for gamification in education: why should you care?

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Abstract—**Gamification applied to education studies are focusing to encourage students to perform specific tasks, however many of these studies are still inconclusive about how much gamification can influence engagement. Also, the frameworks used to apply gamification in those systems are mainly structural (e.g. scoring and ranking systems) rather than content frameworks (where the game elements are applied to the content). Therefore, this paper aims at creating a narrative definition exclusively for gamification purposes. First, we developed an empirical research starting with a literature review of the narrative concept in other medias, such as games. Then, we mapped these definitions into features and crossed the similarities and differences across them, to find a common ground that could be applied in gamification contexts. Our results show that the narrative element definition to use in gamification contexts best drifts from the games ones, however its definition is unique to the point it could be isolated and used in future frameworks. We also found that the characteristics of this concept resembles some of User Experience.**

Index Terms—**gamification, narrative, games, framework, education**

I. Introduction

One of the main purposes of gamification (defined as the use of game elements outside its main context) is to engage and motivate, to perfect or to create a desired behavior in training and teaching processes and to improve the user experience [1], [2]. Concerning the gamification educational potential, the process has been achieving positive results [1], [3], [4], when used concomitantly with traditional methodologies or as a complement to virtual applications.

Still, several authors disagree on the classification and definition of these terms, and few use a formal definition for use in gamification processes [5]. As an example, we can cite the framework developed by Dignan [6], where the author classified 19 concepts found in games, in contrast to the study by Aparicio *et al.* [5], where these concepts can be classified according to the motivational pillars of Pink [7] and Marczewski´s [8] Gamification Hexad Scale for User Types, a more recent model where they present six types of users described at a basic level. The model then mapped and validated these user types preferences based on the 52 game elements and mechanics classified in Marczewski´s Gamification Elements Periodic Table [8].

One of these underused elements is the narrative. Described as the 10th element of Marczewski's Periodic Table of Gamification Elements [8], narrative is described only as the element that should deal with stories and plot lines. Other works does similar descriptions, which contributes to the element being misunderstood and consequently underutilized.

Based on this premise, this study aim at answering the following questions: *i) what is the narrative in gamification contexts? ii) what are its specific features* and above all, *iii) how it can be applied in practice*, in the education domain? This information will be used, amongst other things, to develop a framework focused on well-thought narratives that can be used in education domain, aimed at improving students' engagement and motivation, as well as their learning rate.

II. Conceptualization and Existing Works

As one of the first theoretician to research narrative, Ricoeur [9] wrote his considerations regarding the reason human being narrates and tells stories, as well as the stages (or *mimeses*) through which these representations take shape. According to Ricoeur, one of the explanations to why human beings need to tell stories, is connected to the relationship between time and narration.

In this sense, the narrative becomes a way of assuring humans against their anguish and pain in the face of the passage of time. Life can take unexpected turns, but the story, created by humans, will always follow its designs and a programmed logic [10]. Thus, narrative is a sequence of events transmitted by an individual. This sequence may undergo modifications and be modified in quantitative or qualitative terms through the way, *i.e.* how it is told, aka storytelling. Narrative also fulfills a calming function and, in this sense, it's crucial to understand their role as a gamification element related to motivation and purpose. The act of narrating stories comes together with a purpose of meaning, and constant transformation - by establishing a dialogue with your receptor.

To discuss narrative in games, it is important to observe the role of the narrative as it is lived through the game. In this sense, the narrative begins to unfold from the moment the player starts the game, the visual representation of the game and its interaction mechanics. Everything is an element that contribute directly, and in a unique way, to this narrative experience in games [10]. Bellow we present three base narrative definitions in digital media, and especially in games. Manovich [11] discusses what the new media would be, and how this new language or digital code affects the narrative. For the researcher, the changes in the media have triggered transformations in the cultural body, promoting new communication, language, behavioral, and representative strategies. The narrative, in turn, is established as a modality within a broader aspect, which is the way the human being experiences its existence and how he chooses to represent it in the digital

age. Manovich [11] verifies its basic elements can be found in the fundamentals of programming.

As for Salen and Zimmerman [12] narrative is defined as a composition of rules that are experienced through play, so the player interacts in the space of possible actions within a game, allowing them to explore and interact with the game's universe. They further stress that it is important not to rely only on comparison with narrative in other medias to not be distracted from essential elements such as rules, objectives, the player's participation and the impact of their actions in the game universe. This can occur in two distinct ways. The first one is called of embedded narrative [12], and is defined as a pre-generated content that exists prior to the interaction of the player. This kind of narrative is designed to provide motivation for playing the game, the games' story for example, because it gives a sense of purpose to actions. The embedded narrative aims to give a significant stake to the player through the plot, as a premise to story, characters and sequence of events, which give a dramatic unity to the player's interactions and journey.

The second narrative possibility is called emergent, configuring itself in the story that is created from the interactive experience of the player. Its base is also planned by the game designer, but its unfolding is often not. This is due to the events created as an organic consequence of the player's autonomy in the face of the game mechanics and their meaning experience as a user [10], [12], [13]. By this logic, the emergent narrative is only possible because it is directly connected to the chain of mechanisms that make up the game system and meaningful participation of the player who is able to interfere. Thus, a change in the system, from the actions of the player, can result in another modification of the narrative patterns of the game and affect the experience as as a whole. The emergent narrative depends not only on the player's action, but also of what is happening in the system at that very moment. Thus, it is possible that the same actions result in different outcomes, since the changes occurred in the systems are not necessarily the same. The emphasis of narrative is how the player interacts with the game system and creates their own, and unique, sequence of facts [10], [13]. In addition, the two narrative types should balance each other when well worked. This balance allows the creation of unique narrative experiences, only possible in games [12].

