

Gamification as a Learning Strategy

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The use of games for purposes other than mere entertainment dates back to very ancient stages of humanity itself. In the context of education and learning, the interest of researchers for their uses and effects is a more recent character, around the 1970s when Clark Abt coined the term serious game. He defined serious games as “those that have an explicit and carefully thought-out educational purpose and are not intended to be played primarily for amusement. This does not mean that serious games are not, or should not be, entertaining” (p. 27). This means that “the ‘seriousness’ of these games refers to a content that may well be used as teaching material by teachers” (p. 27). However, the interest in the educational use of games grew especially since the early 2000s when some game designers began looking for strategies to transfer the excitement and joy of playing to the real world. In its origin, this process adopted different names as playful or gameful design, but in 2002 Nick Pelling coined the term gamification to refer to the use of the game in contexts other than the game. Thus, a term that originated in the digital media industry was largely adopted in all potential application areas, including education.

game-based learning

1. Gamification as a Learning Strategy: Some Conceptual Details

The use of games for purposes other than mere entertainment dates back to very ancient stages of humanity itself. In the context of education and learning, the interest of researchers for their uses and effects is a more recent character, around the 1970s when Clark Abt coined the term serious game ^[1]. He defined serious games as “those that have an explicit and carefully thought-out educational purpose and are not intended to be played primarily for amusement. This does not mean that serious games are not, or should not be, entertaining” ^[2] (p. 27). This means that “the ‘seriousness’ of these games refers to a content that may well be used as teaching material by teachers” ^[3] (p. 27). However, the interest in the educational use of games grew especially since the early 2000s when some game designers began looking for strategies to transfer the excitement and joy of playing to the real world ^[4]. In its origin, this process adopted different names as playful or gameful design, but in 2002 Nick Pelling coined ^[5] the term gamification to refer to the use of the game in contexts other than the game. Thus, a term that originated in the digital media industry was largely adopted in all potential application areas, including education.

Gamification became increasingly popular in the context of learning, especially through the last decade, such that it is now called gamified learning ^[6]. As we noted, it could be broadly described as the application of playful thinking, and game mechanics, in non-game contexts to engage users in problem-solving or task completion ^[7]. As the application of game dynamics grew in the educational context, it also grew the heterogeneity of the approaches

and therefore the terms and applications (e.g., serious games, game-based learning, gamified learning, gamification). Despite the fact that it is not unusual to identify gamified learning just with the use of digital games for teaching and learning purposes, the main objective of all these applications is to educate or to train, often combining the experienced enjoyment and the necessary concentration through challenging tasks when the maximum is reached using one's own skills [8]. As Sailer and Hommer noted [6], these applications share a common game design element toolkit [9], and a focus on adding value beyond entertainment [10], or, in other words, on building meaningful and useful learning based on entertainment and fun. In fact, the research literature on gamified learning and game-based learning overlap, although they are different in nature [6]. The main difference between the both is that whereas gamified learning is fundamentally a learning design change process that adds game elements, game-based learning approaches are a product, in the sense that they involve the design of complete (serious) games [6] (p. 78). These serious games “are typically designed to fulfill the role of instructor by actually providing instructional content to learners” [11]. Thus, the true fundamental key has to do with the use of game mechanics and design elements to generate learning. In this regard, it comes out of a growing body of empirical research that supports that the use of game elements tends to positively impact several types of learning outcomes [6] as well as several valuable issues, such as motivation, and engagement: a specific type or work-related subjective well-being [12] that might be critical for healthy students [13].

2. Does Game-Based Learning Work in HIEs? Its Theoretical Foundation

The incorporation of gamification in the learning process is being considered as a significant factor in the success of teaching, learning, and research in HIEs [14]. As noted above, gamified learning and game-based learning (GBL) tend to exert positive effects on learning outcomes and the learners themselves. For example, it has been pointed out that the development of basic personal skills, including highly valuable soft skills for organizations such as those related to teamwork, as well as learning in a variety of subjects, can be effectively supported by games in an efficient, attractive and motivating way [6][15][16][17][18]. However, the use of games for learning purposes in HIEs is not without controversy, not only in terms of whether and to what extent their effects are always beneficial [19] but also with respect to their theoretical foundation [6][20].

