

Use of the gamified digital platform Classcraft® as a strategy for the teaching of cell biology in higher education



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Sâmela da Silva Santos

Undergraduate Student in Biological Sciences;
Federal University of Espírito Santo (UFES)
E-mail: samela1998@outlook.com

Barbara Ross Poey's Hyacinth

Undergraduate Student in Biological Sciences;
Federal University of Espírito Santo (UFES)
E-mail: barbarapoey's1@gmail.com

Pedro Henrique Santana Figueiredo

Undergraduate Student in Physical Education;
Federal University of Espírito Santo (UFES)
E-mail: pedroh.figueiredoh.2000@gmail.com

Helder Mauad

PhD in Physiological Sciences (FMRP-USP);
Full Professor - Federal University of Espírito Santo
(UFES)
E-mail: hmauad@terra.com.br

Márcia Regina Holanda da Cunha

PhD in Physiological Sciences (PPGCF-UFES);
Associate Professor 4 - Federal University of
Espírito Santo (UFES)
<https://orcid.org/0000-0002-7087-9482>
E-mail: marcia.cunha@ufes.br

ABSTRACT

Due to the health context experienced by the COVID-19 Pandemic, in the years 2020 and 2021, digital platforms as well as virtual learning environments, Google Meet and Google Classroom, were the main communication tools between students and the teacher. In this scenario, advances in the use of digital and multimedia tools have contributed to the construction of a range of possibilities for the teaching-learning process.

Linked to this, the use of gamified digital platforms can make a more stimulating and pleasurable task, causing greater engagement, interaction, and emotions, in addition to favoring the inclusion of technologies in the teaching-learning process. The education-focused gamified digital platform Classcraft® offers an approach that engages students by combining elements of role-playing games with the educational environment, creating an immersive and interactive experience.

Thus, this study aims to analyze the use of the gamified digital platform, Classcraft®, as a strategy for the teaching-learning process of the students of the first period in the discipline of Body, Movement and Biological Knowledge offered to the Physical Education courses of the Bachelor's and Licentiate modalities of the Federal University of Espírito Santo in the academic semester 2022/2. For data collection and analysis, three forms were applied throughout the semester with the objective of describing the profile of players of the analyzed classes, evaluating the use of the digital platform regarding usability and player experience, as well as investigating the perception of students in relation to the methodology used.

The results of the present study reveal that the use of the gamified platform Classcraft® in higher education provided a positive experience to students, stimulating their engagement, learning and reflections. However, we have identified some areas that can be improved in the use of this platform. These findings are a starting point to further improve the implementation of gamification strategies, contributing to the advancement of education in higher education.

Keywords: Digital platforms, Gamification, Teaching-Learning Strategies, Higher Education, Technologies.



1 INTRODUCTION

It is remarkable that the social, economic, technological, cultural, and political transformations of recent years have impacted numerous areas of society. Therefore, education is also a product of these transformations, as well as higher education institutions, with all their processes and subjects that constitute it, as well as the teaching-student-knowledge relations and teaching practices.

Thus, much is debated about the role of the student and the teacher in the teaching-learning process. For a long time, the protagonist of this process was concentrated on the teacher, who in this context, assumes the role of holder of all knowledge. This pattern, still frequent in the educational environment, even if functional, no longer follows the demands of modern society. In this sense, an innovative education is sought, in which the focus is on learning, evidencing the protagonist of the student (Moran, 2004), by rethinking the space of the classroom and including access to new technologies as well as the use of virtual learning environments, makes the content more accessible to new generations.

With the advancement of technologies, it is noted that social relations, increasingly, are conditioned to technological tools such as social networks and communities in messaging applications. Through the eyes of Castells in his work "The Network Society", published at the turn of the century (1999), the author denounces that the society of which we are part has developed under the logic of networks. In this perspective, two centuries later, the term "platform society" created to describe the role that digital platforms have occupied in society has been consolidated (Belli and Zingales, 2020). A very clear example are the social networks and search engines, such as Whatsapp, Instagram, Twitter, TikTok and Google that have revolutionized the forms of communication and search for information.