As we can see from these two main definitions, narrative in a digital media is intrinsically connected to the system from which it derives. In this aspect we found important to consider the Human-Computer Interaction (HCI) concepts such as user experience [14]. From this point in the work what can be stated is that narrative (be it embedded or emergent) in interactive digital systems depends heavily on the user experience.

III. Methods

To be able to use these elements, such as narrative, with the same understanding and breadth as we have covered the structural elements of game mechanics in the development of future frameworks and / or gamified solutions, it is believed to be of utmost importance the correct understanding of the

characteristics or features that carry such a definition, both in its literary origins and consequent unfolding in films and in the digital games themselves, as well as in the specific context of gamification. Thus the present work was carried out through an empirical research based on a literature revision of the definitions and concepts presented by the most traditional authors in the areas of literature and narratology, communication and digital games, culminating in the most recent studies on the subject. The four definitions resulting from this analysis were then compared on the concepts similarities among each other in order to identify elements in common and discordant. These elements were then classified as their relevance and possible use in the construction of gamification projects.

Finally, we elaborated a definition of narrative for use in gamification, so that the element is better understood and consequently more used in future projects, researches and development of frameworks and / or approaches focused on content.

IV. Results and Discussion

TABLE I
Breakdown of the narrative definitions common features

Features	Ricoeur	Manovich	Salen and Zimmerman	Marczewski
Actor		X	X	
Choice or Possibility		X	X	
Interactivity		X	X	
Narrator		X	X	
Plot			X	X |
Sequence of events	X	X	X	
Space	X		X	
Story/Data	X	X	X	X |
Time	X		X	
User Experience		X	X	

The analysis of the basic definitions of the term, as well as its most recent and technological derivations allowed us to map and catalog features in common, as presented in Table I.Based on these concepts, we can assume that: (1) The term narrative and story blend together and are often confused. We believe that this is one of the reasons why it is still rare to work with narrative as an approach / framework in gamification (and its application in education). If the spatial problem of the element is not well delimited, its practical use becomes too complex. Structural elements, more easily defined and delimited, become more viable alternatives for use in the instructional design of gamification projects; (2) existing frameworks of gamification see the narrative as the same as story or storytelling, and not as the events that are developed through users' interactions, aka as part of the user experience; (3) the definition of narrative for digital games by Salen and Zimmerman [12] is the most complete in terms of the concepts they are built on, having as a differential the classification of the two types of narrative (embedded and emergent), which in principle would solve the confusion regarding the terms narrative and story. However, by working with other intrinsic elements of digital games, it is not possible to simply use it for gamification; and (4), on the mapped features, only one is unique to all definitions applied to digital games: user

experience. This is supported by the fact that in the academic context, especially in computing, the use of gamification is a mean for conditioning behaviors in the user [15] which intersects with the design view of HCI software.

To measure the quality of a particular software, including digital games, HCI has some criteria such as Usability and User Experience, Accessibility and Communicability. Based on the recent studies by Hodent [16], it can be said that the part of UX that is most relevant to a user's willingness to use a system and to continue using it.

We concluded that to be able to use narrative as an element for the design of gamified projects, especially for education, the term narrative should cover at least the following features: The existence of the actor (as the user / student), the element of choice (while options available for content progression), interactivity (the system must respond to user actions), sequence of events (there must be a logical chain of these actions so that progress makes sense to the user) , space (as the virtual space), date (as the information presented), time of interaction and mainly, so that it is constituted in an element capable of motivating the student, the feature of the user experience. As such we could say that:

"The Gamification narrative element can be understood as the process in which the user builds his own experience through a given content, exercising their freedom of choice in a given space and period of time, bounded by the system's logic."

We believe the path to using narrative as a content element for gamification frameworks and/or approaches is the ability to map and control the user experience in a way to guide the student through the content. In order to do that we should delve into HCI user experience concepts and cross them with digital games interaction. As stated before, the engaging ability is, amongst other things, directly connected to the experience and satisfaction resulting of the interaction process [16].

V. Final remarks

In this work, we presented a concept of Narrative that can be used in gamification applications, based on existing literature. As for the limitations of this research, we opted to work only with grounded theories about narrative. We are aware that recent communication studies are delving into the crossmedia and transmedia [17]) viewings of narrative.As we believed the very base definition of narrative in gamification did not matched the concepts from game studies literature, we choose to develop a solid definition that could be understood and used with different areas aiming to build and/or relate with content gamification frameworks.

As a way to validate the concept, we are currently working on creating a taxonomy of elements based on gamification experts' opinions.

As future works we intend to propose the development of a narrative-based content-oriented gamification framework for educational purposes, that will be experienced by the student as they advance in their studies. We work with the hypothesis that a narrative can be embedded in a subtly way into the learning environment. In this sense, it is of utmost importance a more in-depth study of the user experience field, seeking to bring the multidisciplinary knowledge of the HCI area to the Gamification context. In specifically addressing Gamification of Educational Systems, this is believed to be a valid path for future works.

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