

Gamifying Class Assignments: Allowing Students to Choose Based on Their Interests

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Abstract—Educators worldwide strive to transform what are often perceived as “dull learning environments” into engaging ones. Although numerous studies explore gamification in education, few explore the gamification of class assignments. Building on the premise that individuals are more likely to engage with tasks they find interesting, our central research question was: What factors contribute to the interestingness of class assignments? We conducted a qualitative study (employing Thematic Analysis) involving Brazilian college sophomores tasked with designing assignments for their enrolled courses. Our qualitative findings revealed several characteristics that can enhance task interest. Furthermore, we found that interestingness varies based on individual factors, rather than adhering to a one-size-fits-all solution. Additionally, we profiled students according to their gamification user types (utilizing the Hexad framework) to understand assignments from the perspective of different user personas. This study offers valuable insights into the gamification of classroom assignments, contributing to the fields of gamification and instructional design.

Index Terms—Gamification, class assignments, students’ choice, interestingness, qualitative study

I. INTRODUCTION

Gamification (*i.e.*, “the design of systems, services, and activities to provide motivational benefits similar to those games usually create” [1], [2]) has been used as a strategy in many educational scenarios [2]. Exposure to a gamified system can encourage the repetition of desirable behaviors and, depending on the experience, change the way students perceive what they are supposed to learn [3] and engage them in tasks that can take much time and effort [4].

An important part of creating an engaging learning environment is related to students’ assignments [5], [6]. Even the most basic game-like experiences may be disruptive when it comes to academic tasks (*i.e.*, assignments) [5]. However, most of the studies in gamification are focused on analyzing attitudes, behaviors, and perceptions around the use of the most popular game elements like points, badges, and leaderboards [3], [7], [8]. However, the body of knowledge regarding other aspects and game elements is still scarce [2].

This work has been supported by the Academy of Finland Flagship Programme [Grant No. 337653 - Forest-Human-Machine Interplay (UNITE)].

The authors utilized generative artificial intelligence (*i.e.*, Microsoft Copilot) to improve the grammatical quality of the text.

In this paper, we present a gamified pedagogical intervention designed to allow students to be in contact with the game element choice to understand this phenomenon: if students had the opportunity to design their assignments, which features they would embody to make them as interesting as possible? We present the results about interestingness when analyzing the assignments prepared by our students.

II. CONCEPTUAL FRAMEWORK

According to the Self-determination Theory (SDT), the choice is related to one of the basic psychological needs of autonomy [9]. Individuals experience autonomy because of the urgency of full volition, however, what students consider highly valuable is likely not only the act of choosing *per se* but the appraisal inherent in the options that are defined by themselves and personal objectives [10].

At the same time, gamification has emerged as a promising approach to enhance motivation and engagement in educational contexts [2]. Gamifying educational experiences requires considering multiple layers of what affects how people engage [1] and choice can compose a gamified experience [11]. It has to do with the environmental context in which gamification will take place, personal traits, and behavioral factors [10]. Based on SDT, people may assume different personas which might overlap [12], [13]. Since each student has their own psychological needs, is motivated by different stimuli, and reacts to an educational intervention in particular ways [11], [14].

III. STUDY DESIGN

We conducted a qualitative study to explore the properties of engaging class assignments. By allowing students to create tasks through a gamified experience, we analyzed their assignments and peer evaluations using Thematic Analysis.

A. Learning setting

The study was conducted within a Computer Science class at the Federal University of Paraíba, Brazil with 49 students, aged 18 to 21. 41 of them volunteered for a study. The professor, aware of the challenges, explained the gamification elements without compromising pedagogical goals.

The gamification design was organized based on the Taxonomy proposed by Toda *et al.* [11], [15], as follows: 1. **points** (“A way to provide extrinsic feedback to the users’ actions”): all effort in the classroom or outside of it would be converted into credits; 2. **time pressure** (“It is related to time itself used to pressure the learners’ actions”): sometimes there would be tasks during classes that need to be done in a short time; 3. **cooperation** (“users must collaborate to achieve a common goal”): students would be invited to work in pairs, however, they could choose to perform some activities by themselves; 4. **renovation** (“the property of re-doing a task, event or any of the sorts. It allows the learner a second chance after they fail a task”): students could redo some of the tasks and even resubmit tasks whose deadline has expired; 5. **progression** (“guidance to the users of their advance in the environment, allowing these users to locate themselves”): The assignments created by the instructor encouraged them to revisit what was taught, creating an opportunity to apply what they were learning and also reflect on evolution; 6. **choice** (“an example of this concept is to present the user two different contents and make them choose one or another, blocking their advance if a choice is not to pick”): they had different opportunities to experience choice. They could choose how they would act, whether alone or in pairs, for example. They would also have the choice of designing their assignments and picking which ones they would like to do.

B. Guidance for designing the assignments

After three weeks of classes, students were asked to propose one class assignment that they would like to perform work on. It was supposed to be interesting from their point of view. We explained that assignments could be created in a way that other students would want to do as well. Regarding the tasks, no requirements or restrictions were imposed by the professor. We wanted them to focus on features instead of aspects like feasibility. They were instructed to create a clear description of the assignment and assign it a level of challenge, informing which criteria were used to designate the level of difficulty of what they were proposing.