As for the educational environment, it is evident the progress over the years in relation to the access and acquisition of technological resources for educational institutions, such as computers, projectors, among other equipment. However, this is still resistant to the inclusion of technological resources in its methodological procedures.

However, in the context of the COVID-19 Pandemic in the years 2020 and 2021, the digital environment has become the only possible alternative to continue teaching. Control measures adopted to curb the spread of the virus, such as social distancing, have affected numerous sectors of society, including the education sector. On March 17, 2020, the Ministry of Education (MEC), authorized by Ordinance No. 343, that face-to-face classrooms be replaced by digital means, in federal universities and in private institutions of higher education adopting "remote teaching". For the establishment of this teaching modality by the Federal University of Espírito Santo (UFES), the central administration together with the academic community and the Council for Teaching, Research and Extension (CEPE), approved on August 18 Resolution No. 30/2020, which regulated and implemented the Temporary Emergency Remote Teaching-Learning (EARTE) in September 2020.



At this time, digital platforms such as Virtual Learning Environment (VLE / UFES), Google Meet and Google Classroom were the main communication tools between students and the teacher. And despite concerns about access to technological tools and instruction for the use of digital resources, these changes, even if emergency, in the approach to the teaching-learning process have made it possible, if not essential, to explore the digital environment.

The pandemic evidenced the lack of inclusion of Information and Communication Technologies (ICTs) in the educational routine and. on the other hand, the activities in the remote environment provided advances in the use of these tools, a process that contributes to expand the possibilities for the teaching-learning process. To recognize the space that technologies occupy in society, in general, is to recognize what skills and competencies need to be stimulated in the educational environment, such as autonomy, criticality and problem-solving capacity.

It is important to mention that digital platforms for teaching are already widely used in Distance Education (EaD), understood as an educational modality that can occur through technological resources and has spatial and/or temporal flexibility. From this perspective, with the growing development of digital technologies, distance education has occupied contexts such as training courses, technical courses, language courses, in addition to higher education.

It is evident that only the use of ICTs, multimedia resources and virtual environments do not guarantee learning, which depends intrinsically on motivation, as addressed by Deci and Ryan (1985, 2002) when they propose the Self-Determination Theory (TA). This theory points out that motivation is *a continuum* between the reward and the challenge proposed by a given activity, being the support for growth, psychological integrity and social cohesion. In this same field, the psychologist Mihaly Csikszentmihalyi, through his work "Flow: The Psychology of Optimal Experience" published in 1990, shows that by experiencing an engaging and immersive experience the individual can reach a plateau of satisfaction that the author defines as *flow* or flow state, which would be the balance between pleasure when developing a challenging task and the skills to develop it. This becomes clearer by observing the mechanics of games, whether digital games or not, during the game players when in a state of flux do not notice the passage of time. So, would it be possible to awaken this state of flow during the learning process?

It is known that the practice of playing is intrinsic to the human being, and is an activity that triggers the state of flow, as well as reaches the level of motivation sufficient to cause a change of state. In this context, when playing, the player needs to explore their best skills and competencies that vary from player to player.

Therefore, according to Marczewski (2014), there are six categories that are based on the behavior and preferences of players, such as: players motivated by dominance, those who like to look for challenges to be overcome, these are called Archiver. Already, players who want to break the rules



and force a change be it positive or negative are called Disruptor. While players who are motivated by creating things and exploring the system are called Free Spirit. The Philanthropist, are motivated by a collective purpose and do not stick to the reward, while the Players, are motivated by the rewards and do what is necessary to obtain it. Those who are motivated by the relationships the system can provide are called Socialisers. On the other hand, each player can identify with one or more typologies, so Marczewski (2014) created a series of twenty-four questions that make it possible to identify the type of player predominant in each profile observed.