From a theoretical point of view, the most widely used frameworks to explain the relationship between learning and the use of games have been the theory of gamified learning and the self-determination theory (SDT) [6][19][20][21]. Very succinctly (see a longer description [6][11][19][20][21][22]) the theory of gamified learning [11] postulated that GBL influences learning through four components—such as instructional content, behaviors and attitudes, game characteristics, and learning outcomes—being the critical issue to the success of any GBL effect that “the instructional content in place is already effective” [11] (p. 9). Self-determination theory (SDT) postulated that “an understanding of human motivation requires a consideration of innate psychological needs for competence, autonomy, and relatedness” [21] (p. 227). Its application in the context of GBL implies that the satisfaction of these needs in students will positively influence their intrinsic motivation, and, will subsequently lead to high-quality learning. In this process the environment in which the satisfaction of those needs takes place is essential. Thus,

the incorporation of game mechanics to the instructional content in these environments allows their modification and enrichment, and therefore, they can positively affect learning outcomes. Students intrinsically motivated through the use of games for learning chose more difficult assignments and produced higher-quality artifacts [23], retained information better, were generally happier and more engaged [24].

Finally, a third theory has also been more recently identified as one of the most common theoretical frameworks [20] in the GBL arena: Csikszentmihalyi's flow theory [25][26]. The concept of flow can be broadly conceptualized as a state of deep absorption in an activity that is inherently pleasant [26][27]. Therefore, this theory postulates that challenging activities (e.g., playing a game for learning purposes) might lead people who are immersed in to experience a state of flow [20]. These flow experiences can be considered states of absolute absorption or intense concentration in an activity, and in educational contexts, deep absorption in activities could promote optimal learning experiences [27]. Based on this theory, it can be argued that gaming activities could potentially induce learners to a state of flow if the challenge is adjusted to their skill level, leading them to experience feelings of enjoyment, creative achievement, and satisfaction [20][27] while learning. The fundamental issue seems to be the balance between "the inherent challenge of the activity and the player's ability to address and overcome it in order to maintain a player's flow experience" [27] (p. 1186).

Together, these three theories provide us with important arguments to consider that the incorporation of the game for learning purposes is effective and efficient. Firstly, GBL is not intended to replace instructional learning materials [6][11]. In fact, the quality of instructional content is essential: if this content does not help college students to learn, gamified learning itself cannot produce learning [28]. Second, the game characteristics should help support psychological needs such as competence, autonomy, and empathy [21][22][23][24][28]. In this sense, the combination of collaboration (e.g., playing the game in teams) and competition (for example, the winning team is getting an award) could positively affect learning-related behaviors and outcomes [6]. The application of missions in GBL could foster the creation of such kinds of social interactions. Missions provide explicit learning goals for players in a meaningfully engaging way [28], as well as to practice activities to support competency and autonomy [29]. Finally, this game-based learning experience will be intrinsically motivating. So, if the level of challenge is adjusted to the level of skill of the learners, the serious game might provide players an experience of flow and feelings of enjoyment, creative achievement, and satisfaction [20][27]. Indeed, some recent meta-analyses showed that if these considerations are taken into account, the use of the game will positively affect learning in university settings.

3. Game-Based Learning in HIEs: Some of Its Effects on Learning and Related Outcomes

As noted above, research in this field has grown quickly recently. More specifically, Subhash and Cudney [16] considered that the turning point for the growth of this area in HIEs may be around the early years of the last decade. They systematically reviewed studies published from 2012 until 2017 and revealed some important key findings. Using games for learning purposes has benefits such as improving college students' confidence, practical skills, perceived learning, academic effort, and psychological satisfaction. The most significant results were the improvement of students' performance, motivation, enjoyment, and engagement: in approximately 50% of the

reviewed studies, Subhash and Cudney [16] found GBL positively affected a key indicator such as subjective well-being. It is interesting to note that even some of these studies identified that the experienced engagement had a positive effect on learning [8], in line with what was stated in a previous point in relation to flow theory [25][26][27][28].

The review by Kalogiannakis et al. [30] yielded similar results. They analyzed 24 empirical research papers published from 2012 to 2020 and concluded that four outcomes stood out: motivation, engagement, learning achievements, and social interaction. The results revealed that all studies that measured both motivational and learning outcomes, reported increased learning outcomes and also showed improved motivation, as well as positive feelings and learning-related behaviors, such as engagement. Based on these findings, the authors stated that their results indicated a strong connection between motivational and engaging outcomes and significant learning outcomes, in line with that previous research supporting that the engaged and motivated students were also very likely to achieve significant learning results.

