

# Gamification as a Training Strategy and the Flow State

## A Case Study in an Information Technology Company in Southern Brazil

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### Abstract

By considering some of the main elements of games, this article aims to understand how the practical experience of gamification, which is proposed as a training strategy for collaborators to foster the knowledge on cloud computing solutions, in an information technology (TI) company in Southern Brazil, can contribute to enable flow states. With a case study, evidence shows that collaborators, when they live, experience, and perform the activities proposed, could make use of the possibilities offered by the gamification, such as feedback, meaning, interaction, fantasy, time pressure, rewards, scores, achievement, collaboration, reputation, competition, shadowing, conforming behaviour, leaderboards, thus potentiating the flow states. In the flow, establishing clear goals, concentration and immersion of the participant in the development of the challenges, missions, feeling of control of awareness and attitudes, feedback and balance between the abilities of the subject, and the challenges of the proposed activity.

### Introduction

Education, in the corporative level or in the formal context, faces tensions arising from the needs of training and education for a network society, the needs and expectation of the learning subjects, and the offers made by the institutions. These tensions are largely due to the inefficiency of traditional approaches in the design of offers for training and education, which involve methodologies, practices, and processes of pedagogical mediation as well as the means to make them real.

Standardized, massive, content-focused instructional offers, where subjects are mere spectators; which detach theory and practice, with theory being more prevalent than practice, which precedes it, in order to supposedly guarantee subsequent application; structuring a plan that ignores the context, the institutional needs, the specificities of different areas of knowledge, the characteristics of the audience targeted by the offer; a greater understanding of who the subject of the learning is, how the subject learns, which knowledge and skills the subject already has, the needs in terms of new knowledge, etc., have resulted in the failure of the education and training processes and consequently have contributed to maintaining the problems in both corporative and formal education.

A mismatch is seen between what current theories of learning and results of inter- and

transdisciplinary research indicate, and what is observed in the proposals for education and training. This can be due to new theories and research outcomes ignoring or failing to be meaningful. Considering this scenario, an Information Technology (IT) company in Southern Brazil has made approaches to research in education, especially regarding the Digital Education, in order to seek alternatives for their education and training offers, available as Distance Education (DE) courses.

The IT company studied is redefining their solutions. As a world strategy, the company decided to migrate the portfolio of client-server products to products working in the cloud, a new possibility envisioned by the organizations against the smaller investments in digital infrastructure, where data, software, and several tasks can be accessed through the Internet, promoting more flexibility in the offer of services with attractive costs [1,2].

The company created training offers to enhance the knowledge of the collaborators teams about this new concept and also to leverage the number of individual internal certifications of products in the cloud, aiming to accomplish the world strategy in their internal and external processes of service and sale to clients, enhancing the temporary competitive advantage of the company compared to their competitors. The design of these offers consists in a set of class videos that are made available in a digital environment for self-study. In the end of the course, the collaborator sits for an exam in order to gain a certification.

While following this process, the company identified that the information regarding a particular product was not being effectively appropriated, about the relationship between the time the collaborators dedicate to the training and their little motivation in watching the class videos and delivering the requirements to complete the training.

During an informal conversation with the Digital Education Research Group [Grupo de Pesquisa Educação Digital] - GPe-dU UNISINOS/CNPq<sup>1</sup>, on December 2013, the above problematics arises. At that time, GPe-dU<sup>2</sup> was just starting the research related to Gamification. The idea of creating a gamified layer to the existing training process came up, since redesigning the entire process already set by the company would lead to a longer and more expensive process. Instigated by this conversation, the company gathered a group of three collaborators, who were given the task of studying gamification and creating a proposition considering the idea above.

In September 2014, the company invited GPe-dU to carry out a research that would be connected to the experience, since the group is responsible for the Digital Education Seminar<sup>3</sup>, and to discuss this possibility between the participants. Soon after, a group is interested in following this experience, leading to write the present article.

