

## UTILIZING GAMIFICATION CONCEPT IN DIGITAL MARKETING: AN OVERVIEW OF RECENT RESEARCH EFFORTS

ANTUN BILOŠ

Faculty of Economics in Osijek  
Josip Juraj Strossmayer University of Osijek  
Gajev trg 7, 31000 Osijek, Croatia  
abilos@efos.hr

### ABSTRACT

*The gamification usually refers to the utilization of game design principles and game mechanisms in non-game contexts in order to drive a specific desired behavior. This concept has relatively recently sparked both academic and professional interest. In the last ten-odd years, gamification principles has been used successfully in many fields and lines of work: education and e-learning, human-computer interaction, information studies, health, psychology, consumer behavior, tourism and many others. In a broader sense of the concept, gamified ideas have been in use for decades despite the fact that the terminology is of a more recent date. In theory, primary gamification goals align with the goals of fundamental marketing philosophy. Its utilization has also become popular in the internet information space and platforms related to digital marketing for various goals, especially for increasing user engagement. The aim of this paper is to explore conducted research and studies of gamification concept applied in the wider context of digital marketing. The research overview illustrates the main areas of gamification utilization and its use efficiency in various settings and scenarios. In addition, the paper aims to provide a foundation for comprehensive future research activities. The implications of these findings are valuable as the explored gamification mechanisms have virtually limitless fields of application but are still unjustifiably and insufficiently researched.*

**KEYWORDS:** gamification, user behavior, user engagement, digital marketing, research overview

### 1. INTRODUCTION

The gamification concept has drawn the attention of scientists and researchers, practitioners and business professionals in many fields of theory and practice. Gamification is actually not a new concept but has been present in diverse forms for decades [Dexter & Yazdanifard, 2015] or more. In the course of the last 10-odd years, gamification has become a popular method of “enriching information technologies” [Morschheuser et al., 2017]. Regardless of the available insights on positive and negative effects and possible applications of gamification, there are still many inconsistencies and unanswered questions about gamification as a concept, its effectiveness and validation related to engaging users in different contexts and scenarios.

One of the reasons for the current professional and academic growing interest in the gamification concept is the success of videogames and its position in the entertainment industry, as the global videogame market should reach 178 billion US dollars in 2021 [Statista, 2021]. Scientists and researchers tend to agree that there is a special connection between the human brain and the concept of playing while games are “firmly entrenched in human culture” and continue to affect our social and professional lives, as Seaborn and Fels [2015] have nicely put. In other words, “human beings are hardwired to play” [Buckley et al., 2019].

There is no clear consensus among the observed studies if gamification takes place online, offline or both. However, most research efforts and studies refer to it as an online concept [Schöbel et al., 2020] even though its application is not limited to the online environment. Interestingly enough, even though the gamification concept may look simple at first, “the analyzed work demonstrates that gamifying (...) is not” [Dicheva et al., 2020]. In order to successfully deploy the gamification concept, specific psychological characteristics of users must be targeted, and gamification elements must be selected to affect those characteristics [Landers, 2018].

The concept of gamification has also become popular in the vast internet information space and platforms related to digital marketing for various goals. This paper aims to explore available research and studies of the gamification concept applied in the wider context of digital marketing.

## **2. THE CONCEPT OF GAMIFICATION**

The term gamification is usually defined as the use of game design elements and mechanisms in non-game contexts [Deterding et al., 2011a; Domínguez et al., 2013]. Buckley et al. [2019] elaborated the term as a “suite of techniques and psychological prompts” related by association with games and playing. The concept utilizes a number of psychological theories, mostly using motivational models [De-Marcos et al., 2014; Plass et al., 2015]. Deterding et al. [2011a] suggest that the term was coined in the digital media industry and the first documented mention is from 2008. However, the same authors argue that the term did not get widespread until the second half of 2010.

Schöbel et al. [2020] explored several prominent definitions of the term gamification [Deterding et al., 2011a; Hamari et al., 2014; Ašeriškis & Damaševičius, 2014 and several other studies] and continued to provide a proposed unified definition of gamification as “using games or game design elements in both digital and non-digital non-entertainment-based contexts in order to achieve desired outcomes”. Consequently, gamification should stimulate “a sense of playfulness” in non-game environments in a way that participation becomes enjoyable and desirable [Thom et al., 2012].

