An Experience Report on Teachers' Training for Unplugged Gamified Teaching in Brazil

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***Abstract*—This experience report addresses training that was offered to teachers in Brazil. The main objective of such training was to train teachers to be able to gamify their own classes, in an unplugged way (i.e., without the use of digital technologies), and student-centered (i.e., personalized). The external observation was used as the primary data collection approach. This initiative was proposed by the Brazilian Ministry of Education, in which 27 laboratories were made available (one for each state of the federation) with the aim of preparing teachers nationwide. However, although some educators have shown a strong interest in using gamification as a strategy in their classrooms, a second group has demonstrated some resistance to the incorporation of gamification within the scope of education. These different levels of receptivity among teachers highlight the importance of continuous support and professional development to ensure the successful integration of gamification into the educational setting.**

***Keywords*—Unplugged gamification, Gamified education, Personalized gamification, Teacher training, Experience report.**

I. Introduction

A recent study conducted by the Brazilian Institute of Market Research and Strategic Consulting, carried out in August 2022, shows a troubling reality: two million young people aged between 11 and 19 who have not yet finished basic education have dropped out the school [1], representing 11% of the surveyed sample. Among the reasons for dropping out, 38% of students stated that "the school is uninteresting", as well as another 29% said "they feel that the school is not very useful" [1]. Such statements indicate the need to improve the educational system in Brazil, so that it becomes something more engaging, spontaneous, and authentic for students, consequently, decreasing this sense of uselessness or disinterest which influences the growth of numbers previously mentioned [1].

Different education actors have been looking for alternatives to improve this scenario. One of the strategies discussed is gamification (*i.e.*, "the idea of transforming systems, services, organizations, and activities to provide similar experiences as those games usually provide" [2]–[4]), associated with its personalization, to maximize the results obtained [5] since personalizing gameful applications is essential to account for interpersonal differences in the perception of gameful design elements [6], and since different users are motivated differently by different game elements, so it is crucial for designers to understand the relationships between game elements and their influence on users [7].

By simulating different adaptation techniques, gamification can positively affect learners' motivation and engaged behaviors depending on the profile(s) used in this context [8]. Studies show that students who use gamification techniques can have significantly better learning outcomes than those who do not use gamification in their courses [9], just as personalization is essential for playful systems [10] since gamification is relevant to both, practitioners and academics [11] and many pundits have promoted the potential of gamification for motivating students to perform desired learning tasks [9]. However, the lack of resources that prepare teachers to use gamification makes its implementation more challenging.

Facing this challenge was created the Creativity and Innovation Laboratory for Basic Education (LABCRIE), an initiative of the Brazilian Ministry of Education (MEC), conducted in partnership with the Federal University of Mato Grosso do Sul and the Brazilian Certification Network, Research and Innovation. The main objective of this initiative is to support the implementation of dynamic spaces dedicated to the continued training of teachers in the public education network in innovation and educational technologies. LABCRIE has several modules, one of which is Gamification in Education, in which teachers are trained to use unplugged gamification in the classroom.

In this paper, we present an experience report on the carried out training in gamification in education, in which we presented the concept of gamification, personalization principles based on the student's profile, and guidance teachers

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on the process of gamifying their classes. At the end of the training, we propose that teachers develop a gamified and totally unplugged material to be used in their classrooms. The observational research method was used in the study, in which during the training the monitors were responsible for observing the behaviors, actions, and expressions of the participants and reporting their impressions.

As a result, we observed that teachers, despite not knowing the concepts of personalization or unplugged gamification beforehand, were able to produce materials that would possibly motivate students. Some groups' teachers were more organized than others (while producing the materials) and, at the time of production, they were able to use the gamification elements in a playful way that would possibly catch students' attention. On the other hand, other groups still focused on more traditional and unattractive strategies. This work contributes to the field of gamified education, providing insights into how gamified activities work in practice and how they can be applied.

II. Training Design

The training was designed to last four hours, divided into two parts: *a)* a general presentation of the gamification theme and *b)* A hands-on activity to measure the knowledge acquired by the participants. Initially, a detailed presentation of five gamification designs Toda *et al*. [12] was presented, intertwined with moments of interaction which computed points to be used in the second moment of the training.

During the first step, participants were divided into five groups, a number chosen on purpose because we wanted to get them working on one of the five gamification designs proposed by Toda *et al*. [12]. Participants were told that one of them would be chosen to get to know all the other members and introduce them to the whole class. This information was revealed after its closure, with 10 points given to the person chosen to be a leader, and more two points for each participant in the group, since all the presentations made by the leader were correct.

Continuing, the concepts of games and gamification were presented, and after the explanation, the participants who accepted the challenge of answering the definitions received a badge. As we can imply, the training was a gamified experience, and some tangential knowledge was taught it was in progress. In sequence, the steps for applying the gamification were presented. At that point, scores were assigned again when some of them made conquests.

In addition, we chose to gamify the workshop, as gamifying an activity that explores the concept of gamification provides a unique experience, and by experiencing in practice the principles that make activities so engaging, participants can understand in a deeper way and tangible the elements that drive motivation, learning and active participation. This not only creates a more playful learning environment but also highlights the applicability of gamification in different scenarios.