Given the presented context, the premise is that gamified activities lead to engagement, immersion, cooperation of the participants to achieve certain goals, enhance the experience, and increase the level of interaction and participation [3,4,5]. Moreover, the training strategy developed has provided flow states. Flow is understood as a state where the subject is immersed in a particular activity, while developing energy, focus, and full involvement. It is an optimal experience process in which the subject feels simultaneously and cognitively efficient, motivated and happy while operating at full capacity [6]. Considering this, the objective of this article is: *to understand how the practical experience of gamification, applied as a collaborators training strategy to stimulate knowledge in solutions for cloud computing, of an information technology (IT) company in Southern Brazil, enables flow states.*

It is an exploratory-descriptive, qualitative research using as the primary method the case study. In the data production, there are direct observation, documents, and a script for a semi-structured interview with open questions. The content-based analysis, through data categorization, was chosen considering the main elements of games and the flow theory.

Subsequently, theoretical reference, case contextualization, methodology, data presentation and analysis, final consideration, and references are presented.

## Theoretical Background

### Gamification

Gamification proposes the use of game-like concepts and logic by using mechanical, dynamic and strategies game-like elements to solve problems and to trigger learning [3,7,5], in different areas [8]. Gamification does not imply a game that addresses the problem and re-creates the situation within a virtual digital world, but implies using strategies, methods, and concepts to solve problems found in virtual digital worlds in real world situations [9].

Gamification derives directly from the popularization and popularity of games and their intrinsic capacity to instigate actions, solve problems, and enhance learnings in different areas. Furthermore, games are naturally accepted by current generations who grew up interacting with this type of entertainment. Gamification is justified from a socio-cultural perspective and assumes the use of elements traditionally found in games, such as narrative, feedback system, rewards system, conflicts, cooperation, competition, objectives and clear rules, levels, trial and error, fun, interaction, interactivity, etc., in activities that are not directly associated with games, in order to reach the same degree of engagement and motivation that are usually found in players when interacting with good games [9].

The mechanics and dynamics of games are important elements related to gamification. The mechanics involves rules and benefits, that is, the aspects that make the game challenging, fun, rewarding, or other emotion expected by the designs of the games. These emotions result from desires and motivations and are called game dynamics [10]. They are responsible for the components of the game to work properly because they allow gamers to have full control over the game levels and to guide their actions. The dynamics is the interactions of the gamer with the mechanics of the game. They determine what each gamer is doing in response to the mechanics of the system in individual activities or with other gamers [7].

Thiebes et al. [11] carried out a study where they present a literature systematic review, identifying game elements used in gamification; there is a summary of mechanics and dynamics (M&D) of games organized in five categories: *system design, challenges, challenges, rewards, social influences and user specifics*. Table 1 presents categories and subcategories.

Table 1. Elements of Games

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*System Design*: how a gamified application must be conceived and developed in order to motivate.

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- Feedback**: used to keep the player aware of his progress or failures in real time [12].
  - Audible Feedback**: Implementing sound effects and/or background music [13].
  - Reminder**: Reminder of past behaviour of the user, e.g., a history of actions [14].
  - Meaning**: “[...] For a meaningful gamification, it is important to consider the background that the user brings to the activity and the organizational context where the specific activity is placed. [...] The game elements need to come out of aspects of the underlying activity that are meaningful to the user” [15, p. 2-5].
  - Interaction concepts**: “This includes an attractive user interface with stimulating visuals and exciting interaction concepts, as well as a high degree of usability” [16, p. 105].
  - Visually resembling existing games**: Creating a visual design, which is similar to existing games. For example, designing the system similar to the well-known Tetris game [17, p. 315].
  - Fantasy**: "evokes images of objects or situations that are not actually present. This can make the
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experience more emotionally appealing to the users” [13, p. 105].

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*Challenges:* trying to motivate the users, generating challenges and creating clear goals.

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- Goals:** should be adapted as challenges for the user [12].

- Time pressure:** through counters or hourglasses [13].