In addition, it is possible to notice that each game, in addition to having skills to overcome the challenges proposed, has its own characteristics, such as card games, digital games, board games. Thus, Werbach and Hunter (2012) pointed out that the elements that make up a game can be classified into three dimensions with regard to the level of abstraction: dynamics, considered the highest level of abstraction of game elements, are defined by the author as the themes around which games will be developed, such as the narrative of a story in role-playing games. The second category is the mechanics, which are characterized as the tools that determine more specific actions of the players, such as the possibility of the player to collect items along a course. The components, third category, refer to the most concrete elements of the game, these will be visualized and used in the game interface, such as avatars and ranking. It is possible to combine these three dimensions including the amount of elements according to the degree of freedom that is desired for the player, objective of the game or according to the player profile that is intended to be achieved.

Therefore, the elements of games can be applied in various contexts, which is already quite common in areas such as education, marketing, training people and work environments. This method is known as Gamification, translated from the English Gamification, conceptualized by the British programmer Nick Pelling, in 2003, refers to the use of elements, mechanisms, dynamics and techniques of games in contexts that are not games (Navarro, 2013). Lopes (2015), adds that:

"... Gamification can be defined as a strategy of interaction between people and even companies conducted in a measurable, interactive and engaging way, using the elements of games in non-playful situations. Therefore, gamification is used to create or enhance a user's experience in front of a product or task, arousing positive emotions, exploring personal skills, rewarding and motivating people."

These gimmicks can then stimulate engagement, interaction, feelings, and emotions that differ from everyday life. Therefore, it is possible to make a task more stimulating and pleasurable by combining the use of ICTs in the educational environment with gamification.

As an example, Khan Academy, a gamified digital platform applied to teaching, uses gamification in subjects such as mathematics, science and programming offering challenges and rewards as students advance in their studies. Duolingo, in turn, uses game elements to make language learning more appealing, offering levels, scores, and challenges to motivate students to practice and



progress in their proficiency. Both models presented are centered on the theory of Flow, characterizing the efficiency of the model in keeping students in an environment in constant discovery and with visible evolution of the learning process. As we move into the twenty-first century, we can expect to see a continued increase in the use of gamified elements in education, harnessing the benefits of digital technologies and the Internet to provide more effective and rewarding learning experiences.

Another example is the gamified digital platform, Classcraft®, the focus of this chapter, focused on education through an approach that combines elements of role-playing games with the educational environment, creating an immersive and interactive experience. By accessing the platform, educators have the flexibility to tailor the platform to the needs of their classroom and the specific content they are teaching. Access to Classcraft® can be accomplished by entering your address in the web browser (<https://www.classcraft.com/pt/>) and performing a simple login. The platform is designed to be accessible on both desktop and mobile devices, facilitating teacher-student interaction. This offers features such as custom avatars, maps, ranking, rewards system, store, in addition to the forum that was used for questions and most important announcements (CLASSCRAFT, 2023).

However, it is worth highlighting some academic studies on the Classcraft® platform to evaluate its effects and benefits on elementary education, exploring the use of the platform and its impacts on student behavior, engagement, and academic performance. In this way, Sanchez et al (2017), based on results of experiments conducted in France and Quebec, highlight the importance of considering the students' experience, rather than the game itself, when implementing gamification strategies using the Classcraft® platform. That is, to create a reflective learning environment, in which the interactions and the meaning of the activities are transformed into a non-essentialist view of a game, generating a metaphor that promotes the creation of a playful environment that stimulates engagement and reflection in students.

Moreira et al. (2022), demonstrated that the use of the Classcraft® platform as an engagement strategy, promoted motivation in students and increased their involvement in the context of the discipline of Software Quality, noted that by adopting gamification, students could be better prepared to face the frequent challenges encountered in software development, contributing to better academic performance in this specific area.

