characteristics of each student such as their type of player, educational needs, and personal interests. Most studies did not specify why they used a specific aesthetic, and it is a very important element of gamification as an element of initial engagement [59] since if the narrative and aesthetics are known and/or shocking for students, the commitment to gamification will be greater. It is also important to know the student's player profile when selecting mechanics and dynamics, since, for example, the players who are socializing more will be more interested in collaborative dynamics than in competition [60]. In future research, attention should be paid to the demographics of the participants: age, gender, experiences with the game, types of players, and previous experience with the game and video game, as they may have a potential impact on the results obtained. Furthermore, in the 14 papers reviewed, the designs, methods, and variables studied vary considerably. Participant recruitment was predominantly by convenience and in most it was not specified that the gamification program was voluntary. The timing of the evaluation is also not identified in most cases; it is assumed that it was immediately after applying the program. For future work, the potential of gamification and retention of long-term positive results could be studied.

6. Conclusions

The main objective of this research was to gain a better understanding of the phenomenon of educational gamification. After the systematic literature review, it has been established that the use of gamification can be beneficial at different educational levels, from school to university. The systematic review identified several benefits of the use of gamified learning in students such as an improvement in their motivation, engagement, and academic achievement. This review also identified the main gamification elements used in education, being points, medals, rankings, and narrative. However, it is valued that when only one or two gamified elements are used, such as points or badges, the effects on student motivation are less or may even be negative. This research reinforces the idea that a varied gamified environment is more motivating and can meet their needs according to their player profiles, coinciding with other research by Kocadere and Çağlar [61]. This study tries to advance the development of theoretical and experimental efforts to analyze and develop playful learning strategies that improve the quality of teaching. Our next steps to advance these notions, in terms of experimental research, will be to study how to use educational gamification more efficiently at different levels of formal education, exploring different mechanics and dynamics depending on the type of students and their training needs.

Author Contributions: Conceptualization, A.M.-L. and J.M.A.-P.; methodology, A.M.-L. and R.T.; software, R.T.; validation, A.M.-L., M.A.G. and A.A.; formal analysis, A.M.-L.; investigation, J.M.A.-P.; resources, L.G.-P. and P.C.-L.; writing—original draft preparation, A.M.-L.; writing—review and editing, A.M.-L. and R.T.; visualization, A.M.-L.; supervision, J.M.A.-P.; project administration, J.M.A.-P.; funding acquisition, L.G.-P., P.C.-L. and M.A.G. All authors have read and agreed to the published version of the manuscript.

Funding: This research has been funded, in part, by the Ministry of Universities through the University Teacher Training Program (FPU2019). The support of the Ministry does not imply acceptance of its contents, which is the sole responsibility of the authors.

Institutional Review Board Statement: The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Institutional Review Board of Bioethics Committee of University of Almeria (Ref. 126/2020).

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

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