ISCTE Business School
Instituto Universitário de Lisboa

THE GAMIFICATION FEATURES' EFFECT ON THE TRAINING EFFECTIVENESS IN ORGANIZATIONAL CONTEXT

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ABSTRACT

The learning approach and trainees' expectations change throughout time due to generational characteristics, furthering the need to innovate new ways to train employees within organizations. Taking advantage of the technological development and digital orientation of the current workforce, gamification has proven to be an effective approach to learning purposes. This method incorporates game design elements into non-game environments, such as learning scenarios, aiming to improve motivational levels and, therefore, promote training effectiveness.

The present research aims to study user experience satisfaction and how could it impact training effectiveness. Furthermore, training motivation is analyzed as a mediator on this relation, as well as work engagement and open-mindedness in moderation roles.

A sample of 128 respondents allowed researchers to understand the strong correlation between gamification, measured through the user experience satisfaction, and training effectiveness. Additionally, the research showed that training motivation is crucial in making the first relationship happen. Moreover, work engagement and open-mindedness do not seem to have significant influence as moderators in the relationship described.

To build up gamified application for training, many variables should be taken into consideration when choosing the right gamification elements to include. These variables include concepts such as participants' needs in regards to course content and training purpose. Additionally, these processes require organizations to be aware of the Human Resources policies and practices that should be adjusted to improve training and development methodologies.

Keywords: gamification, training and development, training motivation, training effectiveness.

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M53 Personnel Economics: Training;

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RESUMO

A abordagem de aprendizagem e as expectativas dos formandos têm vindo a alterar-se ao longo do tempo, devido às características geracionais, trazendo a necessidade de encontrar novas abordagens para formar os colaboradores nas organizações. Beneficiando do desenvolvimento tecnológico e da orientação para o digital, a gamificação tem vindo a dar provas de ser uma abordagem eficaz para fins de aprendizagem. Esta metodologia incorpora elementos de *design* de jogo em ambientes de não jogo, como contextos de aprendizagem, com o objetivo de melhorar os níveis de motivação e, consequentemente, promover formações eficazes.

Este estudo pretende analisar a *user experience satisfaction* e qual o seu impacto na *training effectiveness*. Posteriormente, a *training motivation* é analisada enquanto mediadora desta relação, sendo o *work engagement* e a *open-mindedness* estudados como moderadores.

Uma amostra de 128 inquiridos permitiu perceber a forte correlação entre a gamificação, medida através da *user experience satisfaction*, e a *training effectiveness*. Para além disso, o estudo mostra que a *training motivation* é crucial para permitir a primeira relação. Adicionalmente, o *work engagement* e a *open-mindedness* parecem não ter uma influência significativa enquanto moderadoras da relação descrita anteriormente.

De forma a implementar aplicações gamificadas, diversos fatores devem ser considerados ao selecionar os elementos de jogo certos a incluir, como as necessidades dos participantes no que diz respeito ao conteúdo e ao propósito da formação. Posteriormente, estes processos requerem a consciência das organizações acerca das políticas e práticas de Recursos Humanos que devem ser adaptadas para melhorar as metodologias de formação e desenvolvimento.

Palavras-chave: gamificação, formação e desenvolvimento, training motivation, training effectiveness.

Códigos do Sistema de Classificação JEL:

M53 Personnel Economics: Training;

Y40 Dissertations (unclassified).

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LIST OF ABBREVIATIONS

CEO – Chief Executive Officer

CHRO – Chief Human Resources Officer

HR – Human Resources

OM – Open-mindedness

SDT – Self-Determination Theory

TEF – Training effectiveness for gamified trainings

TEFa – Training effectiveness for non-gamified trainings

TM – Training motivation

USE – User experience satisfaction

UX – User Experience

WE – Work engagement

INTRODUCTION

The learning approach has developed throughout history and the traditional teaching models seem to no longer be effective. There has been a shift in the context in which learners have an active role in their motivational levels and "learning by doing" methods are becoming the standard (Garris, Ahlers, & Driskell, 2002; Stone, Deadrick, Lukaszewski, & Johnson, 2015).

Some authors talked about contemporary learners because they believe that the current generation is different from previous ones due to digital technology proliferation (Garris et al., 2002; Prensky, 2003; Savignac, 2017). Modern individuals appear to require different motivational techniques in order to find interest in learning about specific subjects. According to the Education Director at Microsoft, one of the early adopter companies of gamification, present day learners also need new instructional approaches as opposed to conventional ones (Armstrong & Landers, 2018; Dichev & Dicheva, 2017; Prensky, 2003).

Looking at the business world, training and development has become one of the most important Human Resource processes for organizations due to their potential to enhance skills and competencies and, furthermore, to create competitiveness in the labor market (Armstrong & Landers, 2018; Blume, Ford, Baldwin, & Huang, 2010; Mielniczuk & Laguna, 2017). To ensure effective knowledge transmission, many approaches are becoming a popular substitute to conformist ways since investment in training is expected to bring valuable return for the employees (Blume et al., 2010; Mielniczuk & Laguna, 2017; Prensky, 2003). Gamification is one of the most recently studied and applied approaches (Armstrong & Landers, 2018) because it appears to be a functional resource to enhance business activities. This is based on the fact that game features are enjoyable, bringing motivation and engagement for the participants (Dichev & Dicheva, 2017; Kapp, 2012; Mielniczuk & Laguna, 2017).

Some larger multinational companies like Nike, Microsoft and Vodafone have improved both their employee and customer experience through gamified applications (Gupta & Gomathi, 2017). Gamification applications have been recognized as valuable tools for these fields, as well as for other organizational activities such as recruitment, training, performance evaluation and customer satisfaction (Gupta & Gomathi, 2017; Mielniczuk & Laguna, 2017; Savignac, 2017).

Furthermore, during the Society for Human Resource Management Conference, gamification was recognized as one of the top technological approaches in the Human Resource field (Gupta & Gomathi, 2017).

Organizations have considered utilizing gamification throughout the past few years. In 2015, 40% of the 1,000 biggest organizations were inquiring about making improvements to their business practices through the use of gamification (Armstrong & Landers, 2018; Gupta & Gomathi, 2017). Advancements such as gamification also catch the attention of potential employees because people desire to work for companies that use modern technology to increase productivity (Gupta & Gomathi, 2017; Kapp, 2012).

The concept that games are an effective tool and appealing educational tool is not new and, during the 1970s, a study was conducted based on 22 simulation-based training games (Garris et al., 2002; Sailer, Hense, Mayr, & Mandl, 2017). During the study only 3 of the selected gamified trainings appeared to be more effective than conventional teaching methods. However, studies conducted in the 1990s showed a tendency to favor gamified learning methodologies to traditional ones (Garris et al., 2002). These studies have influenced game based training to gain popularity in recent years because of their proven positive impact on employees (Armstrong & Landers, 2018; Çeker & Özdamli, 2017; Sailer et al., 2017).

A participant's interest in a subject can be enhanced by the game features because they trigger the users' senses in an effort to influence their behavior, thus more positive outcomes can be reached (Faiella & Ricciardi, 2015; Garris et al., 2002; Landers, 2014). Games are designed to influence repetitive use and this behavior is intended to be transferred to the instructional applications (Armstrong & Landers, 2017; Garris et al., 2002).

Gamification has been established as an effective tool in creating a bridge between learners and trainers, which typically experience a divide due to differences, such as a generational gap (Faiella & Ricciardi, 2015; Gupta & Gomathi, 2017). More recently, Gamification has been proven to possess the potential to motivate learners, change behaviors and promote collaborative environments, although the practical usage has dominated the theoretical understandings (Dichev & Dicheva, 2017; Gupta & Gomathi, 2017). This means that there is not enough information on the long-term benefits of adopting gamified processes for educational affairs when compared to more conventional methods (Dichev & Dicheva, 2017; Sailer et al., 2017).

Therefore, according to the authors, it is of high importance to keep investigating the topic and its relationship with other factors, such as motivation, engagement and learning outcomes, that can influence the gamification usage for instructional purposes (Çeker & Özdamli, 2017; Dichev & Dicheva, 2017; Sailer et al., 2017).

Since traditional methodologies do not always provide the best outcomes for training, new paths need to be explored, and gamification seems to have the potential to be a powerful candidate. Because of the inconclusive research and the lack of strong evidence to prove gamification's value, the present study aims to add insight to existing literature. This dissertation will highlight training effectiveness and how can gamification elements (such as points, badges and levels) have a positive impact on the outcomes of some training programs. Furthermore, the training motivation will be analyzed in order to see its relevance to training effectiveness. Finally, the work engagement and open-mindedness will be evaluated as corporate and personality-related variables, respectively, and how can they separately influence the relationships described above.

CHAPTER I – LITERATURE REVIEW

1. Training effectiveness - the importance of having effective training practices

Within the Human Resources field, training has become a priority in both individual and organizational level (Faiella & Ricciardi, 2015; Mielniczuk & Laguna, 2017). In fact, it has been shown that the knowledge acquired in the formal education is not enough for the needs that organizations require from their workforce nowadays (Mielniczuk & Laguna, 2017).

Organizations need to give attention to this HR process, since it has a critical role in retaining qualified professionals in the companies, by creating value in two directions – individuals acquiring more competencies and organizations adding value to themselves (Bartolomeo, Stahl, & Elias, 2015; Huang & Su, 2016). Although, the training outcomes will always depend on the employees' desires, expectations and motivation toward the training, recognizing it as useful for their skills acquisition and improvement (Mielniczuk & Laguna, 2017). To reach the most desirable outcomes, it is important to evaluate how much effective was the learning event in order to see if is worth it to continue, how can it be improved and why does it in fact exists (Kirkpatrick & Kirkpatrick, 2013, 2009)

To evaluate how effective was a training program, Kirkpatrick & Kirkpatrick (2013) have proposed four levels of analysis – reaction, learning, behavior and results. The reaction level corresponds to the participants' responses about the learning event and how they felt about it and, as the second level, learning brings the importance of knowledge and skills acquisition that were allowed with the participation in the training (Kirkpatrick & Kirkpatrick, 2013, 2009). Moreover, the authors find significant to evaluate behavior in terms of the degree in which the participants will apply the training contents on their jobs and, finally, evaluate the results by trying to access if the prior targets for the training were accomplished (Kirkpatrick & Kirkpatrick, 2013).

Furthermore, some authors (Sailer et al., 2017; Zaniboni, Fraccaroli, Truxillo, Bertolino, & Bauer, 2011) stated that training motivation is indeed a key factor to ensure training effectiveness. According to Zaniboni et al. (2011), this motivation is influenced by a wide variety of factors that include personality, attitudes and behaviors, organizational commitment, self-efficacy and goal orientation.

The need to find effective methods to transfer knowledge from the trainer to the workforce is of high importance, due to the fact that learning and development contribute to competitive advantages for the organization (Armstrong & Landers, 2018; Gupta & Gomathi, 2017). Learning organizations are the result of a shared training process, where organizations are more flexible on reacting to the emerging needs and become more competitive in the labor market (Armstrong & Landers, 2018).

2. Games – what are and how are they supposed to be constituted

The virtual reality is dated back to the 1960s and it involves several perceptions, real sense of the virtual world and interactivity (Li, Li, Jiao, & Xiao, 2017; Sailer et al., 2017). One of the most used virtual instruments that can provide interaction are the games. The games concept needs to be defined in order to understand what it involves, and which are the main characteristics that define them.

Some other authors, as Salen and Zimmerman (2004) have agreed with the idea that a game is "a system in which players engage in an artificial conflict, defined by rules. That results in a quantifiable outcome" (Kapp, 2012: 7). This effect produced will depend on the player's performance and how have he/she dealt with those rules, that appear as boundaries to the clear and easy well succeeded experience (Deterding, Dixon, Khaled, & Nacke, 2011).

A simple game can be an entertainment or non-entertainment activity that is always based on game features in which the purpose is only to lead the user to attain a certain goal (Çeker & Özdamli, 2017). Great games need, according to Reeves and Read (2009) ten ingredients: self-representation with avatars; three-dimensional environments; narrative context; feedback; reputations, ranks and levels; marketplaces and economies; competition under explicit and enforced rules; teams; parallel communication systems that can be easily configured; time pressure (Deterding et al., 2011).

As per Deterding et al. (2011), the players try to overcome obstacles in a game that are necessary to get a better result in the end and this challenging process creates addiction and, moreover, engagement.

2.1. The reasons behind playing games

Over the years, games have become more popular in all ages and genders (Sailer et al., 2017). According to Prensky (2003), someone with 21 years old should have spent, in average, 10,000 hours playing computer or videogames (the called *generation.com*). Besides the entertaining and challenging parts, it is important to understand why games are so interesting to stuck someone at this scale. Despite the adventure, violence or the subject of the game, players enjoy the learning experience provided (Armstrong & Landers, 2018; Çeker & Özdamli, 2017).

