
# Gaming in Action

Edited by
**José Alberto Lencastre**
University of Minho, Portugal
**Paulina Spânu**
Politehnica University of Bucharest, Romania
**Gülden İlin**
Çukurova University, Turkey
**Panos Milios**
DIAN, Greece
**Marco Bento**
Polytechnic of Coimbra, Portugal

Erasmus+


# Gaming in Action

Edited by

**José Alberto Lencastre**
University of Minho, Portugal

**Paulina Spânu**
Politehnica University of Bucharest, Romania

**Gülden İlin**
Çukurova University, Turkey

**Panos Milios**
DIAN, Greece

**Marco Bento**
Polytechnic of Coimbra, Portugal

Published by Mesleki Girişimciler ve Toplum Gönüllüleri Derneği
(Tarsus / Mersin, Turkey).

Layout production by Searchlighter Services Ltd, Bristol, UK.



First Published in 2021

ISBN : 978-605-70651-0-0

Printed in Istanbul, Turkey at

özkaracan 1965

Öz Karacan Printers and Binders,
Güneşli, Bağcılar,İstanbul

The *Gaming in Action – engaging adult learners with games and gamification* Strategic Partnership project has been funded with support from the European Commission. The content of this publication reflects the views only of the authors and editors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

# Starting the Game: an introduction to Gamification

*José Alberto LENCASTRE & Marco BENTO*
*University of Minho, Portugal*
*(CIED – Research Centre on Education)*

*Gülden İLİN*
*Çukurova University, Turkey*

*Panos MILIOS*
*DIAN, Greece*

## Introduction

There are references to 'gamification' as early as 1980, when Professor Richard Bartle of the University of Essex, a pioneer in multiplayer online games, says that the term initially referred to as "turning something not a game into a game" (Werbach & Hunter, p. 25).

The first use of gamification in its current sense occurred in 2002 when Nick Pelling referred to the use of game elements in non-game situations while creating game-like interfaces for electronic devices (Domínguez, et al., 2013). The term has fallen out of favour, although during subsequent years, researchers such as James Paul Gee (2003; 2013) began to talk about the potential of video games. However, it was only in 2010 that the term gamification became widely adopted in the sense that we use it nowadays.

Gamification is an intricate word, and game developers and researchers are concerned that this trivializes practical game design complexities. The difficulty is that there is no universally accepted definition of gamification; on the contrary, there are several definitions for the concept. Even after being called "the new trend concept" (King, 2019), the use of the term 'gamification' is often confusing and

misinterpreted. It is easily confused with concepts like game-based learning, gaming, serious games and game theory.

Deterding et al. (2011) explain that "gamification is an informal umbrella term for the use of video game elements in non-game systems to improve the individual's experience and involvement" (p. 2425). Knaving and Björk describe gamification as a way of enriching involvement in activities that lack intrinsic motivation (Knaving & Björk, 2013). For Zichermann and Cunningham (2011), gamification is defined as the use of game mechanics and thinking to solve problems and interact in contexts not related to games. In a similar vein, Werbach and Hunter (2012) explain the concept as "the use of game elements and game-design techniques in non-game contexts" (p. 26).

For this text's purposes, the last definition is the one that works, and we will explain it in detail.

## Game Elements

A game is itself an integrated experience built from many smaller pieces: the elements. So, the elements are a toolkit for creating a game, and obviously we can make a game with game elements. Or we can assemble the elements into something that is not a game. When we take game pieces and incorporate them into research practices, we are in gamification, and the final product is, hopefully, a better and more engaging thing (Lee & Hammer, 2011).

Game elements are described in different ways in the literature. Anderson (2011) places game elements in a model with play as a central component. He argues that what turns a play into a game is the introduction of challenges. The choices involve these challenges that players face. As players go through the experience, the feedback will show their progress. These feedback loops can be extrinsic motivators, such as goals, rewards, badges. Game elements can be considered as a part that make up the whole game, and gamification consists of using these elements in a situation. Gamification uses many different elements of games, some are easy to put into practice, and others are less

straightforward and need more design to be adopted. It all depends on the context in which these elements will be used. Currently, gamification's most popular elements are avatars, points, badges, leader boards, rewards, rankings, levels, challenges, rules, time, teams, goals, competition, cooperation, and feedback (Deterding et al., 2011).