Huotari and Hamari [2016] proposed the definition of gamification in line with service marketing theory as: “a process of enhancing a service with affordances for gameful experiences in order to support users’ overall value creation.” The authors focused on the experiences that gamification should deliver which is related to its experiential nature. Seaborn and Fels [2015] argued that the concept of gamification is “emerging against a growing backdrop of empirical participants-based research” suggesting a dominant path for current research efforts but also subtly hinting that there is a vast area of unexplored research possibilities.

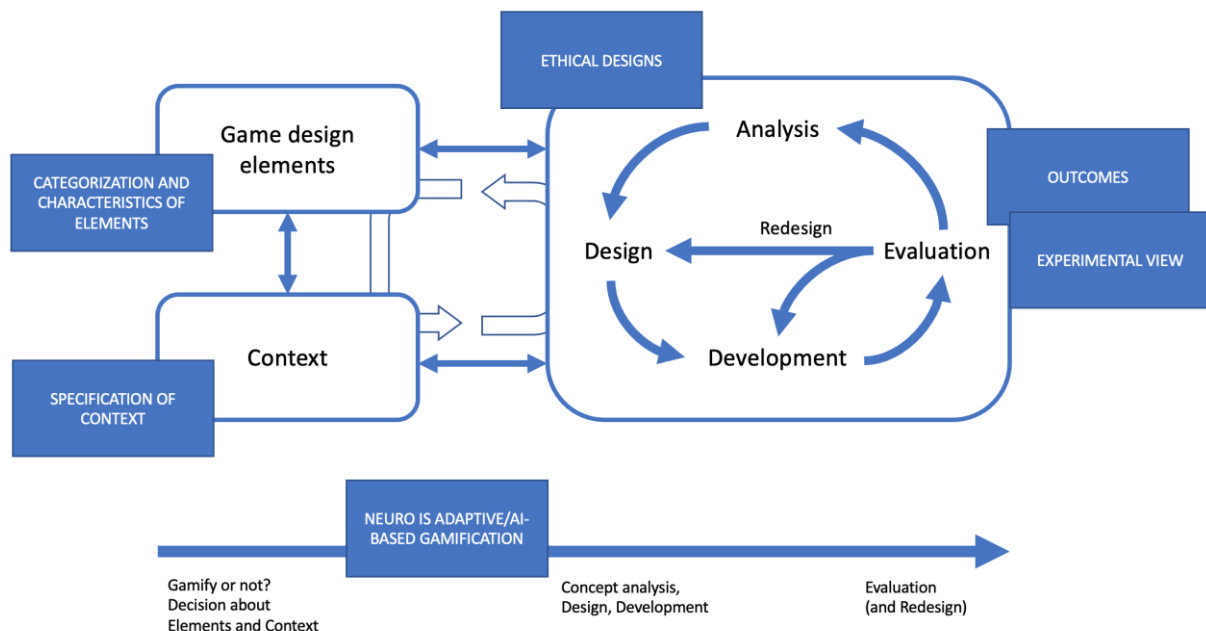
Gamification is cited as an effective approach of mediating individual and group behavior [Buckley et al., 2019] as well as an increasingly used method to improve user motivation and engage participants in a given activity [Morschheuser et al., 2017] but also increase service profitability and goal commitment [Hamari, 2017].

In the summary report on gamification designs at the 2019 European Conference on Information Systems in Sweden, Schöbel et al. [2020] provided an overview for researchers and practitioners to better understand what gamification is, why is it necessary, how it works in different contexts, and what should be the focus in future research projects and related efforts in order to fully utilize its potential. The authors proposed detailed research questions and important insights to understand the gamification concept in various scenarios, apply it to specific information systems, identify outcomes, and explore “new ways to gamify” as they have interestingly put. Provided research questions are categorized in seven different areas [Schöbel et al., 2020]:

- “Definition of gamification;
- Categorization of elements and meaning of gamification;
- Ethical designs;
- Outcomes;
- Experiments;
- Neuro IS;
- Adaptation/Adaptive/AI-based Gamification”.