More than enabling them to do things that are not possible in the real world, a game allows the players to gather information from different sources, make decisions, understand the rules and create strategies (Dichev & Dicheva, 2017; Faiella & Ricciardi, 2015; Piteira, 2017). The game experience and its environment become to be much more than a simple simulation, because it has a proper alternative reality and system, full of particular characteristics (Kapp, 2012). This context is expected to include challenges, rules, interaction between players, constant feedback and quantifiable outcomes, while experiencing some emotional reactions (Kapp, 2012). The behaviors triggered in the participants will then impact their overall involvement and engagement, and this process needs to be understood.

Several authors (Dichev & Dicheva, 2017; Kapp, 2012; Mielniczuk & Laguna, 2017; Ryan & Deci, 2000) conducted research regarding motivation and pointed that behavior can be intrinsically or extrinsically motivated. A motivation is considered intrinsic when it has to do with the process itself, the challenge, curiosity and fantasy, but the extrinsic motivation happens when the focus is in the outcomes that the player can get in the end of the activity (Dichev & Dicheva, 2017; Garris et al., 2002). In this line of thinking, the learners' perception and behavior have been studied in terms of what keeps them motivated in some activity (Aguinis & Kraiger, 2009; Mielniczuk & Laguna, 2017; Ryan & Deci, 2000). The games are in fact appealing because of their allowance to produce intrinsic motivation in the players through competence, relatedness and autonomy (Kuutti, 2013 Mielniczuk & Laguna, 2017; Ryan & Deci, 2000)(Julius, 2013; Mielniczuk & Laguna, 2017; Ryan & Deci, 2000).

3. Gamification – the concept and its usage within organizations

Gamification is viewed as part of the Human Computer Interaction (HCI), from the game design perspective and its techniques, being able to influence individuals' engagement, motivation, productivity and, consequently, change their behaviors (Çeker & Özdamli, 2017; Gupta & Gomathi, 2017).

The game and gamification concepts are mixed sometimes, although it is not acceptable to consider that gamification is literally a game (Armstrong & Landers, 2017; Çeker & Özdamli, 2017). Both concepts should be treated separately and the authors differentiate them in terms of the origin, as games are being used since the old ages while the term gamification only appears documented as a concern for research around 2010, even though the term was coined in 2002 (Çeker & Özdamli, 2017; Dichev & Dicheva, 2017; Faiella & Ricciardi, 2015). Thus, a gamification scenario is not literally the same as playing a simple game and when a game is played, it does not mean that we are in front of a gamification situation (Çeker & Özdamli, 2017).

The gamification concept is picking up pace since 2010 and it tends to make evident some human desires, such as competition, achievement, self-expression and altruism by using game mechanisms (Dichev & Dicheva, 2017; Gupta & Gomathi, 2017; Piteira, 2017). In gamification contexts, instead of achieving a game purpose, the attendees are involved in non-game environments but with the game design characteristics acting as a driver to achieve another purposes and making the activity more interesting (Deterding et al., 2011; Dichev & Dicheva, 2017; Wangi et al., 2018). This means that the game design elements are used partially, and it is expected that all the users apply the game rules and principles to perform accordingly and achieve a goal that is not directly related to the game itself (Çeker & Özdamli, 2017; Deterding et al., 2011; Dichev & Dicheva, 2017). In these scenarios, the game elements are used for purposes other than the normal and expected ones, such as entertainment game purposes, and some techniques should be used to accomplish these final goals (Çeker & Özdamli, 2017; Dichev & Dicheva, 2017; Faiella & Ricciardi, 2015).

The design knowledge and technological aspects are embedded in gamification in an expertise level and, in this case, the game itself is not the focus and just acts as a facilitator to shape the attendees' behavior toward the right direction (Çeker & Özdamli, 2017). This idea is also agreed by most of consultants and vendors, to whom gamification is identified as "the adoption of game technology and game design methods outside of the games industry" or "the process of using game thinking and game mechanics to solve problems and engage users" (Deterding et al., 2011: 2). As stated by some authors (Deterding et al., 2011; Faiella & Ricciardi, 2015), despite the term refers mostly to digital scenarios, gamification should be considered in a broader way.

3.1. The relationship between gamification and similar concepts

Due to its complexity and subjectivity, the idea about gamification and its proper meaning has been mixed with other concepts even in the literature (Deterding et al., 2011; Dichev & Dicheva, 2017). Deterding et al. (2011) have proposed a framework to distinguish gamification, also known as gameful design, from the closest definitions. The authors differentiate the concepts via two dimensions: parts/whole and playing/gaming.

Table 1: Gamification and the related concepts

	WHOLE	**PARTS**
GAMING	Serious games	Gameful design (Gamification)
PLAYING	Toys	Playful design

Source: Deterding et al. (2011)

The dimension whole/parts define how much of the game is included to build the tool or gamified system. Serious games are constructed as full-fledged games (such as the toys), which means that the game is incorporated completely in the activity. On the other hand, gamified applications (gamification) do not use the game totally but only incorporate some game elements, that are significant and present in most of the games. The same applies for the playful design methods. (Deterding et al., 2011; Faiella & Ricciardi, 2015; Kapp, 2012)

The concepts of serious games and gamification were found to be somehow in a grey area when restricted for learning and education contexts (Deterding et al., 2011). Nevertheless, both techniques might be applied in other scenarios and purposes, so the definitions should remain open and wide as possible. This idea leads to have a look at the second dimension (gaming/playing) defined by Deterding et al. (2011), where gamification and serious games are distinguished from toys and playful design due to their broader intention than entertainment. In this case, it is essential to have a clear picture on the tool designers' intentions to categorize if a system/activity is considered gamification.

Despite the gamification concept has been mixed with similar ones, it has been established as the "household term". These gamification systems are not "proper games" but they are easily adjusted due to their instability and openness (Deterding et al., 2011).

In line with some studies (Deterding et al., 2011; Dichev & Dicheva, 2017; Mielniczuk & Laguna, 2017) this is a subject area to which researchers have been paying attention during the last years and is still growing, since the widespread adoption of the term dates to 2015. Gamification is commonly used in contexts where game elements are made part of non-game products/services but require to trigger enjoyable and engaging experiences (Deterding et al., 2011; Dichev & Dicheva, 2017; Kapp, 2012).

Another term that is correlated with these is the game-based learning where, in a game context, the users are supposed to attain learning marks while playing games (Çeker & Özdamli, 2017; Prensky, 2003). In this scenario, the game is usually the major part of the experience and the learning process depends on it, which does not occur in gamification scenarios (Çeker & Özdamli, 2017). As per Çeker & Özdamli (2017), in a gamification situation the game is not enough to substitute the learning progression itself but enhances the process, by facilitating it and creating engagement on the participants.

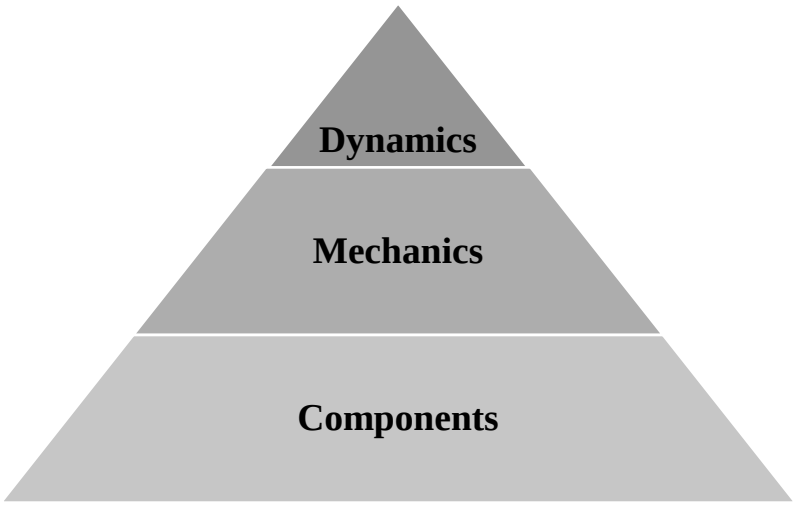
3.2. Gamification elements – mechanics, dynamics and components

Gamification brings the idea of incorporating one or more game elements into environments that are not meant only for leisure activities (Deterding et al., 2011; Dichev & Dicheva, 2017; Piteira, 2017). Per Deterding et al. (2011) studies, these game elements are features or conditions that are commonly used in games and make them happen as expected, such as points, levels, avatars, virtual coins and badges.

To assimilate what game elements are, the mindset should not be either too liberal or too broad, as some boundaries might be needed (Deterding et al., 2011). According to the authors (Deterding et al., 2011), the use of game elements can occur in terms of game technology, game practices or merely game design elements like in the case of gamification.

The common gamification methodologies take these elements into a non-gaming context and, according to Piteira (2017), they are significant for the purpose and are associated with most of the entertainment games. Based on some studies, Dichev & Dicheva (2017) have proposed a framework to distinguish the different game elements that can be incorporated into gamification scenarios, naming them mechanics, dynamics and components.

Figure 1: Pyramid of the Game Elements



Source: Dichev & Dicheva (2017)

Starting from the top, dynamics represent the higher, most abstract and conceptual level of game elements. They include constraints, emotions, narrative, progression and relationships that are implicit and in the roots of the game, constituting its essence (Dichev & Dicheva, 2017; Gupta & Gomathi, 2017; Piteira, 2017).

Second, the mechanics cover the set of rules that moderate the outcome of the player-system interaction, such as challenges, chance, competition, cooperation, feedback, resource acquisition, rewards, transactions, turns and win states (Dichev & Dicheva, 2017). The users will be guided and motivationally boosted thorough these set of characteristics (mechanics) that, furthermore, will trigger reactions and responses (dynamics) in the individuals (Dichev & Dicheva, 2017; Gupta & Gomathi, 2017).

Last but not the least, the components are the most specific group of elements and the elementary level in the gamification process. Achievements, points, avatars, badges, leaderboards, gifts, content unlocking, collections, levels and virtual goods are some examples of components(Dichev & Dicheva, 2017; Julius, 2013) (Dichev & Dicheva, 2017; Kuutti, 2013). These specific instances are clearly perceived by the players and can also be part of a mechanic (Kuutti, 2013).

These game elements, especially the components, can be combined and incorporated in gamification for education, as per the majority of educational studies gamification-based (Dichev & Dicheva, 2017). As per the authors, these three elements can be interrelated, for example, the points (components) deliver rewards (mechanics) that foster a progression sensation (dynamics).

In line with the authors (Dichev & Dicheva, 2017), the most commonly applied elements are points, badges, leaderboards, levels and progression bars. In fact, the reason behind the overuse of these components, mainly the PBL (Points, Badges and Leaderboards), can be the easy implementation and the expected conformity of the participants when finding them (Dichev & Dicheva, 2017; Piteira, 2017). Additionally, the authors (Dichev & Dicheva, 2017) pointed out that is more scarce to see gamification applications using dynamics and mechanics, when compared with components.

The disagreement among the literature is evident, some authors seem to believe that including one of the elements, we are already producing gamification but, on the other hand, some believe that not all of them add a relevant value to learning experiences (Faiella & Ricciardi, 2015; Kapp, 2012). Although, including these elements into a learning activity, combining them with the subject to assimilate, should not be enough to produce gamification. This is due to the fact that gamification also implies the strong motivation produced in the attendees and the retention improvement provided by the gamified experience (Deterding et al., 2011; Dichev & Dicheva, 2017; Faiella & Ricciardi, 2015; Piteira, 2017).

The connection between gamification design and motivation has been shown in several studies, however there is still no strong convincing evidence about the effect of gamification as an instrument (Dichev & Dicheva, 2017; Piteira, 2017).

3.3. Gamification as an effective tool for training

Companies have been seeking for new techniques and games were found to be a great methodology to use as a substitute to the conventional ways for many purposes, such as training (Caponetto, Earp and Ott, 2014; Mielniczuk & Laguna, 2017). Besides all the meanings and believes about the concept, gamification is still a phenomenon that is getting relevance and growing in terms of knowledge (Dichev & Dicheva, 2017; Landers, 2014). Additionally, the term became controversial among the experts on the subject, such as game designers, theorists and researchers (Dichev & Dicheva, 2017). At this point, most of the studies do not lead to conclusive results due to use of samples that are not representative, subgroups in the sample that are not comparable, short timeframes and lack of statistical reliability (Armstrong & Landers, 2017, 2018; Dichev & Dicheva, 2017; Faiella & Ricciardi, 2015; Landers, 2014).