We must not forget that gamification is not about building a game. It is just a matter of using some game elements and, since it operates at the element level, the use of gamification offers more flexibility than the use of a game. With gamification, breaking the rules is what we should be doing. As a gamified system designer, we can adjust the elements to make the experience more engaging or achieve specific goals. The central point is that the game elements can be incorporated into activities that are not games.

According to Werbach and Hunter (2012, pp. 78-83), the game elements are divided into three categories: dynamics, mechanics and components. Adding these three parts together will increase the engagement appeal to the user. These three categories are interconnected; however, all of these parts do not always need to be implemented. And even in each category, not all elements will be used together.

Werbach and Hunter (2012) explain that the dynamics are considered "behind the scenes" of gamification. It states what the game is, describes how gamification will be motivational and fun. Altarriba describes it as "the grammar of a game" (2014). Also, mechanics is the part that helps in the action of the game and gets the user involved. These mechanics connect to the dynamics and helps to accomplish it.

Besides, Werbach and Hunter (2012) describe components as the delicate parts that connect with mechanics or dynamics. They are used to attract users and keep them engaged. Most of them will have a direct connection with the user.

Each category is listed in Table 1.

**Table 1- Dynamics, mechanics and components (Werbach & Hunter, 2012)**

| Game Mechanics | Game Components | Game Dynamics |
|---|---|---|
| Challenges | Achievements | Narrative |
| Chance | Avatars | Emotion |
| Competition | Badges | Emotions |
| Cooperation | Boss Fights | Progression |
| Feedback | Collections | Relationship |
| Resource | Combat | |
| Rewards | Content Unlocking | |
| Transactions | Gifting | |
| Turns | Leader boards | |
| Win States | Levels | |
| | Points | |
| | Quests | |
| | Social Graphs | |
| | Teams | |
| | Virtual Goods | |

The components mentioned above are the elements commonly used in gamification, but there are other elements in games. Any element of the game has the potential to be integrated, depending on the context. Elements such as badges, points, levels and leader boards are considered to be in common use. They quickly impact users' behaviour, even if slightly (Hamari et al., 2014).

## Game-Design Techniques

Gamification also involves the use of game-design techniques. It is easy to accept that it is not a big challenge to get an element of the game, such as a points system and a leader board. However, to approach gamification in this way, we have to know the goal of earning points. Some learners may find it interesting to accumulate a score or reach the top of the leader board. But it can only happen for a while, and these learners can get tired

of just earning points. Other users may get discouraged when they see the top of the leader board very far away.

Deciding which elements of the game to place and how to make the overall gamified experience more significant than the sum of those parts is where game-design techniques have their role. The aspects of the games that make them fun, addictive and challenging cannot be reduced to a list of elements or step-by-step instructions. Game design is laborious, and this is the stage where everything can fail (Kingley & Grabner-Hagen, 2015).

## Non-Game Contexts

The last aspect of our chosen definition is that gamification operates in non-game contexts. This means that the learners are not playing a concrete game; that is, they are not invading a castle, driving a car on a racetrack or cutting fruits while escaping from enemies, but exploring content to solve a teacher's task. They are not killing dragons or collecting sweets, but they are collecting achievements along the way to improve their score on a subject. It is essential to keep this in mind when designing a gamified practice. Our learners are not there to escape from a problematic situation into a fantasy world; they are there to engage more deeply with content, with colleagues, with the subject. However, if the narrative is somehow consistent (Lencastre et al., 2016), it may still seem like a game.

Therefore, the challenge of gamification is to take the elements that generally operate in the game universe and apply them effectively in class. In several situations, teachers discover that gamification turns a tedious but valuable task into an exciting challenge, even producing measurable results. Learners can visually track their progress, compare themselves with colleagues, receive incentives and challenge each other to go further or faster. A good narrative improves the learning experience (Lencastre et al., 2016), and ties each learner in an integrated environment that makes them want more when each challenge is over.