These elements are conceptualized through a proposed model for developing gamification concepts.

Figure 1. Proposed process model for gamification concept development



Source: Adaptation based on Schöbel et al. [2020]

Gamification outcomes are most commonly related to various goals and effects [Schöbel et al., 2020], usually related to stimulation of a specific kind of positive end-user behavior such as improved student learning, health improvement, user-related behavioral changes as well as increased consumption, loyalty and product advocacy [Holfacker et al., 2016]. The approach of

using game-related elements in popular culture and society usually refers to modern digital technologies which are transformed and designed to influence “positive experiences, motivational enforcement and skill accruelement” [Schmidt-Kraepelin et al., 2020]. Robson et al. [2015] focused on the application of gamification principles in business-oriented activities and how it can stimulate new and innovative business practices. The authors suggested an MDE framework of three gamification principles: mechanics, dynamics, and emotions in order to create successful gamified experiences.

Implementation of gamification concept and related gamified elements may seem like a straightforward and easy process, but on the contrary – it is highly complex and extremely layered. Morschheuser et al. [2017] conducted series of in-depth interviews with gamification experts and created a summary of comprehensive requirements for gamification projects based on the gathered data:

- “Understand the user needs, motivation and behavior, as well as the characteristics of the context;
- Identify project objectives and define them clearly;
- Test gamification design ideas as early as possible;
- Follow an iterative design process;
- Profound knowledge in game design and human psychology;
- Assess if gamification is the right choice to achieve the objectives;
- Stakeholders and organizations must understand and support gamification;
- Focus on user needs during the ideation phase;
- Define and use metrics for the evaluation and monitoring of the success of a gamification approach;
- Control for cheating / gaming the system;
- Manage and monitor to continuously optimize the gamification design;
- Consider legal and ethical constraints in the design phase;
- Involve users in the ideation and design phase.”

Experts of various fields and businesses made some promising predictions on the gamification concept and its global utilization. On the other hand, many of the like also predicted that a lot of gamification-related efforts will fail due to a lack of understanding, predominantly related to how gamified elements should be designed and implemented [Morschheuser et al., 2017]. Furthermore, Landers [2018] argued about the existence of fake or rhetorical gamification, which is “a process which involves the decoration of existing (...) processes with game elements but with little or no attention paid to the psychological processes by which those elements influence human behavior”. The difference between fake and legitimate gamification should be precisely distinguished in order to unlock the true potential of gamification.

Many notable and interesting research papers of gamification concept utilization were observed in the field of marketing, education, healthcare, tourism, and several others which is highlighted below.

### **3. GAMIFICATION IN THE CONTEXT OF DIGITAL MARKETING AND RELATED FIELDS**

#### **3.1. MARKETING**

It should come as no surprise to explore the potential of gamification in the marketing arena as gamification's primary goals "perfectly align with core-marketing concepts" [Lucassen & Jansen, 2014]. Following the same idea, Al-Zyoud [2020] argued that marketing practices could be gamified in order to affect user behavior.

However, available academic papers and related research results which focus on the utilization of gamification in the digital marketing context are surprisingly scarce and relatively heterogeneous. There is a reasonable number of cited examples and professional evidence that support the idea of efficient use of gamification concept in various digital platforms and related to different (digital) marketing goals. Many prominent companies such as Amazon, LinkedIn, Tumblr and many others have adopted gamification principles and applied its concept as a marketing tool [Raj & Gupta, 2018; Leclercq, Poncin, & Hammedi, 2017; Deterding et al., 2011b; Zichermann & Linder, 2010]. This concept adaptation relates to the "use of game design elements by marketers for the specific purpose of increasing customer engagement and sales" [Raj & Gupta, 2018]. Furthermore, gamification has been used successfully in many digital platforms and internet-related businesses to improve user engagement [Domínguez et al., 2013], attract and retain customers.