The Hexad scale [13]–[16] was adopted with the purpose of providing resources to teachers to identify the individual profiles of their students, thus contributing to the development of personalized activities. Participants who promptly responded to a previous survey were informed about the award of 5 extra points. Subsequently, the five gamification models proposed by [12] helped by helping teachers create gamified activities that fit the profiles of the students they aim to reach.

After completing the explanations about the game elements present in each of the five gamification designs, a challenge with implications was introduced. Participants were asked to agree to answer a question about a topic addressed during the workshop. The predicted reward was five points for the entire group in case of a correct answer, while an incorrect answer would result in the loss of two points for everyone. Only one volunteer appeared for the task, who answered the proposed question correctly. With that moment concluded, the presentation of the contents came to an end, and the practical internship began.

The five gamification designs were designated among the five groups. Each one elaborated an activity to be applied in the classroom that contemplated all the elements of the chosen design. To carry out the division, the score of each group was considered as a criterion. The owner of the highest score could be the first to choose, and so on. After that, participants were given a deadline for carrying out the activity, and they were also informed about the system for using the points obtained in the first stage.

The training was conducted by two instructors and three assistants. In addition, each group was responsible for a gamification design, having to propose a gamified class in the practical activity using the elements of a specific design assigned to their group. The groups were able to use their points to get advice from training assistants: super advice had a cost of 15 points, a technical tip, 10 points and a mini tip at a cost of five points.

At the end of the training, each group had three minutes to present their gamified design, being able to choose how to make this presentation. After this moment, feedback was presented about each proposed activity, and the closure was also carried out.

A. Participants, data collection and analysis

The 15 participants (teachers) were aged between 22 and 52 years old. Most of them (26.7%) work in high and technical schools. The most experienced participant has 35 years of teaching. In addition, about (60%) of the participants are already used to play some game. Regarding the number of hours played per week, the highest occurrence was between 1h and 3h. Furthermore, (86.7%) of the participants had already heard the term gamification.

B. About the Workshop

After using the designs to develop a learning experience (a class), each group had the opportunity to present their outcomes to others. This presentation was followed by a brief evaluation we made of the proposals presented, in which we observed whether the elements used really belonged to that

TABLE I

Team	Main Lines
B	- "Award is learning" - "Students do not give due value to learning" - "Unfair for one team to be rewarded and another not" - "These tasks are their obligations, it's what they have to do."
E	- "Nailed it" - "Let's do everything, we're good!"

design, in addition to making considerations about the way in which they were presented.

In the following tables, we presented a summary of two points observed after the analysis of the proposals and presentations. Table number one presents the main lines said by teams B and E, where we can see the difference between the vision of each one about the application of gamification. Then, **??** present the highlighted moments observed during the development of the activities by the groups, showing how the reactions became different from each one.

- **Team A**: Participants 3 and 4 discussed their gamification profiles. Participant 3 cited ease with social design, while 4 cited difficulties.
- **Team B**: Leader expressed resistance to the award.
- **Team C**: Participant 1 reported not understanding the method and objectives of the practical activity, even after every tutorial.
- **Team D**: Participants 1 and 2 reported ease with fictional design because they had an affinity with science fiction and had already used it in the classroom.
- **Team E**: Excited team, celebrated each gamification element discussed.

III. Lessons Learned

Initially, we noticed that some participants in the groups felt more comfortable working with designs that they considered to have more affinity for their elements. For example, the fictional design team after completing the activity reported that it was something easy and cool to do, as they liked science fiction and Role-Playing Game (RPG) and had already used this strategy in their classes during the pandemic.

In addition, the resistance to gamification inhibited the creation process of the performance-based design team, because from the team leader's point of view, students should do their activities anyway, and the knowledge gained would be their reward. In this sense, the following question arises: "Would the fact that they did not consider gamification a strategy that could motivate and engage students make the material produced by this team not attractive to students?".

Another issue observed was that teachers knew very little about gamification and several controversial concepts about it. In view of this, after the training, we realized that curiosity had been aroused, since during the production of the materials they discussed which user profile they could have, and which profiles their students would have, they talked about the gamification elements they did not know. In general, it was observed that we sparked the curiosity of these teachers and that they were motivated when learning about gamification as a strategy to help them in their daily lives. In this sense, it was clear that most teachers did not use gamification because they simply did not know how, did not understand the basic concepts, and did not have guidance on how to start.

A. Discussion

Gamification is now a well-established technique in Human-Computer Interaction. However, research on gamification still faces a variety of empirical and theoretical challenges [4]. When thinking about these challenges, an extremely simple one can emerge as something intriguing and complex: How to take gamification to environments where it does not exist, or where there is no easy access to a computer? Research data carried out in 2020 by the Datafolha Institute, indicated that (29%) of the Brazilian public schools do not have access to the internet, and (55%) do not have an adequate connection [17].

With this limitation in mind, developing gamified activities in an unplugged context becomes a strategy to be evaluated to seek better results in student development, since learners using gamification techniques had significantly better learning outcomes than those who did not use gamification in their courses [9].

