

**BJGH**Brazilian Journal
of Global HealthRevista Brasileira
de Saúde Global

Gamification as an educational strategy for teaching Oncotic Cytology

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ABSTRACT

OBJECTIVE

To evaluate and report the use of a memory game as an active methodology (gamification) in teaching Oncotic Cytology to undergraduate Biomedicine students.

METHOD

Experience Report. During the course, the students had skills training sessions supervised in the laboratory during practical classes. Among the expected skills, the knowledge of differentiating the cell morphologies of the cells of the endocervix, ectocervix, squamo-columnar junction and microscopy are paramount for the formation of the skills of the future health professional. Thus, the students took part in an activity using a memory game and the time taken by each group to complete the round was evaluated, as well as the number of correct answers when joining the pairs of cards. According to Resolution No. 510/2016 of the National Health Council (CNS), research that is intended exclusively for teaching purposes is exempt from ethical assessment by the CEP/CONEP system.

RESULTS AND DISCUSSION

The results showed that the skills learned in practical lessons were applied in the game, taking an average of 10 minutes each round to complete the memory game with 32 cards. The integration of the students showed that gamification can be considered an efficient didactic resource, capable of promoting integration and raising the quality of the teaching-learning processes, in the development of the skills that are required in the disciplines of health courses and in the development of a critical vision of the future health professional.

CONCLUSION

The students' interaction with the memory game in this report presents a possibility of integrating an active methodology, capable of providing student self-assessment during the activity, as well as providing immediate considerations on the skills acquired throughout the Oncotic Cytology discipline.

KEYWORDS

Active methodologies; Gamification; Oncology cytology; Skills; Biomedicine.

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DOI:

INTRODUCTION

Health Education in Higher Education is a practice that is constantly debated, due to the need to train quality professionals for the job market, and in a challenging way, to seek new teaching strategies that are able to stimulate the teaching-learning process of students.¹

Therefore, for the training of these future professionals, there has been much discussion about the introduction of active methodologies in higher education, with the aim of exercising students' professional skills and competencies in a meaningful way that corroborates the demands of contemporary society, whose perspectives run counter to traditional teaching.²

Throughout their undergraduate studies, students develop the skills and technical-scientific mastery required of health professionals, so that they are able to implement, solve, create and evaluate strategies that will be incorporated into their daily professional lives in the future.¹ However, it is necessary to establish innovative strategies in the educational process, capable of having a positive impact not only on the methodology used by the teacher, but also on the way students are stimulated and taught.³

In this context, innovative actions can be used as tools associated with pedagogical methodologies, proposing new ways of approaching content and promoting student learning in a dynamic, playful and efficient way.³ In this case, creativity can be a teaching strategy that moves away from traditional lectures and begins to implement a process of building knowledge between teachers and students. Some resources that can be used are group dynamics, software and applications, educational games, group dynamics and other approaches that increase student interaction and integration with the subject.⁴

The evolution from a traditional teaching model to a more dynamic and interactive model can be seen as a significant change in contemporary pedagogy, an example of which is the integration of technological tools to complement the educational experience.⁵ Among the possibilities for active methodologies, gamification has emerged as a very interesting tool.

Gamification involves game principles in educational contexts, with the application of elements capable of motivating, enabling group interactions, facilitating learning and engaging students.⁴

With gamification as an element of the active methodology, this tool was chosen to help learn about Oncotic Cytology, presenting the findings inherent to the theme of pathological agents, but establishing an activity with a shorter execution time, complexity and volume of information appropriate to the content of the class and motivating students to learn in a playful way.

The process of teaching and learning are interrelated and gamification helps in the simultaneous action of this activity, and in this context, the application of a game in the classroom favors the development of memorization, retention and construction of knowledge.⁶

In order to use gamification effectively, it is necessary to clearly establish the objectives, define the appropriate challenges and enable feedback at the end of the game that promotes the student's continuous progress, thus complying with all the systematics involved in this methodology.⁷

The aim of this study was to evaluate and report on the use of a memory game for teaching pathogens, in the teaching of practical activities in the subject of Oncotic Cytology. In addition, the evaluation of the effectiveness of the application of this method in the classroom has the main function of assisting practical classes during the observation of slides under a microscope.