Lucassen and Jansen [2014] conducted in-depth interviews with marketing executives of marketing and promotion agencies in order to explore their perception of gamification on several marketing-oriented levels. Research results indicated that the potential impact is indeed promising and suggested a rise in the adoption rate in the future. Another interesting research piece [Terlutter & Capella, 2014] explored gamified advertising within three game-related platforms: in-game advertising, advergames and advertising in social network games. Authors focused on game characteristics, psychological responses and behavior related to the game as well as the brand. Hofacker et al. [2016] explored the use of gamification on mobile platforms related to the improved effectiveness of marketing activities. In order to investigate the effect of gamification on mobile marketing outcomes, the authors suggested utilizing Schell's [2008] fundamental elements of game design: story, mechanics, aesthetics and technology. The authors continued to conclude that marketing practitioners should explore the possibilities of utilizing the gamification concept as it is likely to have an impact on customer experience. Dexter and Yazdanifard [2015] observed the use of gamification in the service industry related to customer acquisition and retention. Their results indicated a positive relationship between gamification strategies and customer acquisition and retention.

Hamari [2017] conducted an experiment by implementing a gamification element called 'badges' in a sharing economy service environment. The results showed that users who experienced gamification elements used the service in a more active way, compared with the users in a control group (activities such as "posting trade proposals, carrying out transactions and commenting on proposals").

Several studies explored the possibilities of gamification concept and gamified elements in social network sites and similar environments. Dexter and Yazdanifard [2015] argued that social networks can be used for engaging with users on an emotional level, especially in service industries. In a quite novel research approach, Thom et al. [2012] studied user activity patterns

in an enterprise-related social network service after the removal of gamified elements (points-based incentive system). Study results showed that the removal of the gamified elements did in fact reduce overall participation in the examined social network service.

Raj and Gupta [2018] studied consumer perception of gamification in marketing and the effect of gamified elements on brand loyalty. The authors argued that user engagement with gamification and gamified purchasing experiences positively affected both attitudes towards gamification as well as the impact of gamification on brand loyalty. The study results suggested that gamification concept can be a useful marketing tool if it is adapted and applied correctly. Al-Zyoud [2020] investigated the effect of gamification on consumer loyalty and consequently the effect of said loyalty on purchase and electronic word of mouth (eWOM) sharing activities. Based on study results, the author concluded that gamification is a predictor for enhanced consumer loyalty which influenced both purchase intention and eWOM sharing activities. In addition, customer loyalty mediated the connection between gamification and purchase intention as well as between gamification and eWOM sharing activities.

Sailer et al. [2017] studied different configurations of game design elements and analyzed their effect on the fulfillment of basic psychological needs. The experiment results suggested that specific game design elements can trigger various motivational outcomes and the effectiveness of the applied gamification concept depends on how well are those game design elements created. In other words, gamification is not necessarily successful just because it uses any game design element but only if its application is conducted properly. In addition, the application of gamified elements opens up many “interpretations and undetectable sources of bias or error” [Guin et al., 2012] as the process of successful gamification is quite complex. Or to put simply in the words of Guin et al. [2012]: “Some people like Monopoly, others like World of Warcraft, and some people would really just prefer to quietly read a book in the corner”.

An interesting research piece proposed the use of a tourism-related gamified app that would allow its users to locate restaurants based on the connection to cultural surroundings [Uribe et al., 2020]. Authors suggested that the gamified app creates new experiences from the specific micro-location of the restaurant which will boost the possibilities of cultural consumption. Guin et al. [2012] explored the respondent engagement in online surveys through an experiment with four specific survey presentation styles: “Text Only, Decoratively Visual, Functionally Visual and Gamified”. The experiment results suggested that there were no real differences in respondent engagement measures between the survey presentation styles, even though the Functionally Visual and Gamified options resulted in higher satisfaction scores from respondents.

### **3.2. EDUCATION**

Gamification can be leveraged in the education process to make learning more enjoyable and engaging for students, consequently improving the success of teaching, learning, and even research in higher education institutions [Ofosu-Ampong et al., 2020]. Based on a mapping study results of applied gamification in education, Dicheva et al. [2020] argued that the majority of the explored papers have reported promising outcomes. However, more empirical evidence is necessary to determine whether the “extrinsic and intrinsic motivation of the learners could be influenced by gamification”.