- Progressive disclosure:** "A game helps players to continuously increase their skills by progressive disclosure of both knowledge and challenge [...]. This will help ensure that the challenges in the game match the player’s skill levels [...]" [13, p. 105].

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*Rewards:* motivating the users while giving rewards (point systems or attribution of *badges*) after certain action are successful.

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- Ownership:** "represents a positive, sustained connection to an entity that leads to a feeling of shared ownership" [18, p. 14].

- Achievement:** A reward for completing a clear and desirable goal [14].

- Point system:** Rewards users for completing actions, whereby a numeric value is added to their overall point total [18].

- Badges:** “[...] consist of optional rewards and goals whose fulfilment is stored outside the scope of the core activities of a service” [19, p. 2].

- Bonus:** rewards for one having completed a series of challenges or core functions [18].

- Loss aversion:** is a game mechanic that influences the user behaviour not by a reward, but by not instituting punishment when the targeted goal is not achieved [14].

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*Social influences:* motivating the users or a group of users through dynamics and social influences, such as altruism, competition, status gain, or the performance of the users considering the points gained.

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- Status:** "Most human beings have a need for status, recognition, fame, prestige, attention [...] esteem and respect of others” [10, p. 10]. “[...] can be earned by the user in isolation, by performing certain actions” [20, p. 183].

- Collaboration:** "The community collaboration on game dynamic rallies an entire community to work together to solve a riddle, resolve a problem, or overcome a challenge” [18, p. 13].

- Reputation:** "is based on the opinion of other users about the user or this user's contribution” [20, p. 4183].

- Competition:** Enables users to challenge each other [10].

- Envy:** This dynamic is based on the user’s desire to have what others have [18].

- Shadowing:** Method where users attempt to improve their previous records [21].

- Social facilitation:** Describes an effect where individual users achieve better results at simple tasks in the presence of other people or when working in groups [22].

- Conforming behaviour:** “[...] is the desire not to act against group consensus, colloquially known as peer pressure” [23, p. 117]

- Leaderboards:** “[...] are used to track and display desired actions, using competition to drive valuable behaviour” [10, p. 10].

- Altruism:** refers to a given virtual gift with the aim of strengthening the relationships between users [23].

- Virtual good:** non-physical, intangible objects that can be purchased or traded [10].

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*User specifics:* motivating the users, while directly influencing the individual personality, e.g., promoting different forms of self-expression.

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- User levels:** “indicate the proficiency of the player in the overall gaming experience over time [...]” [16, p. 104-105].

- Ideological incentives:** “[...] is the notion of influencing user behaviour by influencing their attitudes and values, in other words, educating the user on a deeper level. The ideological incentive

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makes it possible to motivate the user by himself" [23, p. 11].

•**Virtual character:** (i.e. an avatar) represents the employee [12].

•**Self-expression:** results from having a desire to express autonomy, identity or originality, or to mark one's personality as unique [10].

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Gamification can be thought from at least two perspectives: as persuasion, stimulating competition, with a scoring system, rewards and awards, etc., which from the education point of view, reinforces an empiricist epistemological perspective; and as a collaborative and cooperative construction, prompted by challenges, missions, discoveries, group empowerment, which from the education point of view leads to an interactional-constructivist-systemic epistemological perspective (e.g., inspired by elements present in *Massively Multiplayer Online Role Play Games* – MMORPG). It is the combination of M&D, that is, the set of M&D that will be used to develop gamification, allowing to identify which is the perspective adopted, with both being a possibility in a gamified process.

### Flow Theory

The studies of flow derive from research on creative process in the 1960s, with the Hungarian psychologist Mihaly Csikszentmihalyi. In these studies, he aimed to understand why individuals performed particular creative activities in a such a concentrated way leaving their basic needs aside, such as hunger, fatigue, discomfort, sleep, etc. Right after the task was complete, the individual lost the interest in the object that was created, while moving towards a new interaction. This situation represented an autotelic experience – it has an end in itself, with the accomplishment of the task being the reward [6].