Zainudin et al. in 2020 [20] developed a systematic literature review of 46 empirical papers published between 2016 and 2019 related to the effects of gamified learning and GBL. From their review, the main areas of positive influence were engagement, motivation, academic performance, and interaction and socialization. The authors concluded that the introduction and use of game elements with learning purposes could increase student engagement and motivation, improve academic performance, encourage interaction and socialization, and offer opportunities to develop autonomous learning skills.

In summary, the intrinsic motivation and engagement of college students are some of the most frequent and reported outcomes derived from the use of GBL [31]. Student engagement, more recently called academic engagement, has been linked to self-esteem, satisfaction with studies, and academic performance [32] and characterizes healthy individuals. However little research has examined this experience in HIEs from the point of view of the team, or in other words, the so-called teamwork engagement: “a shared, positive, fulfilling, motivational emergent state of work-related well-being” [33] (p. 35). Social interaction constitutes an essential part not only of game-based learning applications [30] but also of the university training and learning process itself. Interpersonal relations play a key role in students’ outcomes, experiences, and emotions, as well as in the development and promotion of relevant soft skills, highly valued in workplaces, without threatening college students’ well-being, enhancing their feelings of teamwork engagement.

Regarding the effects of GBL, it is important to note that some studies have reported an improvement in several soft skills related to teamwork, such as students’ confidence for teamwork and team building, creativity, and innovation behaviors [34][35][36]. Team building has been defined as “the formal and informal team-level interventions that focus on improving social relations and clarifying roles as well as solving task and interpersonal problems that affect team functioning” [37] (p. 9). Some studies showed that GBL improved communication, collaboration, problem-solving, and goal setting among group members, and influenced their perceptions of being and feeling as a team [38][39]. Innovation work behaviors (IWB) involve the intentional and successful introduction of a new idea, process, or product. The most recent conceptualizations of this IWB construct [40] consider it might encompass

creativity, or “the production of novel and useful ideas” ^[41] (p. 3) and innovation “the successful implementation of creative ideas” ^[41] (p. 3).

Despite its value, most of the research conducted comes from the application of GBL through digital games that might not provide face-to-face interaction, while in a classroom situation, student–student interactions could have a profound impact on the improvement and acquisition of basic competencies as soft skills for teamwork. This could also be more crucial in those college students of Health Sciences and Social Work. In the exercise of their professional career, cooperation and teamwork usually involve face-to-face interaction and coordination with other professionals and even with the users of the service. Therefore, more research is needed regarding face-to-face game-based learning tools that could contribute to fostering teamwork among such undergraduates.

References

1. Abt, C.C. *Serious Games*, 2nd ed.; University Press of America: Lanham, MD, USA, 1987.
2. Djaouti, D.; Alvarez, J.; Jessel, J.P.; Rampnoux, O. Origins of Serious Games. In *Serious Games and Edutainment Applications*; Ma, M., Oikonomou, A., Jain, L., Eds.; Springer: London, UK, 2011; pp. 25–43.
3. Djaouti, D.; Alvarez, J.; Jessel, J.P. Classifying serious games: The G/P/S model. In *Handbook of Research on Improving Learning and Motivation through Educational Games: Multidisciplinary Approaches*; Felicia, P., Ed.; IGI Global: Pennsylvania, PA, USA, 2011; pp. 118–136.
4. Shpakova, A.; Dörfler, V.; MacBryde, J. Gamification and innovation: A mutually beneficial union. In *Proceedings of the British Academy of Management Annual Conference: Thriving in Turbulent Times*, Newcastle, UK, 6–8 September 2016; pp. 1–18.
5. Pelling, N. The (Short) Prehistory of “Gamification”.... *Funding Startups (& Other Impossibilities)*. 2011. Available online: <https://nanodome.wordpress.com/2011/08/09/the-shortprehistory-of-gamification/> (accessed on 16 September 2021).
6. Sailer, M.; Homner, L. The Gamification of Learning: A Meta-analysis. *Educ. Psychol. Rev.* 2020, 32, 77–112.
7. Deterding, S.; Sicart, M.; Nacke, L.; O’Hara, K.; Dixon, D. Gamification. using game-design elements in non-gaming contexts. In *Proceedings of the CHI’11 Extended Abstracts on Human Factors in Computing Systems*, Vancouver, BC, Canada, 7–12 May 2011; pp. 2425–2428.
8. Hamari, J.; Shernoff, D.J.; Rowe, E.; Coller, B.; Asbell-Clarke, J.; Edwards, T. Challenging games help students learn: An empirical study on engagement, flow and immersion in game-based learning. *Comput. Hum. Behav.* 2016, 54, 170–179.
9. Landers, R.N.; Auer, E.M.; Collmus, A.B.; Armstrong, M.B. Gamification science, its history and future: Definitions and a research agenda. *Simul. Gaming* 2018, 49, 315–337.