Ofosu-Ampong et al. [2020] argued that students’ intention to use gamification depends on performance expectancy, effort expectancy, attitude, social influence, and trust. Furthermore,

several “facilitating conditions” (prior exposure to computer games, accessibility and skills) had a positive effect on the intention to use gamification. Results of a study by Zamorano et al. [2021] suggested that creating a gameful experience leads to an active learning setup that supports student academic achievements. In addition, this scenario allows the development of specific student skills which are valuable for modern professionals.

In contrast with the studies which provided evidence for a positive impact of gamification on the learning process, several authors argued that some common beliefs about gamification in education could be, in fact, challenged. Domínguez et al. [2013] designed a gamification plugin for a well-known, university-based e-learning platform and tested student motivation and engagement. Students who participated in the gamified experience obtained higher scores in practical assignments and an overall score, but performed poorly on written assignments and participated less in-class activities. De-Marcos et al. [2014] conducted an empirical study and tested both gamification and social networking on e-learning, especially related to student academic achievement, participation and attitude. The results showed that both approaches had better performance than a traditional e-learning approach in terms of academic achievement for practical assignments, but the traditional e-learning approach obtained better results in assessing knowledge.

Another comparative study on 2 student courses explored the effect of gamification on “intrinsic motivation, social comparison, satisfaction, effort, and academic performance” [Hanus & Fox, 2015]. The results indicated that students in the gamified course had lower level of analyzed metrics (motivation, satisfaction, empowerment and final exam scores) in comparison with their counterparts in the control group with no gamified course elements. The authors noted that the reported effect was mediated by students' levels of intrinsic motivation.

### **3.3. HEALTH**

The gamification concept is being growingly utilized in the healthcare sector and is gaining popularity among, health professionals, academic researchers and providers of (digital) health services. Koivisto and Hamari [2014] explored user demographic differences in perceived benefits from gamification in the context of an exercise service application. Findings indicated that perceived enjoyment and usefulness of the gamification decline with its use, women reported greater social benefits from its use and ease of use was reported to decline with age.

Schmidt-Kraepelin et al. [2020] analyzed available health mobile apps in order to determine to what extent have applied gamification elements affected desired health-related outcomes. The study results indicated the existence of 8 archetypes of gamification approaches [Schmidt-Kraepelin et al., 2020]:

- “physical activity through competition and collaboration;
- pursuing self-set fitness goals without rewards;
- episodic compliance tracking;
- inherent gamification for external goals;
- self-set goals for mental well-being;
- continuous assistance through positive reinforcement;
- medical exam preparation without rewards; and
- learning through progressive gamification.”

The authors found a close relationship between the gamification archetypes and the desired health-related outcomes.

Another study with a focus on health-related mobile apps explored specifically gamification elements of diabetes apps [Alluhaidan & Alluhaidan, 2015]. The authors provided a detailed description of the current design and evaluation of selected apps as well as recommendations on what similar apps should focus on in the future.

#### **4. CONCLUSION**

This paper provides an overview of available pertinent research efforts and related studies that capture the currently observed potential of gamification as a concept and as a tool. The research overview illustrates the main areas of gamification utilization and its use efficiency in various settings and scenarios. The concept of gamification is clearly gaining focus, even though it can be observed that the terminology is used and applied inconsistently. Many researchers and supporting studies, such as Schmidt-Kraepelin et al. [2020], underline the fact that research on effective gamification is still in its infancy and that “methodological shortcomings of existing studies” should be recognized and explored.

In addition, the paper aims to lay a foundation for comprehensive future research activities that will hopefully inspire researchers and professionals to create and conduct future gamification research studies. The implications of these findings are valuable as the explored gamification mechanisms have virtually limitless fields of application but are still unjustifiably and insufficiently researched.

This research overview is clearly limited to the attainable literature on the topic in focus and additional research efforts are of utmost importance, especially those related to the effectiveness of the gamification concept. Both marketing academic researchers and practitioners should test the efficiency of the gamification concept but only utilizing proper and well-designed gamification tactics and gamified elements.