The flow theory [24, 25, 26, 27] is an attempt to integrate motivation, personality of the subject, and subjective experience in a single model. It is attempted to explain the causes of the variations in subjective experiences and the relationship between day-to-day activities and specific psychological phenomena that apparently would be connected. On one hand, they perform activities, such as playing sports, belonging to religious cults, playing video-games, dancing, shopping; on the other, relationships with talent, creative achievements, improvement of the mental health are identified [28].

The concept of *flow* is based on a "process of optimal experience" [29, p. 816] that explains the relationship between immersion and pleasure in the day-to-day activities. It is a psychological state in which a subject experiences a feeling of transcendence or singularity where nothing else matters [27]. These situations are characterized by the high degree of concentration on a limited focus, loss of self-consciousness, distortion of sense of time, immersion of the subject in the activity, reward of the activity itself [24, 26, 27] and control paradox – subjects who "are in the flow state" address and report that they control the activity, but at the same time they feel as being out of control [30].

For the flow state to be reached, three conditions must be in place: i) clear goals that direct the behaviour of the subject; ii) fast and direct feedback, indicating the success and failures to the subject; iii) balance between the abilities of the subject and the challenges of the activity [31]. Regarding the last condition, there is a fine adjustment between the challenge in the activity and capacities of the subject. For Csikszentmihalyi and Massimini [32], if the challenge is superior to the abilities, there is anxiety; if the challenge is inferior to the abilities, there boredom. Flow derives from the balance of this relationship [24]. The evolution of this model proposed that the subject starts from the central point and, following the balance between the challenge of the activity and the abilities developed.

When transposing the flow to the virtual environment, video-games are inductive to achieve this state since they have concrete goals with clear rules, have shares and opportunities that can be adjusted to the user's skills; provide immediate feedback about the

player's actions, indicating the success or failure of their actions; and have abundant multi-sensory information (vision, hearing, touch) that distracts and facilitates the concentration [33,34,35,36,37].

### **Gamification as a Training Strategy of Participants in the Company - Contextualization**

The company developed a practical experience of gamification, as a collaborators training strategy of the sales team and service to clients and partners team. A team with three organizers was given the challenge to study the concept of gamification and create a gamified training strategy. The result of this process was the creation of the *Game of Corleones the next CloudFather*.

The narrative and the ludic context of the gamified training strategy was based on the movie *The Godfather*. It is a story from 1945 about five families who were at war for the power over a city. As in the movie, the game involved grouping the participants in families: *Tattaglia, Cuneo, Barzini, Solozzo, Siracci*. The organizers of the game were also represented by one family, *The Corleones*. This strategy proposed a ludic scenario where each participant (40 collaborators) was part of the story as a character. As for the structure of the families, each family member has their own rights and duties (Table 2):

Table 2. Role, rights, and duties of the participants

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**Soldier:** Rights: Family power, protection and connections. Duties: Loyalty and earning money for their superiors. *Game of Corleones:* Taking challenges in the name of the family and being available at all times.

**Capo:** Rights: Direct access to Don. Duties: To be the connection between Don and the soldiers. *Game of Corleones:* Choice of the soldier to perform the challenge, challenging other capos, buying questions and challenges, dealing with the money.

**Conseglere:** Rights: Direct and influential access with Don. Assignments: Help Don to make his decisions. *Game of Corleones:* The users are not allowed to participate in common challenges (only when the Corleones call them). They can participate in all other game tasks, be with Don at each meeting, and deal with money.

**Don:** Rights: Power over all the family members. Assignments: To create alliances in order to empower the family in particular movements. *Game of Corleones:* The users are not allowed to participate in common challenges (only when the Corleones call them). They can participate in all other game tasks and sign the decisions made by the family.