10. Deterding, S.; Dixon, D.; Khaled, R.; Nacke, L. From game design elements to gamefulness: Defining “gamification”. In *Proceedings of the 15th International Academic Mindtrek Conference: Envisioning Future Media Environments*, Tampere, Finland, 28–30 September 2011; Lugmayr, A., Ed.; ACM Publication: New York, NY, USA, 2011; pp. 9–15.
11. Landers, R.N. Developing a theory of gamified learning: Linking serious games and gamification of learning. *Simul. Gaming* 2014, 45, 752–768.
12. Bakker, A.B.; Oerlemans, W. Subjective psychological well-being in organization. In *The Oxford Handbook of Positive Organizational Scholarship*; Cameron, K.S., Spreitzer, G.M., Eds.; Oxford University Press: New York, NY, USA, 2011; pp. 178–189.
13. Salanova, M. Work engagement: A key to HEROs—healthy and resilient organizations. In *A Research Agenda for Employee Engagement in a Changing World of Work*; Meyer, J., Schneider, B., Eds.; Edward Elgar Publishing: Ghelthenham, UK, 2021; pp. 53–66.
14. Ofosu-Ampong, K.; Boateng, R.; Anning-Dorson, T.; Kolog, E.A. Are we ready for Gamification? An exploratory analysis in a developing country. *Educ. Inf. Technol.* 2020, 25, 1723–1742.
15. Vegt, N.; Visch, V.; de Ridder, H.; Vermeeren, A. Designing Gamification to Guide Competitive and Cooperative Behavior in Teamwork. In *Gamification in Education and Business*; Reiners, T., Wood, L., Eds.; Springer: Cham, Denmark, 2015; pp. 513–533.
16. Subhash, S.; Cudney, E.A. Gamified learning in higher education: A systematic review of the literature. *Comput. Hum. Behav.* 2018, 87, 192–206.
17. Bilro, R.G.; Loureiro, S.M.; Angelino, F.J. The Role of Creative Communications and Gamification in Student Engagement in Higher Education: A Sentiment Analysis Approach. *J. Create. Commun* 2021. ahead-of-print.
18. Sailer, M.; Sailer, M. Gamification of in-class activities in flipped classroom lectures. *Br. J. Educ. Technol.* 2021, 52, 75–90.
19. Hammedi, W.; Leclercq, T.; Poncin, I.; Alkire, L. Uncovering the dark side of gamification at work: Impacts on engagement and well-being. *J. Bus. Res.* 2021, 122, 256–269.
20. Zainuddin, Z.; Chu, S.K.; Shujahat, M.; Perera, C.J. The impact of gamification on learning and instruction: A systematic review of empirical evidence. *Educ. Res. Rev.* 2020, 30, 100326.
21. Ryan, R.M.; Deci, E.L. Self-determination theory and the facilitation of intrinsic motivation, social development, and wellbeing. *Am. Psychol.* 2000, 55, 68–78.
22. Kwon, H.Y.; Özpolat, K. The dark side of narrow gamification: Negative impact of assessment gamification on student perceptions and content knowledge. *INFORMS Trans. Educ.* 2021, 21, 67–81.