Thus, the present study aims to analyze the use of the gamified digital platform, Classcraft®, as a motivational strategy for the teaching-learning process of the contents of cell biology and histology in the Physical Education courses of UFES.

2 METHODOLOGY

This is a qualitative-quantitative study of a descriptive nature elaborated through a teaching project associated with the discipline Body Movement and Biological Knowledge, taught to the



students of the first period of the Undergraduate course in Physical Education in the modalities Bachelor and Licentiate of the Federal University of Espírito Santo (UFES). The main objective of the discipline is to discuss the structural and molecular aspects of the cell in addition to the structures and functionality of human tissues. This work was developed from the approval of the teaching project by the Pro-Rector of Undergraduate Studies (PROGRAD/UFES), the data collected in this study refer to the semester of 2022/2 with the participation of 77 students enrolled in the discipline, among the undergraduate and bachelor's degree courses.

2.1 STRUCTURING OF THE DISCIPLINE: BODY, MOVEMENT AND BIOLOGICAL KNOWLEDGE

The subject, mandatory for all students of Physical Education courses at UFES, has 60 hours of semester workload. For the learning evaluation process, according to the UFES regiment, the student is considered approved in the discipline with seventy percent (70%) of use of the content of the evaluations scheduled at the end of the presentation of the Cytology and Histology blocks. The content taught in the classes, the asynchronous activities, the complementary material and the bibliographical references used in the discipline were described in the teaching plans and all the material was made available through the Classcraft® digital platform. This is free to use and offers users gameplay through RPG (role play games), fostering the commitment and collaboration of the team. The presentation of the discipline on the Classcraft® platform, was initiated through a narrative that allowed students to understand the contents to be studied, the cells, cellular components and tissues in association with their characteristics and functionalities in the human body, The title of the story: A Journey to the Cells of Human Movement.

2.2 PLANNING OF ACTIVITIES

The activities of the discipline, practical and theoretical classes, were developed in an integrated way to the use of the digital platform. The teaching plan of the discipline was the tool used to guide the teaching-learning process that was presented and distributed as follows:

a) The content made available on the digital platform was associated with the layout of the discipline and was presented to create an immersive and engaging experience, using thematic islands that refer to a fictional world. These islands represent the different locations where the contents of the subjects are allocated, providing students with a sense of exploration and progression in the learning environment. Islands are usually divided into different areas or sections, corresponding to the different topics or content units of the discipline. Students can navigate between the islands and explore the areas corresponding to the specific contents, these were divided into five sequential islands and were in line with the topics addressed in the classroom (Figure 1).



Figure 1: Arrangement of content on the Classcraft® platform. a) general map; b) Island 1 activities; c) Island activities 2.



b) Different online activities were elaborated and inserted in the Classcraft® platform based on the free domain criteria, among them the Quizz application and programs/websites used for the creation/editing/display of graphic presentations (Educaplay, PowerPoint and Canva). The activities were used as a tool for review, deepening of the content and/or evaluation, with voluntary participation, with extra scores to the students.

2.3 DATA COLLECTION AND ANALYSIS

Mattar and Ramos (2019), Cislighi (2008) and Feitosa *et al* (2014) agree that the use of digital technologies in the teaching-learning process can lead to greater motivation and involvement of students in their activities, on the other hand it is necessary to monitor indicators that enable a systematic collection of data the evaluation and correlation of these phenomena. In this sense, three forms were developed and applied throughout the semester to describe the profile of the class, evaluate



the use of the gamified digital platform Classcraft® and measure the perception of students through the proposed methodology.

2.3.1 Player Types

To identify the predominant player profile in the classes and to survey demographic data (gender and age group), an online questionnaire was applied with voluntary participation at the beginning of the school semester entitled: "What type of player are you?" this was elaborated through the Google form.