For Çeker & Özdamli (2017), even though it is hard to materialize the idea of gamification, there are some reasons behind using it as an interesting and convenient approach for learning. Hard tasks, for example, can become more manageable, enjoyable and motivating activities when gamification is included. Also, this new paradigm allows the participants to be more focus and satisfied with their business performance, promoting an overall effective learning process (Çeker & Özdamli, 2017; Gupta & Gomathi, 2017; Sailer et al., 2017).

According to Armstrong & Landers (2018), gamification often improves the training outcomes while the current methodologies stand below expectations for the knowledge transfer. The authors studied the impact of different elements on learning, and indeed they affect different behavioral and psychological facets in the individuals (Armstrong & Landers, 2018). The impact of these elements is overall positive but there is little research on their isolated effect on training effectiveness. Thus, caution is needed, and gamification will be mostly effective when combined with instructional design principles. The simple introduction of game elements into the training experience is not likely to bring desirable outcomes for learning (Armstrong & Landers, 2018; Çeker & Özdamli, 2017).

Although, some authors (Mielniczuk & Laguna, 2017; Prensky, 2003; Zaniboni et al., 2011) believe that a great part of the investment in training has not returned many results, due to the fact that current learning approaches are not functional anymore. Learners from today seem to have in fact different expectations, values and objectives integrating them in the continuous digital transformation (Dichev & Dicheva, 2017; Wangi et al., 2018). In the study conducted by Wangi et al. (2018), the Indonesian university students received game techniques very positively, considering that they bring interest to the course and make them more active in the learning process. In fact, most of the studies tend to favor gamified techniques rather than conventional ones (Çeker & Özdamli, 2017; Dichev & Dicheva, 2017). Although, and since there is not yet strong and convincing evidence on the impact of game features in the training effectiveness, it was found relevant to study their relationship. Furthermore, and as mentioned by some authors (Dichev & Dicheva, 2017; Faiella & Ricciardi, 2015), there seem to be a considerable difference on the training effectiveness when applying gamified techniques or not. This idea will be tested as per the hypotheses presented below.

H1: Gamification elements (such as points, badges and avatars) have a positive effect on training effectiveness

H2: There is a difference between training effectiveness for gamified trainings and training effectiveness for non-gamified trainings

3.4. Successful gamification applications for Human Resources in the workplace

The gap between academic research and practical usage is already acknowledged, due to the fact that many companies, such as L'Óreal, Unilever, Microsoft, Deutsche Bank and McKinsey have been applying gamification in the workplace, although there are not enough conclusions in literature to explain how gamification impacts (Ferreira, Araújo, Fernandes, & Miguel, 2017; Gupta & Gomathi, 2017).

Game elements have been incorporated into training within organizations to create gamification scenarios and, consequently, more interactive learning activities (Dichev & Dicheva, 2017; Gupta & Gomathi, 2017; Kapp, 2012). Per Gupta & Gomathi (2017), there are several gamification platforms that allow the usage of gamified solution in the organizational context, such as Badgeville, Gamify, Cloud Captive, SpectrumDNA and Bunchball.

Gamification is broadly perceived as a strategy for learning purposes that can bring efficient training sessions, since it promotes friendly competitive environments, influence, motivate and engage employees on achieving learning objectives (Gupta & Gomathi, 2017).

According to Gupta & Gomathi (2017), the first steps to put in practice a gamification application in the workplace were in 2007 when Bunchball launched a gamification platform for employee engagement, team motivation and customer satisfaction. Furthermore, the academic interest and research on the topic appears more recently in 2010 (Deterding et al., 2011; Gupta & Gomathi, 2017; Landers, 2014).

Nike+ app, a running application that records some indicators as the distance and the calories burned, was a successful case (Gupta & Gomathi, 2017). The introduction of this application promoted, according to the authors (Gupta & Gomathi, 2017), to build a fan community and impact motivational and productivity levels on the users.

4. Motivation - the concept and its importance for training

In the business context, motivation is a concern for people who need to mobilize the others to do something, such as managers, supervisors and leaders that are required to enhance their subordinates' motivation levels (Mielniczuk & Laguna, 2017; Ryan & Deci, 2000).

Motivation begins to be related with task achievements, by overcoming the difficulties crossed along the way and aiming to be well succeeded as soon as possible (Wangi et al., 2018). According to the authors (Wangi et al., 2018), motivated people tend to enhance and maintain competence in various fields. The reason behind motivation can be in general lines internal, if there are personal reasons and believes implied, or external if there are pressure actors from the outside (Mielniczuk & Laguna, 2017).

4.1. Types of Motivation and the Self-Determination Theory

Many authors have introduced the idea that the outcomes are better when people are authentically motivated, rather than just controlled by an external pressure (Mielniczuk & Laguna, 2017; Ryan & Deci, 2000). Then, it is important in the first instance to understand the different types of motivation and how do they affect individuals' performance.

Self-motivation and personality integration have been grounded, according to the Self-Determination Theory, in three innate psychological needs – competence, autonomy (self-determining) and relatedness (Bauer, Orvis, Ely, & Surface, 2016; Mielniczuk & Laguna, 2017; Ryan & Deci, 2000; Sailer et al., 2017). According to the authors (Bauer et al., 2016), competence refers to efficacy when performing a specific task, self-determining is concerning autonomy feelings and relatedness to social relations. The SDT states that if these three conditions are sought to be satisfied, the individuals' behaviors are intrinsically motivated (Bauer et al., 2016; Ryan & Deci, 2000).

According to Mielniczuk & Laguna (2017), when these conditions are satisfied, the self-motivation of the individuals is enhanced, especially when people are seeking for higher organizational positions or to fulfill satisfaction needs. This theory derives from the distinguish between intrinsic and extrinsic motivation, grounded on the cognitive evaluation theory (Mielniczuk & Laguna, 2017; Ryan & Deci, 2000).

The researchers Mielniczuk & Laguna (2017) relate the concept of intrinsic motivation to the spontaneous satisfaction and enjoyment from the involvement in some activities, rather than reasons from external pressures. Thus, these ideas are grounded in the definition for intrinsic motivation: "natural inclination toward assimilation, mastery, spontaneous interest and exploration that is so essential to cognitive and social development and that represents a principal source of enjoyment and vitality throughout life." (Ryan & Deci, 2000: 70).

The intrinsic motivation, which includes being interested, satisfied and persistent on something, is perceived as an innate propensity that can be sustained or reduced by the psychological conditions defined in the Self-Determination Theory (Bauer et al., 2016; Mielniczuk & Laguna, 2017; Ryan & Deci, 2000). On the other hand, extrinsic motivation consists on being pressured to perform an activity due to instrumental reasons that come from the outside and depend upon the internalization of extrinsic motivated behavior (Ryan & Deci, 2000; Mielniczuk & Laguna, 2017). However, in the end of the day, intrinsic motivation was found to be the most powerful type of motivation when it has to do with results achievement (Mielniczuk & Laguna, 2017). Barry Fishman, a Professor of Learning Technologies in the University of Michigan, has explained that by supporting these three dimensions, someone is able to fulfill the needs to keep motivated (Fishman & Deterding, 2013).

Moreover, the SDT was found relevant to apply in training scenarios to understand why does someone enroll in this type of activities (Bauer et al., 2016; Mielniczuk & Laguna, 2017). Based on some theoretical frameworks, such as the Self-Determination theory, the Expectancy theory and the Expectancy-Value theory, Bauer et al. (2016) have talked about five types of motivation – intrinsic motivation, motivation to learn, motivation to transfer, expectancy motivation and task value.

Some authors (Bauer et al., 2016; Mielniczuk & Laguna, 2017) have compared these motivation types among them and their practical application in training contexts. The intrinsic motivation emphasizes the enjoyment and the satisfaction need, such as enjoying the training content. The motivation to learn brings the idea of expectancy, believing that effort on the training will allow the return of good performance in the end. On the other hand, motivation to transfer is grounded also in expectancy but in this case related to the skills that the training will provide and how can they be applied in the job. Further, expectancy motivation brings the connection between efforts, performance and the long-run outcomes than can emerge, such as a job promotion.

Last but not the least, task value is the type of motivation where interest of the topic, usefulness of the training and its importance for the participant are gathered.(Bauer et al., 2016; Mielniczuk & Laguna, 2017).

4.2. Training motivation – the concept and meaning in practice

Motivation can be rooted to goal orientation and, a study on the 90s was conducted to analyze the relationship between goal orientation, both on a learning or performance perspective, and motivational constructs (Zaniboni et al., 2011). In a training context, the authors found out that learning goal orientation is positively correlated to motivation to learn and in fact, objectives and challenges seem to able to keep someone motivated when being part of a training session. (Zaniboni et al., 2011)

Participating in a training session requires the participant's motivation and should be addressed as a process of goal realization (Mielniczuk & Laguna, 2017) which includes four steps: pre-decisional, pre-actional, actional and post actional. In the pre-decisional phase, the participants decide their desires and expectations to fulfill and in the pre-actional steps, these behavioral intention become goal attainments and action plans that keep the goal intention safe (Mielniczuk & Laguna, 2017). In the third, the actional phase, the activity that allows the goal realization is initiated and, as soon as it is achieved, the post actional phase brings the outcomes of this goal and its evaluation (Mielniczuk & Laguna, 2017).

The authors have made a comparison between the goal realization and the training activity and it is expected that the first two steps completion bring intention to initiate the training action (Mielniczuk & Laguna, 2017). Although there are other environmental and organizational factors, besides the learning goal orientation that might affect the motivation for the training and, therefore, the training outcomes (Zaniboni et al., 2011).

In fact, training motivation definitions diverge on the meaning between phenomenological and behavioral (Zaniboni et al., 2011). From the first one, the authors include the desires, interests and involvement in the learning process and, in a behavioral way, the effort to learn and the intention to accomplish the goals. Many conceptualizations have led to different measure approaches for the training motivation variable during the last 30 years (Zaniboni et al., 2011).

There is no consistence in what extend motivation can be measured in learning contexts and how does this concept affect the training effectiveness, when comparing the various types of motivation (Bauer et al., 2016; Colquitt, LePine, & Noe, 2000). The authors (Bauer et al., 2016) compared the relationship between motivation and learning outcomes and how could the type of motivation considered could affect each training outcome (reactions, learning, behavior and

results) defined by Kirkpatrick & Kirkpatrick (2013). After the study, it was found that the relationship between motivation and training outcomes are more similar within one of the training outcomes than within a type of motivation.

Due to the variety of perspectives that can be used to study the training motivation, a multi-dimensional model should be more elucidative in regards to measurement of this variable (Bauer et al., 2016; Zaniboni et al., 2011).

4.3. The mediation effect of Training motivation in the relationship between Game Features and Training effectiveness

Looking at the Human Resources processes, training requires for the participants to be engaged and motivated in order for the session to be effective (Mielniczuk & Laguna, 2017; Zaniboni et al., 2011). Due to the extend research on training and development topics, the study about how can motivation impact training effectiveness have been considered relevant (Bauer et al., 2016; Colquitt et al., 2000).

The motivation for a training activity can be influenced by several personal characteristics, such as the personality, the attitude toward training, the job involvement and the organizational commitment (Bauer et al., 2016; Zaniboni et al., 2011). According to Mielniczuk & Laguna (2017), the motivation for the training is a crucial condition and has even more considerable impact on the learning outcomes than the cognitive abilities of the trainee.

Experts on this topic talked about the idea that it is better to be intrinsically than extrinsically motivated, although we need both. Special contexts, such as games and learning environments, require a blend motivation level that includes intrinsic and extrinsic reasons (Fishman & Deterding, 2013).

The specialists have explained how the three needs of the Self-Determination Theory can be supported to create motivational learning environments (Fishman & Deterding, 2013; Ryan & Deci, 2000). Regarding support for autonomy, it is important to empower the trainees and allow them to make some decisions, customizing their learning process. In terms of relatedness, the participants need to feel that they belong somewhere an part of a community where they share similar goals with the instructor. And third, concerning the support for competence, the training needs to be somehow challenging where the learning objective are not too easy and not utopic, but achievable (Fishman & Deterding, 2013; Ryan & Deci, 2000).

According to Kapp (2012), gamification elements are used to reward good behaviors in educational games, allowing a motivation increase and strengthening the motivation level and the learning process (Costa, 2017; Garris et. al, 2002). However, it is not clear that this motivation created through the games bring more effective learning processes (Garris et al., 2002).

H3: Training motivation mediates the relationship between gamification elements (such as points, badges and avatars) and training effectiveness

Including gamification into the learning environments has been shown to intrinsically motivate the participants, bringing fun, authenticity, experience of social bonds and self-reliance (Faiella & Ricciardi, 2015). As pointed by Dichev & Dicheva (2017), there are great examples that corroborate the idea that gamification can be a motivational tool due to the achievement of the instructional objectives when using this methodology for training sessions.