Gamification in education takes the components and characteristics of the game and applies them to a pedagogical situation.

The final output is not a game but a game situation with pedagogical purpose. If gamification is removed from the pedagogical situation, it may still work, but it is not the same situation, with the motivation and involvement that gamification gives. The motivation in gamification is an argument noted in some empirical studies (De Freitas & Oliver, 2006; Linehan et al., 2011). However, we also believe that gamification brings more than just motivation; it requires engagement, relationship and responsibility.

Finally, we want to answer a question that we are often asked when we talk enthusiastically about gamification: why should a game-based practice be taken seriously in education? Perhaps the notion of applying something as fun as a game to something as dull as schoolwork is inherently attractive, or maybe we believe that it can be a stimulating form of advocacy for gamification.

Anyway, we see four particularly compelling reasons why all teachers and trainers should at least consider gamification: (i) Motivation, (ii) Engagement, (iii) Results, and (iv) Research.

### *(i) Motivation*

We are constantly talking that schools do not keep up with what is happening outside them. Who is not prepared for today's learners, digitally insatiable. We think of gamification as a means of designing narratives, that motivate learners to do things. When we prepare a narrative, we want to strengthen our learners' relationship and employ them with the subject's objectives and content, always thinking that this will be good for them.

### *(ii) Engagement*

When we talk about gamification, we say that it has everything to do with learner engagement. The exact human needs that drive engagement with games are present at school or university. According to Werbach and Hunter (2012), the reason for this is that our brains are programmed to crave puzzle-solving, feedback and reinforcement, and many other

experiences that games provide. The authors state that "study after study showed that games activate the brain's dopamine system, which is associated with pleasure, and neuroscientists have also found parallels between the brain's response to games and the engagement process (Werbach & Hunter, 2012, p. 31). Thus, it seems to us that it makes sense to take advantage of the natural emotion that motivates learning and higher engagement levels.

### *(iii) Results*

Another aspect that has interested us so far in gamification is that it really works. Despite the novelty of the practice, the fact is that we have obtained significant positive results with the incorporation of game elements in our teaching and learning processes.

### *(iv) Research*

There is one last reason why we are interested in gamification is to open up the space for research. Like in games, if the game is effective and not too tricky, players will be continually motivated to strive for improvement. And they are encouraged to try new and different approaches to find better solutions. This spirit of constant innovation is ideally suited to today's rapidly changing school or university environment.

## The Narrative

Last but not the least: the narrative (Lencastre et al., 2016). In games, to keep the player interested in the gameplay, they add a narrative to it; games are usually built on a narrative. In the same vein, having a narrative in gamification is a fundamental element, making it exciting and giving meaning to the whole process. The narrative can shape the gamified experience and motivate the learner's involvement; also, can provide a robust set of challenges that are meaningful and intrinsically engaging. The narrative makes each content, each task, each result fit and flow towards the final goal. Therefore, the narrative must be thought and designed very carefully.

McGonigal (2011) argues that a good gamification system presents within a story with a broad objective, and that the players look and feel positive about their own abilities, surpassing them. To paraphrase the author, we say that a sound gamification system in education presents itself within a well-designed narrative with a broad but clear objective. Learners look and feel optimistic about their abilities, continually getting more engaged.

## Final remarks

Gamification is synonymous with learning and understanding. It is the act of solving problems that makes the school fun and gamified as well. Education is an area with a high potential for gamification, as it aims to promote motivation and learner involvement. Gamification can involve the teacher gamifying an activity or teaching a concept by including a narrative and components such as missions, milestones, points, levels and feedback, increasing learner involvement, collaboratively, without being linked to any game. Therefore, learners learn, not playing specific games, but learning the content as if they were playing a game, making the educational experience challenging and fun.

Thus, gamification offers the opportunity to combine 21st-century content, teaching, and learning skills in a surrounding learning environment. The educator will provide specific content with a gamification process adapted to the learning context and learners' profiles. Intuitively, gamification has excellent potential to motivate learners and make the school or university more attractive.