Based on the methodology proposed by Marczweski (2014), the form was described by twenty-four questions with five alternative answers that vary between the level of agreement (Strongly disagree, Disagree, Neither agree nor disagree, Agree and Totally agree) according to a Likert scale (5 points). For each student it is possible to identify a predominant type of player and the secondary ones, therefore, to determine the profile of the predominant player in the classes, only the answers "I totally agree" for each question were considered and it was decided to consider the values of relative frequency, for the presentation of the results.

2.3.2 Evaluation forms: BioSac

In the middle of the 2022/2 academic semester, students were invited to participate in an evaluation of usability and gaming experience on the Classcraft® platform (PINELLE, 2009 and NECKE, 2010). This evaluation was carried out in person and voluntarily, using a form entitled BioSac containing open and closed questions to describe the experience with the use of the platform. The closed questions were formulated based on a double alternative scale (agree or disagree) of answer.

Qualitative data were requested from the students through the description of three keywords that were related to the students' experience of using the platform.

2.3.3 Methodological Evaluation of the Discipline

At the end of the 2022/02 academic semester, students were invited to answer the form, voluntarily, referring to the methodological evaluation through qualitative data through open questions, where they could express their opinions, describe their experiences in addition to giving suggestions, criticisms and make comments for the improvement of the gamification methodology.

This combination of descriptive analysis of quantitative data and interpretive analysis of qualitative data allows to obtain a more comprehensive understanding of the use of gamification as a tool of the teaching-learning process of cell biology and histology in higher education.

The presentation of the results expressed in percentage and relative frequency, allows the overview of the patterns and trends present in the quantitative data collected. While the qualitative



data, present content analysis with the objective of identifying themes, patterns and emerging categories in the open answers of the participants.

3 FINDINGS

3.1 SAMPLE

The results presented refer to the undergraduate and bachelor's degree classes of the Physical Education course of the Federal University of Espírito Santo enrolled in the discipline Body, Movement and Biological Knowledge in the academic semester of 2022/2. In total, 77 students were enrolled in the discipline between the two courses, bachelor's degree (n=37) and licentiate (n=40), respectively. However, it is important to note that the number of participants who answered the questionnaire was different between the bachelor's (n=34) and licentiate (n=27) courses.

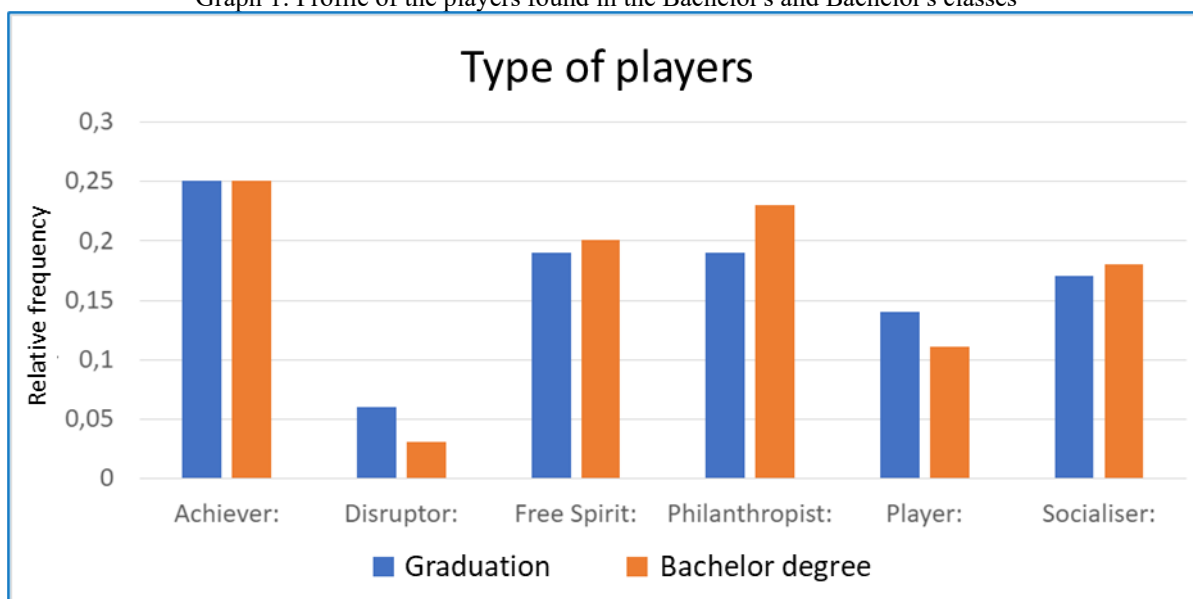
Regarding the profile of the students of the bachelor's and licentiate courses, regarding gender, we observed that 58.8% and 48% are male and 41.2% and 51.9% female, respectively. And in relation to the age group we obtained the following distribution in the bachelor's degree course, 52.9% between 16-20 years and 29.4% between 20-25 years, while 17.7% have an age group equal to or greater than 26 years. In the undergraduate course, 51.9% between 16-20 years, 33.3% between 20-25 years, while 14.8% age group equal to or greater than 26 years.