Attendees value the inclusion of the gamification elements while learning and, at the first sight, they seem to be boosting participants' motivation (Çeker & Özdamli, 2017; Dichev & Dicheva, 2017) . Although, it is not easy to generalize this idea because the effect of the gamification usage in motivation will always depend on a bunch of factors implied (Dichev & Dicheva, 2017). The game elements used, the training environment, the sample characteristics and the learning subject are some of the circumstances that may restrict the outcomes of the studies that have been performed in the past years (Armstrong & Landers, 2018; Dichev & Dicheva, 2017).

Later on, Dichev & Dicheva (2017) bring the idea that current studies on gamification often relate this approach to the learning outcomes and how can game design elements improve learning experiences. Even though, there is no convincing evidence that settle the effect of gamification on motivating individuals. (Dichev & Dicheva, 2017). According to some of the mentioned authors (Dichev & Dicheva, 2017; Mielniczuk & Laguna, 2017), motivational effects promoted by gamification and its role on the learning process are still a subject which has limited information on, which makes this a pertinent research concern.

5. Work engagement – the concept and its role for training motivation

During the last 20 years, more attention has been given to positive psychology states, complementing the conventional studies on psychological diseases, lack of stability and disorders (Carmona-Halty, Salanova, Llorens, & Schaufeli, 2019; Schaufeli, Bakker, & Salanova, 2006). One of them is the concept of work engagement which stands for the opposite state of mind of burnout, meaning that someone engaged in a job is full of energy, completely connected with it and that have predisposition to answer any demands (Bakker & Albrecht, 2018; Schaufeli & Bakker, 2004; Schaufeli et al., 2006). Moreover, energy, involvement and efficacy are usually good defining work engagement while exhaustion, cynicism and reduced professional efficacy can define burnout (Bakker & Albrecht, 2018; Schaufeli & Bakker, 2004).

According to the Maslach Burnout Inventory, a person is work engaged if the result includes low scores for exhaustion and cynicism and high score for professional efficacy. Although, both terms should be considered independent concepts due to lack of total opposition between them and for research reasons (Schaufeli & Bakker, 2004). Later, work engagement has been defined as a product of dedication, vigor and absorption, that persists for some time as an affective-cognitive state (Bakker & Albrecht, 2018; Schaufeli & Bakker, 2004; Schaufeli et al., 2006).

Many authors (Carmona-Halty et al., 2019; Schaufeli & Bakker, 2004; Schaufeli et al., 2006) have defined and talked about these three engagement constructs. First, vigor has been mentioned to relate with high energetic levels, resilience and persistence at work even if the circumstances are not easy. In the second place, dedication is all about being involved in the work tasks, feel enthusiastic, inspired and willing to be challenged. And third, absorption is perceived when someone is fully concentrated, feeling the time flies at work and cannot even detached from it.

Engaged employees usually are the creators of their own positive feedback and have a lot of initiative and focus in their work, being active agents (Bakker & Albrecht, 2018; Schaufeli & Bakker, 2004). Nevertheless, the Schaufeli & Bakker (2004) said that this does not mean that engaged workers are never tired or that they are workaholics that do not have other activities besides their job. On the other hand, engaged employees seem to associate tired moments to big accomplishments and that they found work to be fun, even though they value and appreciate (Schaufeli & Bakker, 2004).

5.1. The moderation role of Work engagement in the relationship between Game Features and Training effectiveness, mediated by Training motivation

High levels of engagement have been positively related to the job resources, defined as the job characteristics that might be able to reduce job demands (Schaufeli & Salanova, 2007). These job resources have the potential to satisfy psychological needs (autonomy, relatedness and competence), highlighted on the Self-Determination Theory (Ryan & Deci, 2000) that therefore can enhance well-being and intrinsic motivation (Mielniczuk & Laguna, 2017; Schaufeli & Salanova, 2007).

The organizational and career commitment of the individuals within the organization where they work for are expected to improve the way training is viewed as useful (Colquitt et al., 2000). According to the authors, many researches have shown that the more someone is committed, the more he/she is motivated to learn and look at training as a useful activity and with meaning for job performance improvements and feelings of self-worth (Colquitt et al., 2000).

H4a: Work engagement moderates the relationship between gamification elements (such as points, badges and avatars) and training motivation

H4b: Work engagement moderates the relationship between gamification elements (such as points, badges and avatars) and training effectiveness mediated by training motivation

There are many personal and organizational factors affecting training motivation and, therefore, the relationship between game features and motivation for the training is expected to not require work engagement embedded in the process. Thus, it might be interesting to study the role of work engagement as a moderator of the relationship between the inclusion of game features and the training motivation.

6. Open-mindedness – the personality implications for training

Personality has been studied in a wide variety of ways during the years and all of the levels approached have been contributing in a useful way to understand how humans behave and experience something (Colquitt et al., 2000; Soto & John, 2017; Srivastava & John, 1999). Along the time, and due to many diverse conceptualizations on the subject, the need to define a scientific taxonomy that would bring a common language started to be needed (Colquitt et al., 2000; Soto & John, 2017). This is when the general taxonomy of the Big Five Model brought some consensus among the researchers (Soto & John, 2017; Srivastava & John, 1999).

After paying attention on the natural language of the personality traits definitions and many research and authors involved, the Big Five OCEAN framework appears, defining the five salient personality traits (Soto & John, 2017; Srivastava & John, 1999): Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism.

First, openness defines someone curious, with imagination, wide interests and excitable. Second, the conscientiousness aggregates efficiency, organization, not laziness and not careless. Extraversion stands for enthusiastic, sociable, energetic and adventurous persons. Regarding agreeableness, it brings trustworthy, altruism, compliance, modesty and deliberation. Last but not the least, neuroticism is related to anxiety, depression, impulsiveness and vulnerability (Soto & John, 2017; Srivastava & John, 1999).

Furthermore, the original Big Five Inventory (BFI) was adapted and Soto & John (2017) raised the Next Big Five Inventory (BFI-2) with the aim to define multiple facet traits based on the original five dimensions. The authors renamed neuroticism into negative emotionality in order to avoid tendencies to relate this dimension with clinical and illness states, such as anxiety and sadness. Also, the domain openness was renamed as open-mindedness with the objective of focusing on the individual's psychological traits instead of social life characteristics (Soto & John, 2017). The outcome of this new scale is, summing up, five domain scales – extraversion, agreeableness, conscientiousness, negative emotionality and open-mindedness – and fifteen facet scales – sociability, assertiveness, energy level, compassion, respectfulness, trust, organization, productiveness, responsibility, anxiety, depression, emotional volatility, intellectual curiosity, aesthetic sensitivity and creative imagination (Soto & John, 2017).

For the present research, the focus will be on the domain of open-mindedness which aims to be studied in relation with other variables. the authors included the facets of intellectual curiosity, creative imagination and aesthetic sensitivity in this dimension, which is broadly conceptualized by intellectual curiosity rather than the other two (Soto & John, 2017).

Additionally, openness is related to the sensorial capacity to appreciate patterns of information by understanding and utilizing them (DeYoung, 2014; Soto & John, 2017). Although it was in the past named as intellect, culture or sensation versus intuition, the term was acknowledged by some authors as a group of cognitive, learning and reason attribution abilities (McCrae & Costa, 1997; Soto & John, 2017). Open-mindedness refers then to the predisposition to be part of mental experiences, rather than social ones as it might lead a first understanding (Soto & John, 2017).

Some authors have also related the items of the newly established Big Five Inventory with the personality dimensions and thus, open-mindedness and specially the intellectual curiosity are found to be linked with the personal growth well-being (Soto & John, 2017).

6.1. The moderation role of Open-mindedness in the relationship between Game Features and Training effectiveness, mediated by Training motivation

Personality is indeed found in various theories of motivation due to its leverage on creating cognitive personal environments, which brings behavioral changes between individuals (Colquitt et al., 2000; Soto & John, 2017). Some personality traits, such as achievement motivation, locus of control, conscientious, extraversion and cognitive playfulness was considered to have a positive impact in the attitude toward training (Colquitt et al., 2000; Thompson, 2013).

H5a: Open-mindedness moderates the relationship between gamification elements (such as points, badges and avatars) and training motivation

H5b: Open-mindedness moderates the relationship between gamification elements (such as points, badges and avatars) and training effectiveness mediated by training motivation

Having a deeper look on cognitive playfulness, this facet was defined as the ability to get satisfaction from the intellectual development, despite any hidden reason or motive (Martocchio & Webster, 1992; Thompson, 2013). Furthermore, Martocchio & Webster (1992) stated that playful persons are usually able to attribute their own meanings to the surrounding objects and actions, while they are involved and internally motivated. The cognitive playfulness is, then, an important construct in the human-computer interaction because of the cognitive basis of this relationship (Martocchio & Webster, 1992; Thompson, 2013).

In fact, individuals that show higher levels of cognitive playfulness demonstrate higher learning interest, satisfaction and optimistic mood in what concerns training activities (Martocchio & Webster, 1992; Thompson, 2013).

All the concepts above, and especially the open-mindedness, seem to have the power to influence the relationship between creative scenarios, such as gamified ones, and the way someone is motivated for a training activity (Martocchio & Webster, 1992; Soto & John, 2017; Thompson, 2013).

CHAPTER II – METHODOLOGY

1. Procedure

This study was developed based on an online questionnaire that, after prepared both in Portuguese and English languages, was distributed to people that have attended training sessions where some gamification features were included. In order to avoid any future complications regarding data protection, the questions were prepared without any individual or organizational names. In the next sections, the measures used for the study will be presented with the references of the original sources. For the scales that were not available in Portuguese, the English instruments were translated.

The tool used to prepare the survey was Google Forms due to more accessibility to prepare, distribute via link and gather all the data in the end. The questionnaire was launched on the May 5th of 2019 and the respondents were able to fill in the form until the July 31st of 2019, the day when the results were extracted.

With the aim to find the relevant respondents for the study, a search was conducted to find the most relevant companies in Portugal that have been using gamified approaches in their trainings. Due to the lack of openness to distribute the questionnaire within the companies and the scarce target group in the country, it was found relevant to start contacting people abroad.

The possible respondents were contacted from the February 5th of 2019 with the main goal to see if their companies were using gamified training approaches and what would be the availability to distribute the survey internally. The first goal was to find people that were part of the Learning and Development, Training, Human Resources department or from the Board of Management in the companies that were likely to be using gamification.

Since not much of the contacted persons were answering, people from other companies that were not covered in the beginning were contacted as well. The criteria to select the relevant contacts was the position in the company. In this case several job positions were considered, such as learning and development specialists, trainers, instructional designers, heads of the HR department, training managers, HR specialists, recruitment technicians, CEO and CHRO. Besides these, many people that were associated with gamification, e-learning, digital transformation and user experience (UX) fields were also messaged in order to ask if they were

aware of companies that were using gamification-based trainings. Furthermore, the questionnaire was published in gamification and game-based training Facebook groups and pages. In the meanwhile, relevant academic professors from ISCTE-IUL were contacted, plus the responsible for the new INDEG-ISCTE program - *Applied gamification program: fundamentals & action. A jogar é que a gente se entende*.

After all the contacts, one of the contacted companies showed interested in the project due to their current application of the methodology and a face-to-face meeting occurred in one of their offices. Afterwards, this company denied the questionnaire distribution and two other companies accepted to distribute the survey internally (Company A and Company B).

Since the 5th of February until the 31st of July 2019, 753 possible respondents were contacted via private message in LinkedIn. From this number, only around 40% got back with an answer.

2. Sample

The results from the four questionnaires (Portuguese, English, Company A and Company B) questionnaire were merged and the final total sample included 128 valid answers. The data was treated in the IBM SPSS statistics version 24 program.

Before sending the questionnaire, a previous verification was done in order to send the survey only to people that have attended gamified trainings.

3. Measures

***Training effectiveness*.** The Participant Survey of the Kirkpatrick Four Levels was used to measure training effectiveness, both for gamified and non-gamified trainings (Kirkpatrick & Kirkpatrick, 2013). The four levels considered by the authors – learning environment, relevance, delivery and Overall – were measured with 10 items in a 4-point Likert scale from 1 to 4: 1 = "Strongly disagree"; 2 = "Disagree"; 3 = "Agree"; 4 = "Strongly agree". These items are part of the 4 subscales learning environment, relevance, delivery and overall. The value of the Cronbach's alpha is 0.92 for Training effectiveness on gamified trainings and 0.95 for non-gamified trainings.