## References

Altarriba, F. (2014). The Revolution of Fun. Available at: http://www.ferranaltarriba.com/docs/therevolutionoffun.pdf

Anderson, S. P. (2011). *Seductive interaction design: creating playful, fun, and effective user experiences*. Berkeley: New Riders.

Chang, K.-E., Wu, L.-J., Weng, S.-E., & Sung, Y.-T. ( 2012 ). Embedding game-based problem- solving phase into problemposing system for mathematics learning. *Computers & Education*, 58 (2), 775 – 786 . doi: 10.1016/j.compedu.2011.10.002

De Freitas, S. & Oliver, M. (2006). How can exploratory learning with games and simulations within the curriculum be most effectively evaluated? *Computers and Education Special Issue on Gaming*, 46(2006), 249–264.

Deterding, S., Sicart, M., Nacke, L., O'Hara, K. & Dixon, D. (2011). Gamification: Using Game Design Elements in Non-Gaming Contexts. *CHI 2011: Conference on Human Factors in Computing Systems*, 5–8.

Domínguez, A., Saenz-de-Navarrete, J., De-Marcos, L., Fernández-Sanz, L., Pagés, C., & Martínez-Herráiz, J. (2013). Gamifying learning experiences: Practical implications and outcomes. *Computers & Education*, 63, 380–392.

Gee, J. P. (2003). *What video games have to teach US about learning and literacy*. Palgrave Macmillan.

Gee, J. P. (2013). *Good Video Games and Good Learning*. New York: Peter Lang.

Hamari, J., Koivisto, J., & Sarsa, H. (2014, 6-9 Jan. 2014). *Does Gamification Work? -- A Literature Review of Empirical Studies on Gamification.* Paper presented at the System Sciences (HICSS), 2014 47th Hawaii International Conference on.

King, N (2019). *6 Gamification Trends that will Transform Training in 2020 & Beyond* https://medium.com/@nicoking/6-gamification-trends-that-will-transform-training-in-2020-beyond-d0d7f044a29c

Kingsley, T., & Grabner-Hagen, M. (2015). Gamification: questing to integrate content knowledge, literacy, and 21st-century learning, *Journal of Adolescent & Adult Literacy,* 59(1), 51–61.

Knaving, K., & Björk, S. (2013). *Designing for Fun and Play: Exploring possibilities in design for gamification.* Paper presented at the Proceedings of the First International Conference on Gameful Design, Research, and Applications.

Koster, R. (2005). *A Theory of Fun for Game Design.* Scottsdale, AZ: Paraglyph Press.

Lee, J., & Hammer, J. (2011). Gamification in education: What, how, why bother? *Academic Exchange Quarterly*, 15(2), 1-5.

Lencastre, J. A., Bento, M., & Magalhães, C. (2016). MOBILE LEARNING: potencial de inovação pedagógica. In Tânia Maria Hetkowski & Maria Altina Ramos (orgs.), *Tecnologias e processos inovadores na educação* (pp. 159-176). Curitiba: Editora CRV.

Linehan, C., Kirman, B., Lawson, S., & Chan, G. (2011). Pratical, appropriate, empirically-validated guidelines for designing educational games. In *Proceedings of CHI '11*.

McGonigal, J. (2011). *Reality is broken: Why games make us better and how they can change the world*: Penguin.

Silva, B., Lencastre, J. A., Bento, M., & Osório, A. J. (2019). State of the art of each partner country on experiences in game-based learning and gamification. In Bento Duarte da Silva, José Alberto Lencastre, Marco Bento & António J. Osório (ed), *Experiences and perceptions of pedagogical practices with game-based learning & gamification* (pp. 13-32). Braga: Research Centre on Education (CIEd), Institute of Education, University of Minho.

Werbach, K., & Hunter, D. (2012). *For the win: How game thinking can revolutionize your business*: Wharton Digital Press.

Zichermann, G., & Cunningham, C. (2011). *Gamification by design: implementing game mechanics in web and mobile apps*. Sebastopol, CA: O'Reilly.