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When the families are being formed, the participants choose the ones who will be playing and define their roles in the game. The strategy was divided in three phases: a) Launching: ludic activity with one of the organizers, who is represented by and dressed as Don Corleone aiming to present rules and objectives; b) Activity: presenting a real case study based on one of the cloud computing solutions, showing the knowledge learnt with the practice with the aim to share knowledge with colleagues and to help them to answer the questions online in the *Web Assessment*; and c) Final challenge: a challenge day with debates and a Treasure Hunt activity. In this stage, only two families with more scores participated and each participant answered the questions individually, until the winner was revealed (in this case, *GodFather*).

### **Methodology**

It is an exploratory-descriptive, qualitative research using as the primary method the case study [38]. The direct observation technique allowed the researchers to gain information

on the gamification strategies and their application in the environment and context studied, through representations, meetings, and observation and the modus operandis of the company. The documents allowed access to the planning information, control and performance of all gamified and non-gamified activities related to the context studied as well as to search for evidence and clarifications about the object being studied. The analysis of the documents allowed the researchers to create new knowledge and search for explanations and highlights over the topic being studied. Regarding the interviews, a script for a semi-structured interview, including open questions that would provide more detailed answers about the participation and knowledge of the reality lived by the interviewees. The script was based on questions resulting from the theoretical references reviewed and the analysis of documents previously explored. The interviews were recorded and later transcribed. Each interview lasted in average 20 minutes; only the interview with the Director lasted 40 minutes.

Forty collaborators participated in the gamified training strategy. 11 people were interviewed: the director of sales and service to clients and partners, three team managers, two organizers of the gamified training strategy, and five collaborators. The interview with managers and the developers of the dynamics aimed to report the history and process of the development of the ideas and gamified actions that were used. With the other participants, the objective was to check what the collaborators understand as being their participation, engagement, opinion, and other topics related to the context.

For analysis purposes, the content-based analysis technique was used [39], with the data produced being organized in analysis categories, considering the main elements of games. These were established following the theoretical review [11], in which those were used in gamified processes through a summary of M&D of games.

### **Gamification as a Training Strategy and the Flow State**

The contribution of gamification as a training strategy to cause the knowledge in cloud computing solutions of collaborators, was associated to the games' M&D. Furthermore, the concept of gamification presents elements can correspond to the characteristics to achieve the flow states because they have concrete goals with clear rules, have actions and opportunities that can be adjusted to the user's skills, provide immediate feedback about the player's actions, indicating the success or failure of their actions, and have abundant multi-sensory information (vision, hearing, touch) that distract and facilitate the concentration. Considering the main games' M&D, some records are presented showing the flow states.

The records show clear goals of expectations and rules: "There was the main objective that 80% of the people had at least a certification in a cloud computing solution until the end of the strategic practice established. [...] So that there was the engagement of a great number of people as the practice would not be mandatory for the collaborators. First we thought about creating an individual competition to stimulate knowledge about cloud. But it was asked [by the Director] for this not be a practice to be made individually, but in groups... but with some ludic parts... [...] Then we thought: what is the image of this gamification practice? We searched the internet for an image, when Don Corleone image showed up, with a cat on his lap and the iron throne of Game of Thrones behind him. From these three elements together, we created a story that begins in 1945, about five mob families that were at war in New York. A ludicity was created with the structure of families with roles, rights, and duties, possibility of alliances, challenges [...] questions about cloud created from web assessments (tutorials) or by their families. It was divided in three phases [...]" (Organizer 1).

Organizer 1 mentions the importance of the elements highlighted by the Director when he posed the challenge: "that was not supposed to be a practice made individually, but in groups [...]. For only a ranking can score the activities would not allow in time the

evolution of the knowledge acquired by the participants". It emphasizes the value of teamwork and the understanding that ranking and scoring do not enable the process to be recognized, therefore, they are not enough when the goal is learning.

Although it was not the object of this article, Organizer 1 references the online materials (tutorials) as being "boring and time-consuming" and "this is why few of them complete the tasks". Consequently, "few or almost no one has the certifications" (...) "in all corners of the company in the world". It instigates thinking about the need for significant changes in the training models, in face-to-face learning or distance learning, which is focused on the didactic materials, and thinking about costs versus benefits, which is many times used to justify the maintenance of an inefficient model that hinders the achievement of the goals aimed by the institution. Would not gamification be an alternative to the traditional distance education models? Is it one of the possible and interesting strategies for the current generation?