User experience satisfaction. To study the gamification features inclusion in gamified trainings, the closest measure considered relevant was the user experience satisfaction (Phan, Keebler, & Chaparro, 2016). For this research, 3 sub-scales from the game user experience satisfaction Scale (GUESS) were analyzed – usability/playability, enjoyment and personal gratification. This measure was evaluated based on the 22 items that are part of the 3 previous mentioned subscales with a 7-point Likert scale from 1 = "Strongly Disagree" to 7 = "Strongly Agree". The value of the Cronbach's alpha stands on 0.96.

***Training motivation*.** The training motivation variable was assessed by using the Training Valence, Instrumentality, and Expectancy scale (T-VIES) (Zaniboni et al., 2011). The subscales valence, instrumentality and expectancy were evaluated with 9 items, in a 5-point Likert scale: 1 = "Strongly disagree"; 2 = "Disagree"; 3 = "Neither agree nor disagree"; 4 = "Agree"; 5 = "Strongly agree". The value of the Cronbach's alpha is 0.91.

Work engagement. This measure was evaluated through the Utrecht Work Engagement Scale (UWES-9) – Work and Well-Being Survey. This short version of the original scale includes 9 items integrated in the subscales vigor, absorption and dedication (Seppälä et al., 2009). The answer options were based on a 7-point Likert scale from 0 to 6 that is labeled as: 0 = "Never"; 1 = "Almost Never"; 2 = "Rarely"; 3 = "Sometimes"; 4 = "Often"; 5 = "Very Often"; 6 = "Always". The Cronbach's alpha value remains on 0.92.

***Open-mindedness*.** The Big Five Inventory-2 (BFI-2) was the scale used to study the open-mindedness variable, as part of the personality traits considered by the authors (Soto & John, 2017). Only this subscale of the instrument was considered relevant for this dissertation. The subscale was included in the questionnaire with its 12 items, measured in a 5-point Likert scale with the following meaning: 1 = "Disagree Strongly"; 2 = "Disagree a little"; 3 = "Neither agree or disagree"; 4 = "Agree a little"; 5 = "Agree Strongly". The items 1, 5, 6, 9, 10 and 11 were reverted. Afterwards, the items OM12 and OM11R were removed in order to improve the Cronbach's alpha, which final value stands on 0.73.

4. Research Hypotheses and Model of Analysis

H1: Gamification elements (such as points, badges and avatars) have a positive effect on training effectiveness

H2: There is a difference between training effectiveness for gamified trainings and training effectiveness for non-gamified trainings

H3: Training motivation mediates the relationship between gamification elements (such as points, badges and avatars) and training effectiveness

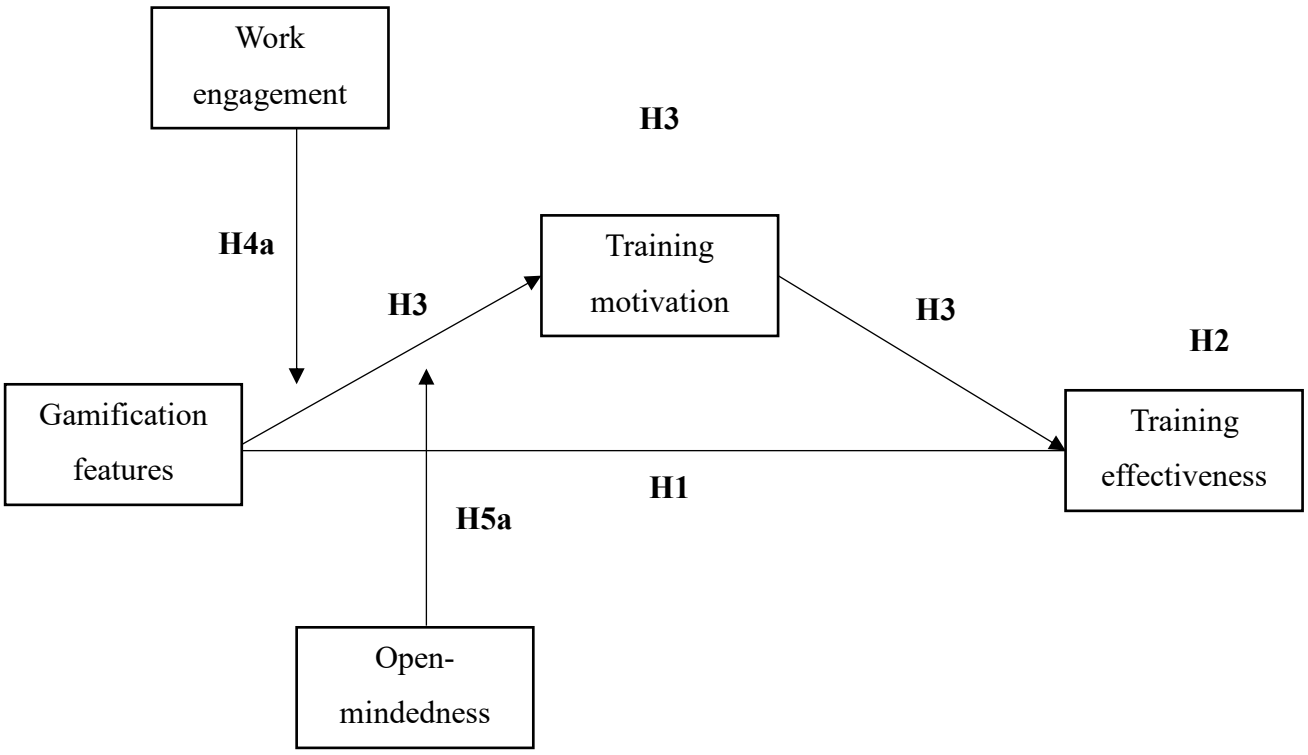
H4a: Work engagement moderates the relationship between gamification elements (such as points, badges and avatars) and training motivation

H4b: Work engagement moderates the relationship between gamification elements (such as points, badges and avatars) and the training effectiveness mediated by training motivation

H5a: Open-mindedness moderates the relationship between gamification elements (such as points, badges and avatars) and the training motivation

H5b: Open-mindedness moderates the relationship between gamification elements (such as points, badges and avatars) and the training effectiveness mediated by training motivation

Figure 2: Research model tested in the present research



CHAPTER III – RESULTS

1. Sample Description

The total number of respondents (128), in terms of gender, is characterized by a predominant number of female respondents (52.3%) than male (47.7%). Regarding the age, the values vary between 21 and 60 years old and the mean stands on the 35.7 years. The sample is distributed, concerning academic qualifications, in bachelor's degree (41.4%), master's degree (30.5%), high school (26.6%) and PhD (1.6%).

In terms of geographic distribution, there are participants from 11 countries - Angola, Australia, Brazil, China, France, Germany, Ireland, Pakistan, Portugal, Spain and Turkey. However, and especially due to the distribution within a Portuguese company, the sample is made of 83.6% of Portuguese employees. These employees are, in average, working for 8 years for their current employer and the values for seniority vary between 3 months and 40 years. Although all the members of the sample are working in a company, it is important to refer that 56.9% of the respondents work for the same company (Company A).

Concerning the gamified trainings, the number of sessions attended vary from 0 to 20 and the mean is equal to 3.32 sessions. The number of gamified training hours attended, in terms of duration, fluctuate between 0 and 200 hours, standing the mean on the 21.77 hours.

2. Descriptive Statistics and Correlations

The variables descriptive statistics were analyzed in terms of mean, standard deviation and correlation between the six variables studied. Furthermore, the Pearson's correlation coefficient (*r*) was used to measure the correlation between the variables. The interpretation of the *p*-value significance will have an important role on studying H1 and how the independent and dependent variables relate.

Table 2: Mean, standard deviation and correlations between variables

Variables	Mean	Std. Dev.	1	2	3	4	5	6
TE	3.34	0.47	***(0.92)***					
TEFa	2.93	0.62	0.39**	***(0.95)***				
USE	5.74	0.85	0.52**	0.09	***(0.96)***			
TM	4.55	0.47	0.58**	0.24**	0.41**	***(0.91)***		
WE	4.43	1.02	0.36**	0.26**	0.27**	0.33**	***(0.92)***	
OM	3.10	0.45	0.10	0.19*	0.42	0.46	0.28**	***(0.73)***

TE = Training effectiveness for gamified trainings; TEFa = Training effectiveness for non-gamified trainings; USE = User experience satisfaction; TM = Training motivation; WE = Work engagement; OM = Open-mindedness
Note: The Cronbach's Alpha value is in bold, italic and between brackets.
*Correlation is significant at the 0.05 level
**Correlation is significant at the 0.01 level

The variables training effectiveness (for gamified and non-gamified trainings) have a mean value above the scale mean (3.34 and 2.93, respectively). These variables show different values for standard deviation, standing the highest on the 0.62 (for non-gamified trainings) and the lowest on 0.47 (for gamified trainings). Concerning user satisfaction experience, the variable's mean is the highest of the table (5.74) standing much higher than its scale's mean, and a standard deviation of 0.85. Regarding training motivation, the mean stands on the 4.55 which is a considerable value, and a standard deviation of 0.47. In terms of work engagement, the mean is 4.43 and the standard deviation corresponds to 1.02, which is the highest of the whole table. Last but not the least, open-mindedness has a mean of 3.10, the lowest mean of the table but still above its scale's mean. Moreover, the standard deviation value for this variable stands on the 0.45 points.

The correlation values are positive and moderated, in general, showing mostly statistical significance at the *p*-value of 0.01. Almost all the variables are strongly self-correlated ($r > 0.9$, $p < 0.01$), and only a few relations show weak positive correlations. None of the correlations values were then identified as negative or null.

The highest correlation values are between training effectiveness for gamified trainings both with training motivation ($r = 0.58$, $p < 0.01$) and with user experience satisfaction ($r = 0.52$, $p < 0.01$). The lowest correlation value of the whole table involves the relation between the variable user experience satisfaction and training effectiveness for non-gamified trainings ($r = 0.09$, $p < 0.01$), which was already expected. Additionally, open-mindedness shows also low correlation with training effectiveness for gamified trainings ($r = 0.10$, $p < 0.01$) and training effectiveness for non-gamified trainings ($r = 0.19$, $p < 0.01$).

Looking at the studied dependent variable values, training effectiveness correlates strongly especially with training motivation ($r = 0.58$, $p < 0.01$) and user experience satisfaction ($r = 0.52$, $p < 0.01$), which are in fact the core predictors in the present research model. This last result already predicts that H1 might not be rejected, since a higher level of user experience satisfaction will increase the training effectiveness level for gamified trainings.

From now on, the training effectiveness (for non-gamified trainings) variable will not be considered in a great scale, since the research model is meant to analyze trainings that include gamification scenarios. Thus, the variable training effectiveness (for gamified trainings) will be simply called as training effectiveness. Although, to distinguish both training effectiveness variables, a comparison between the different means will be performed furthermore.

The relation between all the other variables needs although to be studied in terms of moderation, mediation and moderated-mediation effects.

3. Test of Hypotheses

To test the relation between the variables and how could these concepts be related with each other, the *t*-test for paired-samples and the PROCESS macro (Hayes, 2019) version 3.3 were used.

The comparison of means test will be used to study the Hypothesis 2 in order to understand if the difference between training effectiveness, for gamified and non-gamified trainings, is statistically significant.

The research model under analysis include a linear regression between the independent variable (user experience satisfaction - USE) and the dependent variable (training effectiveness - TE) that need to be tested – Hypothesis 1. The effect of the possible mediator considered in this relationship (training motivation - TM) is analyzed (Hypothesis 3) and, furthermore, the moderators work engagement (WE) and open-mindedness (OM) were included as simple moderators (Hypotheses 4a and 5a) and as conditioners for the indirect effect (Hypotheses 4b and 5b).

To run this analysis, the chosen PROCESS model templates were the model 4, to study the mediation effect, and the model 7, which will be run twice since there are two moderators and there is a need to study separately each predictor's effect in the variable relations. The model 4 was chosen because, different from the model 7, it allows to see the total effect of the independent in the dependent variable (path c).

3.1. The difference between the means of training effectiveness for gamified trainings and training effectiveness for non-gamified trainings analysis

The variable training effectiveness was measured twice, for the same sample, in order to study the difference between gamified trainings and non-gamified trainings (H2). To test if this difference is statistically significant, the *t*-test for paired-samples was run, assuming a normal distribution and homogeneous variances.