Due to the complexity and the multidisciplinary nature of the subject, it is expected that novel insights from the researched effort will arrive and guide the “development of innovative and more effective gamification approaches” [Schmidt-Kraepelin et al., 2020], especially related to the measurement of gamification effectiveness. Future research of gamification concept and related efforts should focus on specific elements of gamification rather than on gamification as an “overarching concept” [Hanus & Fox, 2015] in order to determine the objective effects of its application and to allow direct comparability.

#### **REFERENCES**

1. Al-Zyoud, M. F. (2020). The impact of gamification on consumer loyalty, electronic word-of mouth sharing and purchase behavior. *Journal of Public Affairs*, e2263.
2. Alluhaidan, M. S., & Alluhaidan, A. S. (2015). Gamification Elements in Diabetes mHealth Apps: Analysis And Recommendation. In *IADIS International Conference Information Systems Post-Implementation and Change Management 2015*. 18-26.
3. Ašeriškis, D., & Damaševičius, R. (2014). Gamification patterns for gamification applications. *Procedia Computer Science*, 39, 83-90.
4. Buckley, P., Noonan, S., Geary, C., Mackessy, T., & Nagle, E. (2019). An empirical study of gamification frameworks. *Journal of Organizational and End User Computing (JOEUC)*, 31(1), 22-38.



5. De-Marcos, L., Domínguez, A., Saenz-de-Navarrete, J., & Pagés, C. (2014). An empirical study comparing gamification and social networking on e-learning. *Computers & education*, 75, 82-91.
6. Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011a). From game design elements to gamefulness: defining "gamification". In *Proceedings of the 15th international academic MindTrek conference: Envisioning future media environments*, 9-15.
7. Deterding, S., Sicart, M., Nacke, L., O'Hara, K., & Dixon, D. (2011b). Gamification. using game-design elements in non-gaming contexts. In *CHI'11 extended abstracts on human factors in computing systems*. 2425-2428.
8. Dexter, J. B., & Yazdanifard, R. (2015). Applying Gamification To the Service Industry As an Effective Way of Gaining and Retaining Customers. Available at: [https://d1wqtxts1xzle7.cloudfront.net/34259809/Applying\\_gamification\\_to\\_the\\_service\\_industry\\_as\\_an\\_effective\\_way\\_of\\_gaining\\_and\\_retaining\\_customers-with-cover-page-v2.pdf](https://d1wqtxts1xzle7.cloudfront.net/34259809/Applying_gamification_to_the_service_industry_as_an_effective_way_of_gaining_and_retaining_customers-with-cover-page-v2.pdf). (15.08.2021.)
9. Dicheva, D., Dichev, C., Agre, G., & Angelova, G. (2015). Gamification in education: A systematic mapping study. *Journal of Educational Technology & Society*, 18(3), 75-88.
10. Domínguez, A., Saenz-de-Navarrete, J., De-Marcos, L., Fernández-Sanz, L., Pagés, C., & Martínez-Herráiz, J. J. (2013). Gamifying learning experiences: Practical implications and outcomes. *Computers & education*, 63, 380-392.
11. Guin, T. D. L., Baker, R., Mechling, J., & Ruyle, E. (2012). Myths and realities of respondent engagement in online surveys. *International Journal of Market Research*, 54(5), 613-633.
12. Hamari, J. (2017). Do badges increase user activity? A field experiment on the effects of gamification. *Computers in human behavior*, 71, 469-478.
13. Hamari, J., Koivisto, J., & Sarsa, H. (2014). Does gamification work? A literature review of empirical studies on gamification. In *Proceedings of the Hawaii International Conference on System Science*, 3025-3034.
14. Hanus, M. D., & Fox, J. (2015). Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance. *Computers & education*, 80, 152-161.
15. Hofacker, C. F., De Ruyter, K., Lurie, N. H., Manchanda, P., & Donaldson, J. (2016). Gamification and mobile marketing effectiveness. *Journal of Interactive Marketing*, 34, 25-36.
16. Huotari, K., & Hamari, J. (2017). A definition for gamification: anchoring gamification in the service marketing literature. *Electronic Markets*, 27(1), 21-31.
17. Landers, R. N. (2019). Gamification misunderstood: How badly executed and rhetorical gamification obscures its transformative potential. *Journal of Management inquiry*, 28(2), 137-140.
18. Leclercq, T., Poncin, I., & Hammedi, W. (2017). The engagement process during value co creation: Gamification in new product-development platforms. *International Journal of Electronic Commerce*, 21(4), 454-488.
19. Lucassen, G., & Jansen, S. (2014). Gamification in consumer marketing-future or fallacy?. *Procedia-Social and Behavioral Sciences*, 148, 194-202.
20. Morschheuser, B., Hamari, J., Werder, K., & Abe, J. (2017). How to gamify? A method for designing gamification. In *Proceedings of the 50th Hawaii International Conference on System Sciences 2017*. University of Hawai'i at Manoa.
21. Ofosu-Ampong, K., Boateng, R., Anning-Dorson, T., & Kolog, E. A. (2020). Are we ready for Gamification? An exploratory analysis in a developing country. *Education and Information Technologies*, 25(3), 1723-1742.