23. Hew, K.F.; Huang, B.; Chu, K.W.; Chiu, D.K. Engaging asian students through game mechanics: Findings from two experiment studies. *Comput. Educ.* 2016, 92–93, 221–236.
24. Hanus, M.D.; Fox, J. Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance. *Comput. Educ.* 2015, 80, 152–161.
25. Csikszentmihalyi, M. *Flow: The Psychology of Optimal Experience*; Harper & Row: New York, NY, USA, 1990.
26. Csikszentmihalyi, M. Toward a Psychology of Optimal Experience. In *Flow and the Foundations of Positive Psychology*; Csikszentmihalyi, M., Ed.; Springer: Dordrecht, The Netherlands, 2014; pp. 209–226.
27. Admiraal, W.; Huizenga, J.; Akkerman, S.; Ten Dam, G. The concept of flow in collaborative game-based learning. *Comput. Hum. Behav.* 2011, 27, 1185–1194.
28. Huang, R.; Ritzhaupt, A.D.; Sommer, M.; Zhu, J.; Stephen, A.; Valle, N.; Hampton, J.; Li, J. The impact of gamification in educational settings on student learning outcomes: A meta-analysis. *Educ. Technol. Res. Dev.* 2020, 68, 1875–1901.
29. Landers, R.N.; Bauer, K.N.; Callan, R.C.; Armstrong, M.B. Psychological Theory and the Gamification of Learning. In *Gamification in Education and Business*; Reiners, T., Wood, L., Eds.; Springer: Cham, Denmark, 2015; pp. 165–186.
30. Kalogiannakis, M.; Papadakis, S.; Zourmpakis, A.-I. Gamification in Science Education. A Systematic Review of the Literature. *Educ. Sci.* 2021, 11, 22.
31. Schaufeli, W.B.; Salanova, M.; González-Romá, V.; Bakker, A.B. The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *J. Happiness Stud.* 2002, 3, 71–92.
32. Carmona-Halty, M.; Salanova, M.; Llorens, S.; Schaufeli, W.B. Linking positive emotions and academic performance: The mediated role of academic psychological capital and academic engagement. *Curr. Psychol.* 2021, 40, 2938–2947.
33. Costa, P.; Passos, A.M.; Bakker, A. Empirical validation of the team work engagement construct. *J. Pers. Psychol.* 2014, 13, 34–45.
34. Qian, M.; Clark, K.R. Game-based Learning and 21st century skills: A review of recent research. *Comput. Hum. Behav.* 2016, 63, 50–58.
35. Sousa, M.J.; Rocha, Á. Leadership styles and skills developed through game-based learning. *J. Bus. Res.* 2019, 94, 360–366.
36. Ifenthaler, D.; Eseryel, D.; Ge, X. Assessment for game-based learning. In *Assessment in Game-Based Learning*; Ifenthaler, D., Ed.; Springer: New York, NY, USA, 2021; pp. 1–8.

37. Klein, C.; Diaz Granados, D.; Salas, E.; Le, H.; Burke, C.S.; Lyons, R.; Goodwin, G.F. Does team building work? *Small Group Res.* 2009, 40, 181–222.
38. Vásquez, S.; Peñafiel, M.; Cevallos, A.; Zaldumbide, J.; Vásquez, D. Impact of Game-Based Learning on Students in Higher Education. In *Proceedings of the 9th Annual International Conference on Education and New Learning Technologies (EDULEARN17)*, Barcelona, Spain, 3–5 July 2017; Chova, L., López, A., Candel, I., Eds.; IATED Academy: Barcelona, Spain, 2017; pp. 4356–4363.
39. Martín-Hernández, P.; Gil-Lacruz, A.I.; Gil-Lacruz, M.; Tesán, A.C.; Azkue, J.L. Working and Feeling as a team using gamification amongst university students. In *EDULEARN20 Proceedings, Proceedings of the 12th Annual International Conference on Education and New Learning Technologies*, Palma de Mallorca, Spain, 6–7 July 2020; Chova, L., López, A., Candel, I., Eds.; IATED Academy: Palma de Mallorca, Spain, 2020; pp. 1729–1735.
40. Becuwe, A. Work–Innovative Behavior at Work. In *Innovation Economics, Engineering and Management Handbook 1: Main Themes*; Uzunidis, D., Kasmi, F., Adato, L., Eds.; John Wiley & Sons: London, UK, 2021; pp. 397–402.
41. Mulligan, R.; Ramos, J.; Martín, P.; Zornoza, A. Inspiring Innovation: The Effects of Leader-Member Exchange (LMX) on Innovative Behavior as Mediated by Mindfulness and Work Engagement. *Sustainability* 2021, 13, 5409.

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