3.2 TYPES OF PLAYERS

The results regarding the analysis of the profile of the players are presented as values of relative frequency (fr), thus allowing the distribution and classification of the profiles among the students of the bachelor's and licentiate courses, respectively, Archiver (0.25 and 0.26), Free Spirit (0.19 and 0.20), Philanthropist (0.19 and 0.22), Socializer (0.17 and 0.19), Player (0.14 and 0.11) and Disruptor (0.06 and 0.02) (Graph 1), We did not observe in the statistics, a significant difference between the profiles of the players of the students of the bachelor's and licentiate courses.



Graph 1: Profile of the players found in the Bachelor's and Bachelor's classes



3.3 BIOSAC

In table 1, we can observe the distribution of the percentages that characterize the criteria of usability and experience of the player in the Classcraft® platform, based on the responses of the students of the bachelor's and bachelor's degree courses. Regarding usability, about 75% of the students of both courses recognized that the deadlines for delivery of the proposed activities were sufficient, and they found the platform easy to use due to its intuitive layout. However, it is noteworthy that only 21.7% of the students of the bachelor's degree course and 28.6% of the students of the undergraduate course used important features of the platform, which consolidate its gamification proposal, these features include game elements such as avatars, diamonds and the platform forum.

Regarding the experience of students in the use of the Classcraft® platform, it is observed approximately 50% of the students of both courses, bachelor's and licentiate, highlighted that the problems found in the platform were not solved through the forum, thus corroborating the results presented in the usability criterion. It is also worth mentioning that approximately 60 to 80% of the students of both courses perceive their own progress during the use of the platform.



Table 1: Responses to the Biosac form regarding usability and player experience while using the platform. *forum=chat chat used to ask questions and announce important announcements.

Distribution of percentages			
		Biosac	
Criteria	Questions	Graduation	Bachelor degree
Usability	The deadlines for fulfilling the proposed activities are sufficient to carry them out	71,4	82,6
	Have you used the platform's forum?	52,4	47,8
	Are the functions and layout of the platform intuitive and easy to use?	73,1	75,0
	Have you ever used your avatar's diamonds?	28,6	21,7
Player experience	If you have used the forum, has your problem been resolved?	57,1	52,2
	Is the language used on the platform clear?	95,2	82,6
	Are you satisfied with the monitors' feedback?	85,7	73,9
	Do you identify your progress on the platform?	66,7	69,6
	In your opinion, is the platform a promising path for the discipline?	76,2	87,0
	Do you feel more motivated when performing the activities?	61,9	73,9

Regarding the qualitative analysis, students were asked to inform through three keywords the overview of their experience with the Classcraft® platform. The most cited words among the students of both courses, bachelor's and licentiate, were: Learning (10), Interesting (9), Legal (5), Knowledge (5), Challenging (3), Curiosity (3) and Learning (3).