Collaborator 1 highlights the fantasy of creating a contextualization narrative of the gamified activities to promote engagement, stimulation, and motivation of the collaborators: "Initially, it was the enthusiasm. Of knowing exactly what the proposal will be [...]. And there was the question: will everybody be engaged, [...] it was so out of our context, of our day-to-day lives; of bringing the theme of The Godfather, they decorated here, so, creating the families [...]. And it was, it was very good [...], which also shows how much one is "used" to a routine, which makes the environment to become little thought-provoking and challenging, and refers how bringing something different to the routine was good.

Regarding the meaning, that is, the background brought by the user to the activity and the contextualization used, so that it really makes sense to participate, interact, and have the feeling of being part of the activity: "Oh, innovation! It was, like, it was hard! [...] but it was a moment for relaxation and innovation inside the team. And I'd do it again! [...] reviewing the rules, talking to the organizers to think about what went wrong, what we could improve" (Manager 1). It also shows that innovating is not something simple, and mentions the importance of experiencing, making something to understand, which allows the process to be reviewed and improved, while recognizing gamification as "an innovative way to bring engagement and motivation to the team for a cause that is unique and makes sense."

A high degree of interaction and concentration is seen, which is known as immersion, when one is completely absorbed in the task and in the challenge: "Creating the families [...] was interesting, the interaction [...], the articulations [...], the fact of having daily challenges, of having to stop and studying something that was proposed [...] and was something from our daily work, of being able to see things differently and hearing other workers' opinion also. It was a moment of [...] openness, as something new [...] for the team [...] everybody participated and did their best [...] for the unification of the team [...]". It is observed how much this strategy surpassed the main objective, which was "enhancing the certifications in the products and cloud services of the [company]", promoting a higher interaction, articulation, listening to the other, openness, participation, immersion, union, when it is mentioned that "It is not only the matter of the cloud; but for all the other topics because there was really a union" (Collaborator 1).

The fast and direct feedback of the activity being developed is reported by Collaborator 3: "[...] when [...] I first heard it, I found it [...] odd [...] to play a game [...] in the middle of our turbulent day-to-day [...] the staff presented the project [...] the objective was to disseminate knowledge inside the team. [...] it made me open my eyes. [...] I found it extremely positive [...] a different way for me, it took me by surprise [...]". The report shows awkwardness in the beginning since the strategy "to play" did not seem to be part of a serious work; however, during the process, it is recognized that this is a "different way to disseminate knowledge inside the team". It also shows how much the institutions repeated themselves

regarding methodologies and practices related to the Corporative Education: “I worked in many other companies, including two big companies, and I have never been through this situation, never seen this situation as it was presented here”.

The challenges had the objective to motivate them and engage them to develop the proposed activities, aiming at learning the new business model adopted by the [company]: “[...] having a challenge and the people focused on discussing and developing... because our work is often "every man for himself" here, so when there is a theme and different people with different perspectives are put together, with different ways to analyse something, it yields a positive discussion. A topic is seen from different points of view and has a better development”. The collaborator refers to the importance of the group, of having a challenge and the people focused on discussing and developing. It allows to understand how well the strategy used translated the guidelines of the Director, when challenged the organizers and asked for "the practice not to be made individually, but in groups” (Collaborator 1).

As the gamified training furthered, the activity was itself compensatory and ludically promoted learning: “[...] actually I really learned [...] many things during this almost 40 days there, during the event. [...] if you ask me: Oh, how would you asses today the game from 0 (zero) to 10, considering 0 as not efficient at all and 10 as very efficient? I'd say [...] 11 [...]” (Collaborator 3).