Table 3: Results of paired-samples *t*-test for mean difference between training effectiveness for gamified trainings (TE) and training effectiveness for non-gamified trainings (TEFa)

Means difference	Mean	SD	SE	Lower CI	Upper CI	*t*	df	*p*
TE & TEFa	0.4173	0.6193	0.0554	0.3077	0.5269	7.534	124	0.000

N=125; all missing values are excluded; *t*-test for paired-samples to compare means

The results of this analysis ($t_{(124)} = 7.534$, $p < 0.05$, CI from 0.3077 to 0.5269), shown in Table 3 provide significance to the difference between the two means. This conclusion can be taken from the fact that the *p*-value is lower than 0.05, which is the established value. Also, the statistical value of the *t*-test ($t_{(124)} = 7.534$) is quite higher when compared with the critical value defined for 120 degrees of freedom (1.658). Furthermore, the null value is not included in the 95% confidence intervals.

The training effectiveness mean is significantly different between gamified (3.3413) and non-gamified trainings (2.9240) as per the previous analysis, meaning that the Hypothesis 2 should not be rejected.

3.2. The mediation analysis for training motivation

The model 4 of the PROCESS macro (Hayes) allows to study mediation and, in this particular case, what might be the training motivation (TM) role in the relationship between user experience satisfaction (USE) and training effectiveness (TE). To analyze this possible mediated effect, and also the direct effect between USE and TE, the following statistical representation was considered:

Figure 3: Statistical representation of the mediated effect of TM between USE and TE

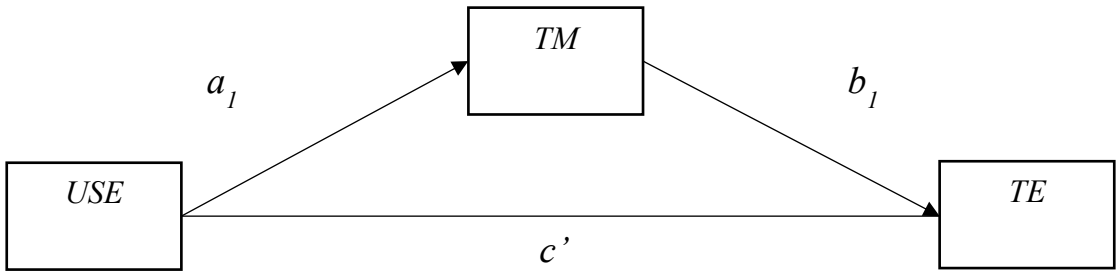


Table 4: Results of mediation analysis of training motivation (TM) in the relationship between user experience satisfaction (USE) and training effectiveness (TE)

Mediation	b	SE	*t*	*p*	Lower CI	Upper CI
USE → TM (a_1)	0.1793	0.0487	3.6833	0.0003	0.0829	0.2756
TM → TE (b_1)	0.4335	0.0739	5.8688	0.0000	0.2873	0.5797
USE → TE (c)	0.2843	0.0424	6.7063	0.0000	0.2004	0.3682
USE → TE (c')	0.1844	0.0413	4.4646	0.0000	0.1026	0.2661
USE → TM → TE (a_1*b_1)	0.0999	0.0292	-	-	0.0555	0.1691

N=126; all missing values are excluded; model 4 of SPSS PROCESS macro (Hayes, 2019)

Through the mediation analysis, it was possible to confirm, as shown in the Table 4, the significance of the overall model (path c) [$F_{(2,123)} = 45.77$, $p < 0.001$, $R^2 = 0.43$]. These results mean that the total effect of USE on TE, without considering the mediator, is indeed significant (b = 0.2843, $t_{(124)} = 6.7063$, $p < 0.001$). The Hypothesis 1 should not then be rejected.

The results presented also rely on the fact that USE has a positive and significant effect on TM, explained by the path a_1 (b = 0.1793, $t_{(122)} = 3.6833$, $p < 0.001$). Moreover, the relation between the mediator (TM) and the dependent variable (TE) was found to be significant as well (b = 0.4335, $t_{(122)} = 5.8688$, $p < 0.001$) – path b_1.

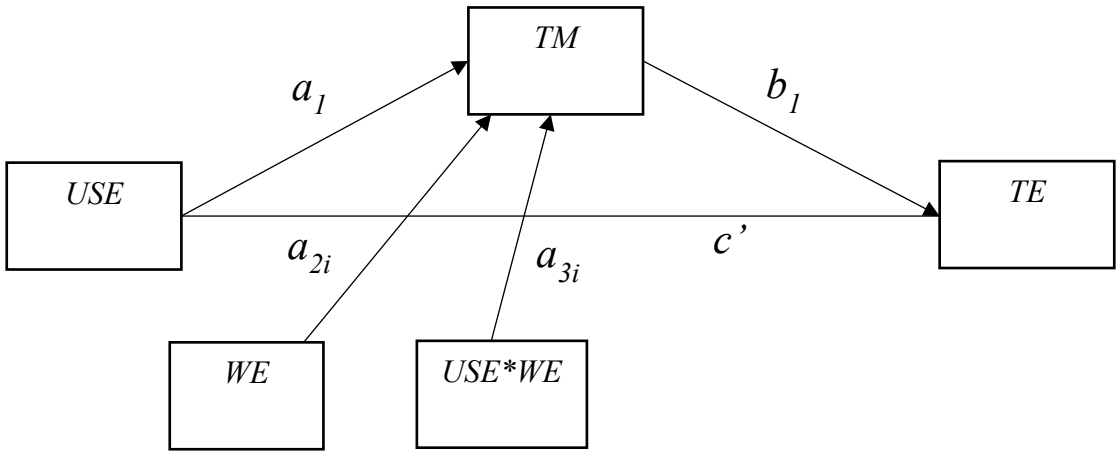
Introducing the variable TM as a mediator, the effect of USE on TE (path c') remains significant (b = 0.1844, $t_{(123)} = 4.4646$, $p < 0.001$). Furthermore, looking at the indirect effect produced on TE by USE through TM using the bootstrapping with 95% of confidence, it is shown as statistically significant (b = 0.0777, SE = 0.0254, CI from 0.0395 to 0.1377). This conclusion can be drawn since the null value is not included in the confidence intervals range, meaning zero is not a possible value for the path a_1*b_1.

The mediation of training motivation (TM) in the relationship between user experience satisfaction (USE) and training effectiveness (TE) is then confirmed, which is consistent with the proposed Hypothesis 3 that should not be rejected.

3.3. The moderated mediation analysis for work engagement

Afterwards, and to study the moderated mediation effects, the model 7 of the PROCESS macro was run. In order to analyze the possible moderation effect of work engagement (WE), the following statistical representation was used:

Figure 4: Statistical representation of the moderation effect of WE in the relationship between USE and TM



By running this analysis, it is possible to evaluate work engagement as a simple moderator in the relationship between user experience satisfaction and training motivation (Hypothesis 4a). Additionally, the moderator role of work engagement (WE) will be considered in the relationship between user experience satisfaction (USE) and training effectiveness (TE), taking in consideration the mediation effect of training motivation (TM), as described in the Hypothesis 4b.

Table 5: Results of moderated mediation analysis of Work engagement (WE) in the relationship between User experience satisfaction (USE) and Training motivation (TM)

Moderated Mediation	b	SE	*t*	*p*	Lower CI	Upper CI
USE → TM (a_1)	0.1793	0.0487	3.6833	0.0003	0.0829	0.2756
WE → TM (a_{2i})	0.1105	0.0381	2.8999	0.0044	0.0351	0.1859
USE*WE → TM (a_{3i})	-0.0435	0.0441	-0.9859	0.3261	-0.1309	0.0139
USE → TE (c')	0.1844	0.0413	4.4646	0.0000	0.1026	0.2661
USE → TM → TE (a_1*b_1)	0.0777	0.0254	-	-	0.0395	0.1377
Conditional effect for low WE	0.0970	0.0357	-	-	0.0478	0.1856
Conditional effect for medium WE	0.0777	0.0254	-	-	0.0395	0.1377
Conditional effect for high WE	0.0584	0.0277	-	-	0.0079	0.1171
Index of moderated mediation	-0.0189	0.0190	-	-	-0.0616	0.0137

N=126; all missing values are excluded; model 7 of SPSS PROCESS macro (Hayes, 2019)

The linear effect between user experience satisfaction (USE) and training motivation (TM), described in the path a_1, is already known as significant (b = 0.1793, $t_{(122)}$ = 3.6833, $p < 0.001$). Looking at the variable that is expected to produce some positive effect on this relation (path a_{2i}), the statistical significance also shows up (b = 0.1105, $t_{(122)}$ = 12.0984, $p < 0.01$). Additionally, the interaction between USE and WE will demonstrate if the moderator is in fact able to change the overall relationship. Explained by the path a_{3i}, the results (b = -0.0435, $t_{(122)}$ = -0.9859, p = 0.3261) leads to conclude that this effect is not statistically significant.

Consequently, the Hypothesis 4a has not enough statistical evidence to be supported and needs to be rejected.

Furthermore, it was tested the conditional effect of work engagement (WE) on the relationship between user experience satisfaction (USE) and training effectiveness (TE) through training motivation (TM), i.e. the moderated mediation.

The direct effect of user experience satisfaction (USE) on training effectiveness (TE) was already proved significant by the path c' (b = 0.1844, $t_{(123)} = 4.4646$, $p < 0.001$). The mediation promoted by training motivation (TM) in the previous relationship provided also results with significance for the statistics (b = 0.0777, SE = 0.0254, CI from 0.0395 to 0.1377). After introducing the moderator work engagement (WE), the overall model remains significant ($F_{(2,123)} = 45.7728$, $p < 0.001$, $R^2 = 0.4267$).

Moreover, this inclusion seems to be statistically significant at various levels of the moderator. To evaluate this, the means were centered, and three levels of the moderator within the indirect effect model were analyzed – WE in the mean, 1SD below the mean and 1SD above the mean. The outcomes show significance for low levels (b = 0.0970, SE = 0.0357; CI from 0.0478 to 0.1856), average (b = 0.0777, SE = 0.0254, CI from 0.0395 to 0.1377) and for high values of the moderator (b = 0.0584, SE = 0.0277, CI from 0.0079 to 0.1171). All the three conditioned indirect effects are significant since the zero value is not included in the confidence intervals provided by bootstrapping at 95% of confidence.

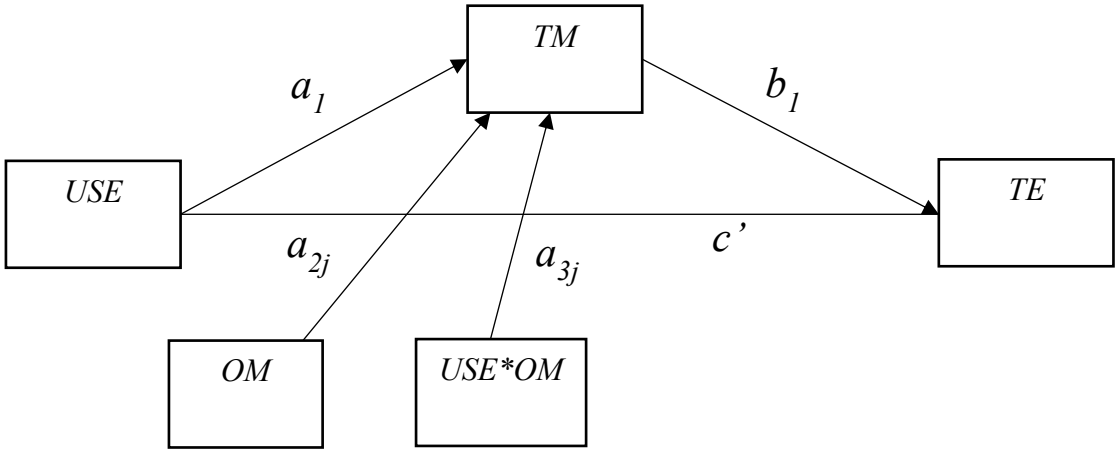
By testing the index of moderated mediation, the difference between the conditional indirect effects and if they are different from the direct effect (path c') can be analyzed. In this case, the results (b = -0.0189, SE = 0.0190, CI from -0.0616 to 0.0137) corroborate the idea that there is no moderated mediation from the moderator work engagement (WE) in the given research model. This result was already expected, since there was no simple moderation.

The previous analysis result in a rejection of the Hypothesis 4b, meaning that work engagement (WE) is not able to influence the relationship between user experience satisfaction (USE) and training effectiveness (TE) mediated by training motivation (TM).

3.4. The moderated mediation analysis for Open-mindedness

In order to evaluate if the other moderator (open-mindedness - OM) is changing the relationship between user experience satisfaction (USE) and training motivation (TM), the following statistical representation should be considered:

Figure 5: Statistical representation of the moderation effect of OM in the relationship between USE and TM



Following the same approach, and in order to validate if the Hypothesis 5a can be confirmed, open-mindedness (OM) will be studied as a simple moderator in the relationship between the independent variable and the mediator considered. Also, this moderator will be included in the indirect effect of user experience satisfaction (USE) on training effectiveness (TE) via training motivation (TM), allowing the test of the Hypothesis 5b.