C. Material

To recognize individual differences through the intervention, students were grouped using the Hexad framework [16], which made it possible to identify their profiles as users of a gamified system [17]. The Hexad is based on six personas that are segmented by their motivations, according to the Self-Determination Theory [17]. The Hexad scale version used in this study is validated in the Brazilian Portuguese language [18], [19] and consists of 24 questions about the behavior and preferences of players within games.

Hexad types are defined in different literature [13], [16], [17] as follows: **Socializers** are motivated by connections, like to interact with others and create social bonds. **Free Spirits** are motivated by autonomy. They want to be free to create and explore the environment. A sense of competence moves Achievers. They want to evolve their skills and develop new

ones. They like to overcome challenges. **Philanthropists** are selfless and generous, and help others without expectation of reward. **Players** like to be rewarded. All they do is look for some compensation or try to take advantage of something. **Disruptors** are motivated by change. They seek to change the system anyway. They are argumentative and do not accept things as they are.

D. Data collection and analysis

We carried out analyses to understand the nature of the assignments in light of their profiles. Of all 41 students who completed the Hexad scale, 25 chose to design one assignment. Since our participants were these 25 students, we used convenience sampling. It is important to mention that they were not aware of their profiles when working on the tasks. This information was revealed later. After analyzing data from Hexad, some participants fit into more than one profile, which is expected [17]. The profile Disruptor was the least featured, averaging 3.79. On the other hand, the Achiever profile had the highest average, reaching a score of 6.26.

Because a person assumes more than one persona, students were informed of their profiles and then asked to select their predominant type. After cross-checking data to understand who designed the tasks, we ended up with this view: twelve were created by self-declared Achievers, five by Players, three by Philanthropists, three by Free spirits, and two by Socializers. During the step of evaluating interestingness, forty students assessed the set of assignments. They were invited to look at assignments and assess them as interesting or not. Also, explain why and indicate which one they would choose if they could do so during the course.

Each assignment was assessed by at least three participants. We compared data considering the Taxonomy proposed by Toda *et al.* [20] and interpreted their responses using the Analysis Thematic technique. Initially, two data sets were coded. We adopted an open coding strategy because we wanted to be driven by what might emerge from our data. The first codes aim to extract meaning from the assignments. They aimed to point out characteristics related to interestingness. Then, in the next round of coding, the emergent codes were crossed with the characteristics of the students’ personas.

IV. FINDINGS

The assignments created by the students assumed different forms, such as quizzes, surveys, debates, tutorials, tasks involving programming, and even a game. 15 assignments were considered interesting. To make this judgment, we considered those that had a high number of “yes” to the question: **Do you consider this task interesting?** The responses for why a task was interesting were analyzed to seek fragments within the responses that highlighted characteristics that make it such. The characteristics that emerged were mapped into codes like **I learned something new or I felt rewarded**; The activity is Dynamic emerged in tasks made by Free spirits and Achievers. The code **The goal of the task** is clear occurred in Philanthropists and Players discourses.

Socializers consider tasks interesting when they encourage debate as a way of socialization. Other characteristics that can make a task interesting for Socializers are the bond and cooperation between participants. We understood this based on the code **I can work in a team**. Philanthropists find the tasks interesting when there is clarity in their descriptions (the code **Clarity in the Activity occurred multiple times**). Our philanthropists considered assignments that merge useful and everyday information with academic knowledge as interesting.

Assignments capable of giving voice to students are interesting for Free Spirits (coded as **There is room to express what I know or think**). Players find collaborative tasks interesting, according to responses regarding the code **Activity Is Collaborative**. Being rewarded is also a feature that makes Players interested in the task, as highlighted by responses like I felt rewarded. The code **There is Clarity in the Activity** could be seen here, on the profile of the philanthropists and players. This code was another with a high score of prevalence. Achievers point out that tasks are interesting when they perceive learning something new, as the code **Learn Something New revealed**. Achievers want to master their skills. The code **I have the opportunity to do in practice and show what I know** emerged. Another characteristic, already seen on Free Spirits responses, and that appears here, is the fact of the activity being dynamic, highlighting the code **The Activity Is Dynamic**.

A. Limitations

The findings might reach educators and researchers since this study was carried out from a qualitative perspective. Any kind of generalization is not possible since the findings are attached to the context described in this paper.

V. FINAL THOUGHTS

With this study, we intended to benefit from the use of gamification strategies to understand the interestingness of particular groups of students. Some assignments have intrinsic features capable of engaging students profiled such as. We described how students were invited to co-create the learning experience by helping the instructor design class activities, *e.g.*, a conversation wheel is an assignment that might be more interesting to Socializers, because the main characteristic of this resource is to create a space for discussion. Philanthropists are interested in tasks that they can help others with or there is clarity in the description of the activity, *e.g.*, tasks that students have to collaborate. Free spirits feel interested in tasks in which they see that the task can be dynamic and that they can express their opinion, just like a conversation wheel. Players are interested in collaborative and clear tasks, and those in which they might be rewarded. Collaborative quizzes that have rewards at the end fit this persona. Finally, Achievers find interesting tasks from which they can learn something new, and those that allow them to master skills, progress, and engage in dynamic activities, such as general knowledge questions or even field research.

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