With the progressive disclosure of the challenges and rules of the gamified training strategy, the improvement of the participant's abilities and knowledges was recognized, as the collaborators comments: “[...] I realized that other participants of my team did not have much contact with some [people] because here they are divided in small groups [...] and these peoples had no knowledge and today they absorbed much more from this sharing of information during the game”.

Innovation implies uncertainties and flexibility, as opposed to a pattern to be followed: “we have no pattern, so we will analyse this case, this other case, and this case”. The collaborator also highlights that, even for the context of a big company (as this one), the strategy was innovative,: “I've worked in large companies before and I had never seen anything like this, no idea similar to this, cool!” (Collaborator 3).

One of the tension points to achieve the balance between skill and challenges was to manage time, that is, the participants were in work environments and there was a certain time pressure regarding their professional and demanded activities for training: “The role I play in the team, and not in the game, requires too much work and time. [...] when gamification started and most part of it was complicated to manage the time because there were many tasks [...] and then I had to compensate because of the workload. So, it was a feeling [...] sensed by everyone [...]. In the end [...] we had a really good result because everybody made the effort [...] to make the things up and ended up learning [...]” (Collaborator 4).

The activities, when concluded, received scores that would classify the families in a ranking. For example, each certification complete was scored: “In my team, everybody completed [the certifications]. [...] it was score, so, let's make [...], it was 100 points [...]”. There was a monitor in the corridor of the work environment, so they could follow daily the evolution of the scores of each family: “[...] they would place the scores in the TV, we were watching that all the time” (Collaborator 2).

Engagement and immersion in the proposed activities motivated the subject or the family in the issues of collaboration, competition, reputation, observation, and community conformity. Regarding the collaboration, the effort, the engagement, and the overcome of the initial expectation of the director, organizers, managers, and collaborators are seen: “I think that it went pass what was expected actually. Some adjustments must be done because the objective of the game was clear to some, but not for all as participants”. The manager also adds: “people got really into it, there were some who spent all night long playing just to

complete the certification [...]. Level-2 certification that must be scheduled” (Manager 1).

Competition promoted an air of individual or group contest, where families wanted to be in the first places in the *ranking*. There were internal arguments caused by scoring issues and injustice feeling. “[...], had competitive parts, [...] people kind of forget they are at work. [...] there is a competition and you think that something is not fair... [...] we were not in favor of the ones who were giving the scores to us [...] we want our rights... [...] They explained why and everything else; but we were not interested; we just wanted our score” (Collaborator 2). An issue is related to the criteria used to assess the challenges or missions. It is essential that they are clear and are supported by all. An interesting possibility is the shared assessment, where the other groups also assess the said group, not only a leader or a group of leaders.

The individual personality of a participant was the differential in maintaining motivation and engagement of the family : “[...] what has really helped was the fact that [...] our *consigliere*, [...] is competitive, it is in her nature. [...] And it encouraged us to chase our goals [...]” (Collaborator 4). The air of competition revealed the need for a leader to manage them and bring them back to the reality of the context: “[...] people end up getting in the game, but who is more competitive takes it personal, like life or death, I want to win, anyway, [...] they're cheating [...] it is not all that, right? Then, you have to go back and bring everybody back to the ground... so, here it is: the most important is that the partners still receive the support for... the work continues and you should not get too excited [...]” (Manager 1).

In this organizational context, the reputation of the participants is related to the sense of responsibility in accomplishing the tasks connected to their position in the company and to the maturity in contributing to the family in the gamified activities: “[...] everyone who dedicated to the game received an extra amount in their salary so they could catch up with their work, that is, I did not have [...] a problem bigger than it was created [...] because someone had something pending because of the game, [...] there is the issue of maturity of the people and responsibility, like, I am playing but I know I still have some work to do” (Manager 1).