Table 6: Results of moderated mediation analysis of open-mindedness (OM) in the relationship between user experience satisfaction (USE) and training motivation (TM)

Moderated Mediation	b	SE	*t*	*p*	Lower CI	Upper CI
USE → TM (a_1)	0.2298	0.0462	4.9790	0.0000	0.1385	0.3212
OM → TM (a_{2j})	0.0241	0.0879	0.2747	0.7840	-0.1498	0.1981
USE*OM → TM (a_{3j})	0.0072	0.1024	0.0705	0.9439	-0.1955	0.2099
USE → TM → TE (a1*b1)	0.0996	0.0287	-	-	0.0545	0.1664
Conditional effect for low OM	0.0982	0.0386	-	-	0.0321	0.1828
Conditional effect for medium OM	0.0996	0.0287	-	-	0.0545	0.1664
Conditional effect for high OM	0.1010	0.0321	-	-	0.0545	0.1758
Index of moderated mediation	0.0031	0.0464	-	-	-0.0938	0.0955

N=126; all missing values are excluded; model 7 of SPSS PROCESS macro (Hayes, 2019)

As per previous confirmation, there is significance in the statistical relation between user experience satisfaction (USE) and training motivation (TM) (b = 0.1793, $t_{(122)}$ = 3.6833, p < 0.001). Regarding the moderator measured, it does not seem to produce some effect on training motivation (TM) – path a_{2j} (b = 0.0241, $t_{(122)}$ = 0.2747, p = 0.7840). Looking at the interaction between the moderator and the independent variable, and as expected, no moderation seems to occur – path a_{3j} (b = 0.0072, $t_{(122)}$ = 0.0705, p = 0.9439). By the latest result, the Hypothesis 5a needs to be rejected, disregarding the moderation role of open-mindedness (OM) in the relationship between user experience satisfaction (USE) and training motivation (TM).

In order to test the conditional indirect effect of open-mindedness (OM) on the relationship between user experience satisfaction (USE) and training effectiveness (TE) through training motivation (TM), the moderated mediation analysis needs to be run.

The significance found on the direct relation of user experience satisfaction (USE) and training effectiveness (TE) (b = 0.1844, $t_{(123)}$ = 4.4646, $p < 0.001$) and its mediation effect through training motivation (TM) (b = 0.0777, SE = 0.0254, CI from 0.0395 to 0.1377) enable to insert a moderator in the analysis. As soon as the moderator is inserted, the full moderated mediation model persists significant ($F_{(2,123)}$ = 45.7728, $p < 0.001$, R^2 = 0.4267).

In addition, the moderator insertion is likely to be significant at the low, average and high levels considered. The results bring significance 1 SD below the mean (b = 0.0982, SE = 0.0386, CI from 0.0321 to 0.1828), on the average (b = 0.0996, SE = 0.0287, CI from 0.0545 to 0.1664) and 1SD above the mean (b = 0.1010, SE = 0.0321, CI from 0.0511 to 0.1758). In these scenarios, zero is not a valid or probable value for the moderator's effect and thus the moderated mediation seems to occur.

Although, the conditional indirect effects for the different levels of the moderator are very similar between each other (b = 0.0982; b = 0.0996; b = 0.1010). This can lead to draw the conclusion that, whatever is the open-mindedness value, the effect of user experience satisfaction (USE) on training effectiveness (TE) through the mediator will be similar. To take the doubts, the index of moderated mediation can be analyzed afterwards. The outcome of this index (b = 0.0031, SE = 0.0464, CI from -0.0938 to 0.0955) inform that there is not indeed a moderated mediation in the research model provided above for the variable open-mindedness (OM). The Hypothesis 5b should be rejected.

CHAPTER IV - DISCUSSION

1. Theoretical Implications

The goal of this study was to understand the relationship between the inclusion of gamification features in learning contexts and training effectiveness, including a comparison with more conventional methodologies. The literature has not been able to find a common understanding of the gamified approach, and the practical usage has been growing on a broader scale than the theoretical understandings (Dichev & Dicheva, 2017; Gupta & Gomathi, 2017). This study allowed researchers to evaluate the user experience satisfaction, where workers have shared how they felt experiencing the game features while taking the training. Although most of the literature reviewed tends to favor gamification rather than traditional practices, there is not still strong evidence to confirm that game features enhance learning transference and training effectiveness.

The gamification topic has not indeed reached a consensus among the researchers and some of them (Armstrong & Landers, 2018; Faiella & Ricciardi, 2015) believe that if the new gamified approach is not applied properly, motivational levels may be negatively affected.

This study has confirmed, in line with most of the previous literature (Çeker & Özdamli, 2017; Dichev & Dicheva, 2017), that there is a significant difference in training effectiveness when combined with gamified and non-gamified trainings sessions ($t_{(124)} = 7.534 > 1.658$). This result confirms the theories developed by some authors (Dichev & Dicheva, 2017; Faiella & Ricciardi, 2015) in which gamified training is significantly different than non-gamified training in terms of training effectiveness. Also, as expected, user experience satisfaction related positively and in a strong way with training effectiveness ($r = 0.52$, $p < 0.01$). Therefore, when gamified methodologies are incorporated in the training environment and trainees are enjoying it, better training outcomes will appear, corroborating the authors' statements.

In addition to training effectiveness, the training motivation variable was included, since most of the literature seeks prove its importance on producing satisfactory training outcomes (Mielniczuk & Laguna, 2017; Zaniboni et al., 2011). This research connects these three ideas – the user experience satisfaction with the gamification features, the training motivation and its effectiveness.

By introducing the motivation for the training as a mediator of the relationship between user experience satisfaction and training effectiveness, it is evident that this relationship requires the trainees' motivation to occur appropriately as confirmed by the statistical significance (b = 0.1844, $t_{(123)} = 4.4646$, $p < 0.001$).

According to the authors (Faiella & Ricciardi, 2015), gamification elements such as rewards, points and badges, can produce some effect on extrinsic motivation and, therefore, affect the intrinsic motivation of the participants. In this case, and since this sample is quite small, it is not evident that gamification can always be a good approach to learning activities, since the outcomes will always depend on the audience (the trainees) and the game elements used for the purpose. Also, the gamification features chosen might have a completely different effect on the participant's behaviors, depending on their motivators for the training.

Some research have shown that, even though the short run effects of gamification can lead to positive learning outcomes, the engagement to new approaches might decrease along the way and new practices should be investigated in the meantime (Faiella & Ricciardi, 2015). A long-term perspective should always be taken into consideration when designing and applying gamification approaches into the learning environments in order to avoid a drop in engagement level. To eliminate this limitation, instructional designers should adopt a wide variety of gamification elements and techniques. This will ensure that all the attendees will take advantage of the training in some way (Dichev & Dicheva, 2017; Faiella & Ricciardi, 2015).

Based on the present literature review, some authors have already examined the personal characteristics influencing the motivation for the training (Bauer et al., 2016; Thompson, 2013; Zaniboni et al., 2011). During their studies, the characteristics of open-mindedness and work engagement were included in an effort to evaluate the moderation effect both at the individual level as well as in his/her connection with the organization. Per the results in the present research, both work engagement (b = -0.0435, $t_{(122)} = -0.9859$, $p = 0.3261$) and open-mindedness (b = 0.0241, $t_{(122)} = 0.2747$, $p = 0.7840$) lack statistical evidence and thus do not seem to play a moderator role in the relationship between user experience satisfaction and training motivation. The high *p*-value for open-mindedness is consistent with the low correlation value with training effectiveness for gamified trainings ($r = 0.10$, $p < 0.01$), which already brought low expectations for this relationship to be strong. Additionally, neither work engagement (b = -0.0189, SE = 0.0190, CI from -0.0616 to 0.0137) nor Open-mindedness (b =

0.0031, SE = 0.0464, CI from -0.0938 to 0.0955) seem to be significant in the conditional indirect effect differences, meaning that there is no moderated mediation for both variables.

These results, divergent from the expectations in the beginning, can be explained through the majority of the sample being constituted by people from the same country and company. This can lead to some homogeneity of behavior in the answers that could have reduced the chance to obtain some more favorable conclusions. In that sense, further research is still needed to evaluate these constructs and how can they play a moderator role in the relationship between gamification and training motivation, recurring to a more heterogeneous sample.

2. Practical Implications

For organizational purposes, it is of high importance to understand an employees' engagement levels and how are they changing throughout time (Bakker & Albrecht, 2018). Moreover, Human Resource personnel have been concerned how their practices measure and influence work engagement levels in the workplace. Per the authors (Bakker & Albrecht, 2018) the solution continues to incorporate these engagement in the companies' HR policies and practices, such as selection, performance management and training and development.

As shown in the present and previous researches, training motivation is an essential element to predict training effectiveness. Thus, organizations should be focused on keeping their employees highly engaged, especially when it comes to training purposes, as the main subject of this research.

Training and development is one of the main concerns within the business world, due to their capacity to influence employees in a variety of ways, such as enhance their skills and competencies (Armstrong & Landers, 2018; Mielniczuk & Laguna, 2017). Thus, there is a continuous need to investigate alternative methodologies that can fit the employees' needs and expectations in an effort to keep them motivated, involved and able to participate in effective learning events. These training events, when successfully built, promote the competence acquisition, personal and professional development that allow employees to perform to the best of their ability.

Over the last few years, companies have created plans to invest in gamification to enhance their business activities considerably (Gupta & Gomathi, 2017). Thus, as previous studies

(Armstrong & Landers, 2018; Dichev & Dicheva, 2017; Gupta & Gomathi, 2017) and the present one have stated, gamification has proven to be effective in helping influence virtuous training methods. Incorporating game elements into training environments seem to catch employees' attention, due to their positive perception of user experience. In general, it is quite evident, as expressed in this research, that training sessions are more effective when the positive user experience levels are higher. Therefore, including game design elements, such as points, badges, levels, avatars into the "classroom" can strengthen the trainees' motivation for the training.

Nevertheless, it is not entirely safe to assume that in implementing a gamification methodology, the results will be favorable. As mentioned before, some authors (Armstrong & Landers, 2018; Faiella & Ricciardi, 2015) have forewarned trainers about the possibility of hurting intrinsic motivation when introducing game elements into the training context. For Armstrong & Landers (2018), gamification only brings effectiveness when combined with instructional design principles, since only incorporating the game elements can hurt motivation and training outcomes. Therefore, Human Resource managers need to study their audience (the workers that will receive the training) and instructional designers must pick the proper approaches. This decision involves features and characteristics that will make participants feel engaged, motivated to learn and not focused only on competition or any other extrinsic sources of motivation. The adequate involvement of the HR department into training and development practices and the correct set of characteristics will promote a training that will be relevant for the associate, their team performance and the organizational progression.

3. Limitations and Future Research

Not many companies are currently using gamification applications for their training activities. In this research, for instance, only around 10% of the people that answered to the first contact have said that he/she knew someone, or a company, that was using this approach. The subjects surveyed, across a variety of companies, shared how this method is still in its beginning stages within our country. The lack of gamification usage as apart of training in the current workforce, in both Portugal and internationally, caused complications in the research as it did not allow for enough evidence to support its findings.

Also, since the target group was not only Portuguese people, most of the people ignored their LinkedIn inbox because a first contact was not already stablished, bringing even more lack of answers. Thus, a greater sample was hard to be achieved since all the respondents should have previously participated in a similar kind of gamified training practice. Additionally, the company should have agreed if the aim was to share the survey internally.

From the number of people that have returned with an answer (around 40%), only 22% have given a positive answer about companies or people involved in the subject. Although, some of them stated that, despite having a great will to help, the company's legal restrictions did not allow them to share questionnaires or approach the employees for the present objective.

The final sample brought 128 valid answers and around 57% were from people that belonged to the same company (Company A). This specific retail company uses the same gamification tools and applications for all the departments and teams. This means that more than half of the sample were answering based on similar gamification experiences, bringing a lack of diversity and narrow perspectives on the gamification elements and scenarios.

Finally, most of the employees contacted were working in Portugal, specifically within the company where the questionnaire was distributed. Looking at the final sample, around 84% were working in Portugal which also restrict the conclusions that were drawn. This is because people from the same country have more similarities in terms of cultural values, experiences and work environment which brings a small variety within the sample.