3.4 DISCIPLINE ASSESSMENT

Regarding the evaluation of the discipline, a total of 40 responses were received that represent the variety of opinions of the students about the methodology adopted in the discipline of Body, Movement and Biological Knowledge. They highlight the positive aspects of the practical approach, the integration between theory and practice, the motivation provided by gamification, suggestions for improvements in resources and support, as well as additional comments on the expansion of knowledge and reflections promoted by the discipline. The answers were categorized and to illustrate the methodology adopted, random responses were selected from each category.

A) Positive points

Student 1: "... I really enjoyed it and learned a lot from the dynamics..."

Abulo 2: "... I liked the methodology of the discipline, gamification helps in learning, stimulating and instigating the student in the matter ...",



Student 3: "... The activities during the semester were the great positive point of the discipline, they made us, the students, try a little harder to study and learn the contents presented in the classes...".

B) Suggestions for improvements

Student 1: "... the Classcraft was a bit tricky, I found it hard to use..."

Student 2: "... I found the Classcraft platform confusing and needs improvement..."

Student 3: "... the Classcraft platform was innovative, but very confusing..."

C) Additional comments:

Student 1: "... experience unlike all other disciplines..."

Student 2: "... satisfactory experience with the contents and form of teaching..."

Student 3: "... good experience, I learned a lot from the contents and the way the teacher explained..."

4 DISCUSSION

Active methodologies are teaching strategies that place students at the center of the learning process, allowing them to actively participate in the construction of knowledge. These approaches are flexible, interconnected and hybrid, adapting to the needs and characteristics of students. In a connected and digital world, active methodologies manifest themselves through hybrid teaching models, combining different approaches. This combination of active methodologies with flexible and hybrid models brings significant contributions to the design of contemporary educational solutions for today's students. (Yaegashi, 2017). For Haguenauer (2005), teaching methods can be associated with an increase in creativity and intelligence of students and, therefore, it is necessary to modernize education to accompany the transformations that contribute and innovate the teaching-learning process in the academic sphere.

Given the need to promote a discussion with emphasis on these tools and their impact on education, it is justified to conduct studies that can quantify the values of this change and the applicability of new methodologies. According to Pedrosa (2011), the application of active methodologies leads the student to reflect on his work process and to transform his reality, benefiting it, considering that it awakens in him the critical sense and the search for changes in his relationship with himself, with the user and with the general community allowing him to realize that the new learning is a necessary and significant instrument to expand his possibilities and paths.

In this context, the results obtained in the present study corroborate with Landers and Callan (2014), that the gamification methodology can be one of the ways to promote this role with greater enthusiasm and motivation for active participation in the process of construction and collaboration in their learning process. Like other authors, they found positive results in terms of student motivation and satisfaction with the learning experience and highlighted that the use of gamification can promote



a positive impact in different areas of higher education, including improving student motivation, engagement and performance.

However, it is necessary that this approach is planned in an attractive way, but that it also contemplates the needs of the educational context to which it refers (Silva, (2019)). In this sense, several aspects can be examined through the application of game elements, such as: usability (Pinelle, 2009), gameplay (Mohamed and Jaafar, 2010) and the player's own experience (Necke, 2010). Still, according to Necke, 2010, the player experience can be evaluated through several tools, including interviews, qualitative questionnaires and by gameplay heuristic method. According to Mohamed and Jaafar, 2010, it is seen that heuristic evaluation is commonly used, where the product or system is still in the process of development. Therefore, this tool makes it possible to map the usability and experience with the product in relation to the use of software being games or not, in order to improve the efficiency of the same.

To contribute to the discussion about the use of gamification as a motivational factor associated with digital technological resources in education, the results regarding the use of the platform were categorized into usability and player experience. Gamification and the use of digital resources are considered two approaches with ascending prominence in the education of the XXI century, providing new connections in the form of the teaching and learning process. According to the results obtained, about 65% of the students stated that they feel more motivated during the teaching-learning process, in addition to seeing their own progress when using the gamified digital platform Classcraft®. Therefore, applying elements and dynamics of games in educational contexts, makes the learning process more engaging and motivating and by associating digital technological resources such as the platforms and / or applications used in teaching, can show a significant impact on the way students communicate and access information.