Collaborator 2 reveals that the personality of a participant made the difference for creating action strategies to leverage score for their family: “[...] I was Don and there was the *Consigliere* [...] I am a person who would say [...] let's fight back because they made more scores that we did, and she was not, she would say, let's create the entire strategy; then, we would sit back and created the entire strategy. So, she was calm, but ended up showing [...] I would not say leadership, but a different path [...]”. His family had alliances with other groups as part of his action strategy: “We [...] had[...] alliances, that nobody knew, [...] we did not challenge anyone there and they did not challenge us.”

In terms of community conformity, where one cannot act against the group consensus, that is, pressuring or forcing the participants to make particular actions for their self-interest, Collaborator 4 reveals a personal feeling: “Gamification? An interesting discovery [...] I started with so little interest that our team was formed from what the other teams left behind. We were like, let's pretend we are interested, and in the end, we stayed, we made an effort and ended up winning, right? But in the beginning, it was like, I have no time, I don't want to, and it took us by surprise.”

The flow is a mental state where the subject is totally immersed in the action, being characterized by a feeling of full involvement, focused attention, and full participation in the activity. Moreover, it is necessary to find the balance between the level of the challenges provided and the level of skills and abilities of the subjects, which must be in sync with the feelings of pleasure [40]. Reports show the autotelic experience that Csikszentmihalyi [26] highlights in the flow state: "holistic experiences that people feel when act when they are

fully involved" [24, p. 36]. It is an optimal experience; the subject is motivated by his/her own interests, and not because of an external reward.

The practice of gamification developed as a training strategy performed directly in the work environment, promoted an optimal experience since the reports were positive "I would say [...] the best way to disseminate knowledge that I have ever seen so far in the professional field." Manager 1 mentions: "The actual impact was the teaching we were able to have [referring to the learning about cloud computing]" (Collaborator 3). In this report, the manager mentions that the gamified training strategy was complete successfully.

Collaborator 2 understands the difference that the gamified strategy represented regarding learning: "we will be sitting there watching tutorial videos, we do not learn it, it was the kind of play that everybody learned." It also highlights the lack of action and interaction in traditional training content-centred processes, which consequently do not provide learning, but at the same time shows how much you can learn in a play situation. It leads to thinking on which are the motivations the institutions still adopt outdated training models, while ignoring the current learning theories and the potential that comes with the digital technologies.

Being more specific, the activity attracts the subject. In this study, it was the use of gamification as a collaborators training strategy to yield the knowledge of cloud computing by providing the participants new ways of experimentation, exploitation of resources, confrontation of challenges, attitudes, feelings, emotions, reactions, behaviours, etc., both individually and in the shared and collective level.

### **Final Considerations**

The practical experience of gamification developed as the collaborators training strategy in the company studied here to cause the knowledge in cloud computing solutions took place in a context in which the participants were in their work environment the entire time. The use of game concepts to instigate learning in this context by using game elements, such as M&D, was a gamified activity that efficiently promoted, e.g., engagement, motivation, socialization and learning of the collaborators. The results showed that this experience allows the collaborators to live and experiment how the dynamics of actions and gamified activities work in an organizational context aiming to achieve the goal of the company.

Therefore, collaborators, when they live, experience, and perform the activities proposed in this training strategy, could use the possibilities offered by the gamification recognized by the elements present in games – including the games' M&D – such as feedback, meaning, interaction, fantasy, time pressure, rewards, point systems, achievement, collaboration, reputation, competition, shadowing, conforming behaviour, leaderboards, enhancing the flow states.

The main evidence of flow states is: establishing clear goals, concentration and immersion of the participant when developing tasks, feeling of controlling awareness and attitudes, feedback, and the balance between the subject's abilities and the challenges of the activity proposed. Furthermore, reports reveal the autotelic experience of the participants, which occurs during the entire process of the activity, and not only on partial or isolated results.

Results question the effectiveness of the current training models adopted by the institutions, in face-to-face learning or online mode, which are predominantly content-focused (in text, audio or video) and their relevance to the way the current generation learns. It leads to think on which motivations the institutions still adopts outdated training models, which ignore who the current subjects of learning are, how they learn, the current learning

theories, and the potential that comes with the digital technologies.

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