The variables of the study are limited if the aim is to get more in depth within each construct. Regarding the gamification elements, for example, their impacts on the training motivation and on the training effectiveness will vary based on the elements used (Dichev & Dicheva, 2017; Faiella & Ricciardi, 2015; Landers, 2014). In this case, in the future, it would be reasonable to study the impacts of the different elements, isolated and combined, to analyze how they can influence the motivation for the training and its effectiveness in the long run.

Concerning the motivation for the training, the different types of motivation (intrinsic and extrinsic) are impacted in different ways depending on the game elements used. As the authors stated (Faiella & Ricciardi, 2015) some elements can hurt intrinsic motivation levels, bringing up other sources of motivation such as the competition and other external motivators. This

finding is serious and needs to be clarified by other researchers in order to define if there are some elements, or combinations of elements, that will not be useful for the participants.

When talking about training effectiveness, it is not easy to evaluate how relevant a specific training approach for the employees. Learning transference evaluation needs to be measured in a wide timeframe, such as the before, during and the after phases of a training in order to evaluate employee's performance and expectations. In this regard, the thesis timeframe constitutes a limitation.

Additionally, even though all the used scales were already validated by several authors, the different variety of the scales used can influence the answers of the respondents. The fact that the range changes across the questionnaire is not ideal and requires some focus of the participants that is deviated from the main emphasis.

For the future, it is of high importance to keep investigating how current frameworks and theories apply to the emerging work contexts, such as gamification and virtual working scenarios (Bakker & Albrecht, 2018). Additionally, some research needs to be developed regarding what specific groups, such as the new generations in the workplace, are expecting and how they will react to these new techniques (Bakker & Albrecht, 2018). For that aim, the predictors for their own engagement should be studied and measured in order to tailor the HR practices accordingly.

CHAPTER V – CONCLUSIONS

The emphasis on training practices as one of the most Human Resource concerns within organizations drives the demand to maximize the training outcomes. This can most effectively be done by involving the workforce and using the most relevant methodologies (Armstrong & Landers, 2018; Blume et al., 2010; Mielniczuk & Laguna, 2017).

Gamification, as one of the most recently used approaches for many human resource processes, such as training, allows to the department to reframe failure as a necessary step to achieve educational goals (Armstrong & Landers, 2018; Faiella & Ricciardi, 2015; Gupta & Gomathi, 2017). There is not an official consensus among researchers and gamification specialists, although the agreement stands on the fact that the gamified approaches should be as customized as possible according to the participants needs and expectations (Faiella & Ricciardi, 2015). Some elements or techniques might produce different impacts among and within groups and this point should be taken into consideration before deciding on how to approach trainees. In regards to this research, it was possible to strengthen the idea that training effectiveness differs when comparing gamified and not-gamified trainings.

Additionally, the participants' motivational levels, and the way they see the training, will definitely play an important role. This means that HR managers and instructional designers should keep them in mind when preparing and delivering training activities via gamified applications.

In line with previous studies, the present investigation has corroborated the idea that when gamification features are included, tested via user experience satisfaction in this case, there is strong correlation with training effectiveness. Furthermore, training motivation is required for the previous relationship to occur although it is a sensible topic. On the other hand, the homogeneity of the sample might block the possibility to prove that some personal factors (such as work engagement and open-Mindedness) could influence the whole scenario.

In conclusion, the technological mindset of the modern learner looks like a competitive advantage for organizations. Gamification-based training experiences as a new learning approach seem to have potential to bring high levels of training effectiveness for the company's workforce This allows for competence acquisition and therefore organizational success in the market.

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APPENDIX

Questionnaire (English Version)

The Gamification Usage in Training Sessions

The inclusion of game elements in contexts that are not meant for entertainment has been increasing in the past years. These game design elements (such as points, levels, badges, leaderboards and avatars), when used somehow in non-game environments allow to create gamification scenarios.

My name is Duarte Caixado and, as a Master student in Human Resources Management and Organizational Consultancy in ISCTE, I am conducting this research within my master thesis.

The questions are asked only for academic purposes and the answers will be treated anonymously without personal or organizational names involved. There are no right or wrong answers, so please select the option that comes to our mind first.

For a better experience, if you're using your smartphone to fill in the survey, please turn it horizontally when needed.

If you have some questions in the meanwhile, please feel free to ask: duartemcaixado@gmail.com

(+351 927 893 397)

Thank you in advance for your collaboration!

Looking at the gamification defined previously, have you participated in a gamified training session?

☐ Yes (some elements, such as points, badges, levels, leaderboards or avatars were in my training)
☐ No

Please select the game elements that were used (you had contact with) during your training:

☐ Points
☐ Badges (such as medals, tokens, stamps, stars)
☐ Leaderboards
☐ Levels (or progress information)
☐ Avatars (characters)
☐ Other: _____

Thinking about those gamification elements and your user experience, please indicate how much do you agree with the following statements:

	1	2	3	4	5	6	7
I think it is easy to learn how to play the game.	☐	☐	☐	☐	☐	☐	☐
I find the controls of the game to be straightforward.	☐	☐	☐	☐	☐	☐	☐
I always know how to achieve my goals/objectives in the game.	☐	☐	☐	☐	☐	☐	☐
I find the game's interface to be easy to navigate.	☐	☐	☐	☐	☐	☐	☐
I do not need to go through a lengthy tutorial or read a manual to play the game.	☐	☐	☐	☐	☐	☐	☐
I find the game's menus to be user friendly.	☐	☐	☐	☐	☐	☐	☐
I feel the game trains me well in all of the controls.	☐	☐	☐	☐	☐	☐	☐
I always know my next goal when I finish an event in the game.	☐	☐	☐	☐	☐	☐	☐
I feel the game provides me the necessary information to accomplish a goal within the game.	☐	☐	☐	☐	☐	☐	☐
I think the information provided in the game (e.g., onscreen messages, help) is clear.	☐	☐	☐	☐	☐	☐	☐
I feel very confident while playing the game.	☐	☐	☐	☐	☐	☐	☐
I think the game is fun	☐	☐	☐	☐	☐	☐	☐
I enjoy playing the game	☐	☐	☐	☐	☐	☐	☐
I feel bored while playing the game	☐	☐	☐	☐	☐	☐	☐
I am likely to recommend this game to others	☐	☐	☐	☐	☐	☐	☐
If given the chance, I want to play this game again	☐	☐	☐	☐	☐	☐	☐
I am in suspense about whether I will succeed in the game.	☐	☐	☐	☐	☐	☐	☐
I feel successful when I overcome the obstacles in the game.	☐	☐	☐	☐	☐	☐	☐
I want to do as well as possible during the game.	☐	☐	☐	☐	☐	☐	☐
I am very focused on my own performance while playing the game.	☐	☐	☐	☐	☐	☐	☐
I feel the game constantly motivates me to proceed further to the next stage or level.	☐	☐	☐	☐	☐	☐	☐
I find my skills gradually improve through the course of overcoming the challenges in the game.	☐	☐	☐	☐	☐	☐	☐

Rating scale: 1 = "Strongly Disagree" to 7 = "Strongly Agree"

Here are a number of characteristics that you may identify with or not. Please indicate, for each, the extent to which you agree or disagree with the statement.

	1	2	3	4	5
Has few artistic interests	☐	☐	☐	☐	☐
Is curious about many different things	☐	☐	☐	☐	☐
Is inventive, finds clever ways to do things	☐	☐	☐	☐	☐
Is fascinated by art, music, or literature	☐	☐	☐	☐	☐
Avoids intellectual, philosophical discussions	☐	☐	☐	☐	☐
Has little creativity	☐	☐	☐	☐	☐
Values art and beauty	☐	☐	☐	☐	☐
Is complex, a deep thinker	☐	☐	☐	☐	☐
Has difficulty imagining things	☐	☐	☐	☐	☐
Thinks poetry and plays are boring	☐	☐	☐	☐	☐
Has little interest in abstract Ideas	☐	☐	☐	☐	☐
Is original, comes up with new Ideas	☐	☐	☐	☐	☐

Rating scale: 1 = "Disagree Strongly"; 2 = "Disagree a little"; 3 = "Neither agree or disagree"; 4 = "Agree a little"; 5 = "Agree Strongly"

The following 9 statements are about how you feel at work. Please read each statement carefully and decide if you ever feel this way about your job. You should indicate how often did you feel it by selecting the most adequate number (from 1 to 6).

	0	1	2	3	4	5	6
At my work, I feel that I am bursting with energy	☐	☐	☐	☐	☐	☐	☐
At my job, I feel strong and vigorous	☐	☐	☐	☐	☐	☐	☐
I am enthusiastic about my job	☐	☐	☐	☐	☐	☐	☐
My job inspires me	☐	☐	☐	☐	☐	☐	☐
When I get up in the morning, I feel like going to work	☐	☐	☐	☐	☐	☐	☐
I feel happy when I am working intensely	☐	☐	☐	☐	☐	☐	☐
I am proud of the work that I do	☐	☐	☐	☐	☐	☐	☐
I am immersed in my work	☐	☐	☐	☐	☐	☐	☐

I get carried away when I'm working	☐	☐	☐	☐	☐	☐	☐

Rating scale: 0 = "Never"; 1 = "Almost Never"; 2 = "Rarely"; 3 = "Sometimes"; 4 = "Often"; 5 = "Very Often"; 6 = "Always"

What do you think about training activities? Thinking of training sessions that you have been part of as a participant, please answer the following questions according to the rating scale:

	1	**2**	**3**	**4**	**5**
Attending training activities, I want to improve technical/practical knowledge in my job	☐	☐	☐	☐	☐
I feel that it is important to take part in training programs in order to strengthen my problem-solving skill	☐	☐	☐	☐	☐
I think it's important to learn new things from training activities	☐	☐	☐	☐	☐
I believe the training activity is useful for workers who occupy a job position similar to mine	☐	☐	☐	☐	☐
Usually I am able to apply to my job what I learn in training activities	☐	☐	☐	☐	☐
Acquiring new skills thanks to training activities, positively influences my performances	☐	☐	☐	☐	☐
If I am involved in training activities, I am confident I can master aspects of my job	☐	☐	☐	☐	☐
If I am involved in training activities, I am confident to learn the new knowledge taught in the training activities	☐	☐	☐	☐	☐
If I am involved in training activities, I am confident I can improve my ability of initiative	☐	☐	☐	☐	☐

1 = "Strongly Disagree"; 2 = "Disagree"; 3 = "Neither Agree or Disagree"; 4 = "Agree"; 5 = "Strongly Agree"

Thinking about a course you've attended with gamification elements present, please indicate to what degree you agree with each statement using this rating scale:

	1	**2**	**3**	**4**
The class environment helped me to learn	☐	☐	☐	☐
There were no major distractions that interfere with my learning	☐	☐	☐	☐
The training material will be helpful for my success in the future	☐	☐	☐	☐
I will be able to immediately use what I learned	☐	☐	☐	☐
I was well engaged to what was going on in the training	☐	☐	☐	☐
The activities aided in my learning	☐	☐	☐	☐

I was given adequate opportunities to demonstrate what I was learning	☐	☐	☐	☐
The training met my expectations	☐	☐	☐	☐
I am clear on how to apply what I learned on job	☐	☐	☐	☐
I would recommend this training to my coworkers	☐	☐	☐	☐

1 = "Strongly Disagree"; 2 = "Disagree"; 3 = "Agree"; 4 = "Strongly Agree"

Thinking about a course you've attended without any gamification elements present (such as a conventional classroom training), please indicate to what degree you agree with each statement using this rating scale:

	1	**2**	**3**	**4**
The class environment helped me to learn	☐	☐	☐	☐
There were no major distractions that interfere with my learning	☐	☐	☐	☐
The training material will be helpful for my success in the future	☐	☐	☐	☐
I will be able to immediately use what I learned	☐	☐	☐	☐
I was well engaged to what was going on in the training	☐	☐	☐	☐
The activities aided in my learning	☐	☐	☐	☐
I was given adequate opportunities to demonstrate what I was learning	☐	☐	☐	☐
The training met my expectations	☐	☐	☐	☐
I am clear on how to apply what I learned on job	☐	☐	☐	☐
I would recommend this training to my coworkers	☐	☐	☐	☐

1 = "Strongly Disagree"; 2 = "Disagree"; 3 = "Agree"; 4 = "Strongly Agree"

Demographic Information

Gender

□ Male
□ Female
□ Other

Age

Country

Academic Qualifications

□ High School
□ Bachelor Degree (BSc)
□ Master Degree (MSc)
□ Doctorate (PhD)
□ Other: _____

Working department

Position in the company

□ Associate
□ Team-Leader / Supervisor
□ Head of Department
□ Board of Management
□ Other: _____

Company's area of activity

Tenure in the company

Number of gamified trainings attended

More or less, how many hours have you spent on gamified trainings?