Remote learning has accelerated the constant use of new technologies, accentuated interactions between teachers and students through video conferences, digital platforms and online communication groups. This process was experienced at EARTE/UFES, with the transition to remote teaching and the increased use of digital technologies, as well as the insertion of new approaches that have been explored in higher education. Pereira *et al.* (2021), investigated the implementation of remote teaching in the university context during the COVID-19 pandemic, highlighted that in addition to the adaptation of teachers to new technologies, digital resources promote the active participation of students, such as discussion forums and collaborative activities, seeking to maintain quality and interactivity in educational practices.

Johnson *et al.* (2016), highlights another important role that digital technological resources offer, the personalization of teaching, enabling a more individualized learning for each student, according to their pace and learning style and allows the teacher to improve their techniques and



interventions in the process without leaving aside the alignment to the pedagogical objectives and considering the characteristics and needs of the students.

Regarding the use of the platform, the results of this study indicate that approximately 55% of the students used tools such as the platform forum and about 75% of the students agree that the term of the activities was sufficient for their realization, as well as 55% of the students who resorted to the forum for doubts, these were resolved. Another important point of the results of this study concerns the characteristics such as the profile of the player that also influence the adherence and engagement of this proposed methodology. The results indicate uniformity regarding the profiles of players found in the studied classes. Hassan et al.; 2019 and Klock et al., 2020 showed that it is relevant to personalize the learning experience, and explored the relationship between students' player profile and their performance in a gamified environment. The results revealed that different types of players presented different preferences and behaviors during the learning process. However, there is no consensus in the literature about this direct relationship and effectiveness in the engagement process. According to Andrade (2018), it is not possible to state that personalized gamification provides greater engagement than non-personalized gamification, but the results suggest that users who stay longer in the system have greater engagement in a personalized environment. Thus, understanding the profile of the player can help educators in adapting gamification strategies, offering appropriate challenges and personalized stimuli for each student.

According to Brusilovsky (1996), in an individualized model that considers the objectives, preferences and knowledge of each player, the adaptation and interaction according to their specific needs is facilitated. It is essential to recognize that each player has a unique profile, which influences their way of presentation and use of resources, allowing to identify the most relevant information for each profile.

The use of digital technologies by current generations has been widely documented (Habowski, 2019; Habowsky, 2020; Grinspun, 2016) and point out that young people are increasingly immersed in digital environments, using mobile devices and participating in online communities. In this context, electronic games have played a significant role, as they offer an attractive and familiar language for young people, arousing their interest and involvement. This preference for the language of games in the learning process has also been the subject of recent studies. Kebritchi et al. (2017), have shown that gamification in education can increase student motivation, improve engagement and promote a more dynamic and interactive learning environment. Through elements such as challenges, rewards, and progression, educational games offer a playful and effective approach to teaching and learning. On the other hand, one of the limitations found in the application of the proposed methodology was the use of reward resources provided by the platform, only 25% of the students used the diamonds. Finally, it is important to mention that the open answers contribute to evaluate the application of the



proposed methodology and elucidate a more effective way to later use this platform, providing the necessary feedback to improve the effectiveness of the proposed methodology.

5 FINAL CONSIDERATIONS

Based on the results presented, it can be concluded that the use of the gamified digital platform, Classcraft®, had positive impacts on the experience of first-period students of the bachelor's and bachelor's degree courses in Physical Education of the Federal University of Espírito Santo, stimulating engagement, motivation, learning and reflections. However, the work also points out that improvements are needed in the exploitation of the resources available on the platform and in the resolution of identified problems. These results may provide subsidies for future investigations and improvements in the implementation of gamification strategies in higher education.



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