22. Plass, J. L., Homer, B. D., & Kinzer, C. K. (2015). Foundations of game-based learning. *Educational Psychologist*, 50(4), 258-283.
23. Raj, B., & Gupta, D. (2018). Factors Influencing Consumer Responses to Marketing Gamification. In *2018 International Conference on Advances in Computing, Communications and Informatics (ICACCI)*. 1538-1542.
24. Robson, K., Plangger, K., Kietzmann, J. H., McCarthy, I., & Pitt, L. (2015). Is it all a game? Understanding the principles of gamification. *Business horizons*, 58(4), 411-420.
25. Sailer, M., Hense, J. U., Mayr, S. K., & Mandl, H. (2017). How gamification motivates: An experimental study of the effects of specific game design elements on psychological need satisfaction. *Computers in Human Behavior*, 69, 371-380.
26. Schell, J. (2008). *The Art of Game Design: A book of lenses*. CRC press.
27. Schmidt-Kraepelin, M., Toussaint, P. A., Thiebes, S., Hamari, J., & Sunyaev, A. (2020). Archetypes of Gamification: Analysis of mHealth apps. *JMIR mHealth and uHealth*, 8(10), e19280.
28. Schöbel, S., Janson, A., Jahn, K., Kordyaka, B., Turetken, O., Djafarova, N., Saqr, M., Wu, D., Söllner, M., Adam, M., Gad, P. H., Wesseloh, H., & Leimeister, J. M. (2020). A Research Agenda for the Why, What, and How of Gamification Designs: Outcomes of an ECIS 2019 Panel. *Communications of the Association for Information Systems*, 46. <https://doi.org/10.17705/1CAIS.04630>
29. Seaborn, K., & Fels, D. I. (2015). Gamification in theory and action: A survey. *International Journal of human-computer studies*, 74, 14-31.
30. Statista (2021). Global video game market value from 2020 to 2025. Available at: <https://www.statista.com/statistics/292056/video-game-market-value-worldwide/> (15.08.2021.)
31. Terlutter, R., & Capella, M. L. (2013). The gamification of advertising: analysis and research directions of in-game advertising, advergames, and advertising in social network games. *Journal of advertising*, 42(2-3), 95-112.
32. Thom, J., Millen, D., & DiMicco, J. (2012). Removing gamification from an enterprise SNS. In *Proceedings of the acm 2012 conference on computer supported cooperative work*. 1067-1070.
33. Uribe, S. A. N., Rincón, A. A. A., Castillo, C. A. R., Valencia, M., Lozano, H. D. & Guzmán, C. (2020). Project for the Innovation in the Gastronomic Market of Bogota Through the Design of a Gamification Experience for Mobile Devices. In *Proceedings of the International Conference of Applied Business and Management (ICABM2020)*. 246-275.
34. Zamorano, L. R. M., Sánchez, J. Á. L., Caballero, A. L. G., & Muñoz, C. B. (2021). Gamification and active learning in higher education: is it possible to match digital society, academia and students' interests?. *International Journal of Educational Technology in Higher Education*, (18), 13.
35. Zichermann, G., & Linder, J. (2010). *Game-based marketing: inspire customer loyalty through rewards, challenges, and contests*. John Wiley & Sons.