The process of developing activities proposed in the training carried out for this study sought to introduce and minimally train the teachers involved in the application of tasks that could bring these concepts to the classroom, awakening in them the curiosity necessary to provoke a deepening of the theme, and its consequent spread. Knowing the five possible gamification designs [12], their elements [18], and knowing which tools to use to identify the predominant profile in the students, grants the teacher a new powerful tool for his/her pedagogical practice.

Throughout the training, it was possible to observe how the groups sought to develop their activities, even trying to understand their own Hexad [14] profiles. A It was also possible to observe the affinities or lack thereof with certain demonstrated designs, such as participants 1 and 2 of team D when referring to their themes. It was also possible to observe the resistance to gamification demonstrated by some participants with traditional views of education, an explicit fact in phrases such as those uttered by the leader of team B, mentioning tasks as obligations of students, and listing knowledge as the reward of their effort, highlighting the lack of appreciation of learning on the part of their classes, or their refusal to accept the award from only a portion of the students, an element present in the performance design [12], [18]. It is also worth mentioning the difficulty of understanding the new strategy for some, expressed perfectly by the difficulty presented by participant 1 of team C. Finally, the strategy provided a good moment, with good learning and experiences, a fact that could be observed by interjections from excitement

such as those used by team E participants when achieving the expected results in their task.

Furthermore, the experience lived by the assistants clarified the need for guidance for educators who discover gamification and its application in day-to-day activities, so that they can unlock their full potential, respecting the individual elements of each design, while reaching totality of the number of students approached. Finally, the explanation of the activities developed for the whole class brought new visions, new points of view, different from those seen in the restricted universe of each team, which made it possible to expand the considerations discussed by the group as a whole.

In Figure 1 it is possible to observe a record of the training carried out

Fig. 1. Training record

The training reported by this work reveals an interesting tool for the presentation and introduction of the basic concepts necessary for the development of unplugged gamified activities, and this adds another valuable tool to the collection of options available to the educator, adding a new possibility of methodology, always welcome in the educational context.

In addition, it is worth mentioning the importance of practical activities when we are dealing with gamification. Understanding the theoretical concepts behind gamification is not enough to implement it successfully. This is where the importance of carrying out practical activities in training on gamification comes in. A hands-on activity provides the opportunity to put learned concepts into practice, allowing participants to experience first-hand how gamification can be applied in real-life situations. This not only helps consolidate theoretical knowledge but also allows participants to learn from mistakes and adjust their approaches.

In Figure 2, it is possible to observe one of the teams presenting the material that was developed during the practical training activity.

B. Limitations

The study has some limitations that should be addressed in future work. Initially, not all teachers (who participated in the workshop) had experience in gamification. To mitigate this issue, we dedicated part of the workshop to training them on gamification, which had a considerable impact on the content presented, since the short duration of the workshop (four hours) may not have been enough for an in-depth discussion of the basic elements of gamification, presentation of the

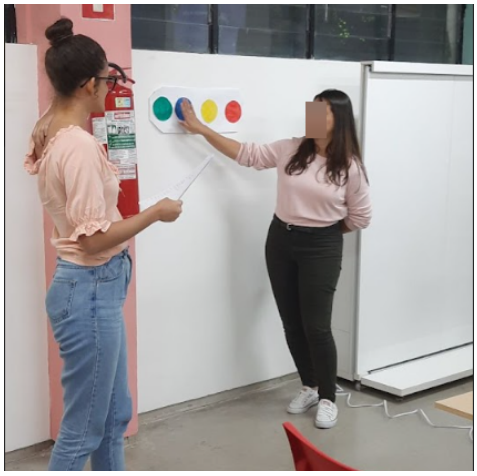

Fig. 2. Presentation of teachers

concepts of custom designs and execution of the practical activity, reducing the effectiveness of the tutorial. Participants were divided into groups (randomly) so that each group was responsible for a type of design. This strategy, although interesting, limits each group to knowing and developing proposals of only one dimension, a single design. In addition, the difficulty of accessing a greater variety of materials for the preparation of tasks, as well as a less efficient organization of the assigned space, had a limiting impact. In the end all designs were openly presented and discussed by participants and instructors, a moment that also needed to be rushed, due to the need for some participants to leave the place, given the late end time.

C. Future steps

The next stage of this work will be to carry out new workshops to refine the proposal, which can be offered in a longer time so that the discussions are deeper. The first version of the training, with its brief duration, restricted to just one afternoon, does not allow for a more in-depth presentation of the basic elements of gamification, a knowledge that is of great value to clarify everything from how to develop its application to how to measure its results. The sample size can also be expanded, to obtain a greater number of proposed activities, raised debates, and different positions, enriching the debate. Finally, the inclusion of greater resources available for the creative elaboration of activities can enhance the diversity of proposed activities, resulting in a broader range of results, with more data to be analyzed and, subsequently, studied.

IV. Final Considerations

This work presented an experience report of instructors in personalized gamification training in an unplugged context with 15 teachers. The objective of this training was to guide teachers on how to gamify their classes in an unplugged way, regardless of the context. In future work, we intend to replicate this training over a longer period to deepen the discussions during the activity.

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