Method: experience report

The skills training sessions for the Oncotic Cytology course were held during the sixth semester of 2024, offered by the Biomedicine undergraduate course at the Facens University Center. The subject is part of the course curriculum and is offered in the 6th semester, with a semester workload of 120 hours, of which 60 hours correspond to practical activities and 60 hours to theory.

Among the skills developed in the course are the handling

of laboratory materials and equipment, such as cervicovaginal smear slides, Papanicolaou staining kits, cervical brushes, Ayre's spatula and speculums, as well as knowledge of how the microscope works, in order to acquire psychomotor skills for its correct handling. Throughout the semester, the students carried out practical activities to train their microscopy skills, identifying cell morphology, the presence of pathogens and malignancy criteria.

Skills training includes viewing oncotic cytology slides under a microscope, identifying and evaluating the smear based on drawings and photos, using standardized instruments in the form of checklists, which list the steps for carrying out each of the procedures in the station rotations.

The development of skills is validated by the teacher's demonstration of the correct technique, followed by individual and then group practice by all the students at each of the stations and fully supervised by the teacher in charge, with feedback on mistakes and successes.

In addition to practicing in laboratory classes, the students carry out gamification activities in the classroom as a tool for self-assessment of the knowledge and skills acquired in practical and theoretical classes, allowing for considerations from the teacher and interacting with other classmates, making for an exchange of knowledge, since the activity is carried out with group interaction.

With a view to carrying out a practical activity in the theory class as a learning strategy, using an active methodology, a memory game was developed, consisting of 32 cards containing cells from the ectocervix and glandular cells of the cervix, as well as pathogens, as shown in figure 1 below.

Figure 1 - Cards from the Oncotic Cytology memory game, forming one of the pairs of pathogens, characterized by the herpes virus.



Source: (Authors, 2024)

To carry out the activity with the memory game, the cards were shuffled and made available with the information face down (Figure 2), arranged on a table and to start the game, the students formed groups of 4 students and one member of each group in turn turned over a card and tried to find the corresponding card (which matched) to the one they had selected.

Figure 2 - Cards from the Oncology Cytology memory game, arranged on the table and turned over to start the game.



Source: (Authors, 2024)

When the pair was formed, the student read out the criteria relating to cell changes, lesions, pathogens and cell morphology (Figure 3). Each time the student found the correct pair, the team kept the cards, and at the end of the game, the team with the most cards won the game. On average, each round took 10 minutes to complete and then the cards were reshuffled so that the next group could play.

Figure 3 - Cards from the Oncology Cytology memory game, representing the cell morphology of the cells observed under the microscope, highlighted to facilitate identification.



Source: (Authors, 2024)

After all the groups had taken part, the teacher assessed their performance in identifying the images by giving feedback. To calculate the grade, the teacher responsible for the subject pre-defined a complementary activity in the form of a report, describing pathogens and cell morphology.

RESULTS AND DISCUSSION

The study of Oncotic Cytology requires the student to know the morphological characteristics of the cells of the endocervix, ectocervix and squamocolumnar junction (SCJ), as well as to recognize the presence of pathogens and be able to identify cellular alterations based on the criteria of malignancies present.

During activities under the microscope, the student needs to operate the equipment correctly, identify all the cells and other structures present in the field of vision and even run the slides to observe the entire smear. Being focused on so many processes, it is important that in another situation they are able to make a self-assessment of the image and definition, made possible by the insertion of gamification.

In addition, this type of approach using games is a way of assessing the biomedical skills acquired over the semesters, since the teaching of oncotic cytology is a result of interdisciplinarity from the start of the course. This can be seen in the knowledge of disciplines such as Parasitology, Hematology, Immunology, Microbiology and Cell Biology.

Bearing in mind that the memory game model was used even before human beings became literate, this approach corroborates Vygotsky's (2007)⁸ sociocultural theory of human development that children who were exposed to challenging activities performed much better when they worked in groups, i.e. social interaction is a fundamental element for learning and gamification creates the conditions for learning to be more effective because it is carried out in groups.⁴

With regard to cognitive learning, Kapp (2012)⁹ formulated the theory that practical experiences and interaction with the environment are the basis for building knowledge, so gamification makes it possible to explore authentic environments and scenarios, providing feedback and constructive discussions at the end.

The students' performance was proven during the execution of the activity (Figure 4), due to the length of each round per group, which did not exceed 10 minutes, and the correct association of the pairs of cards.

Figure 4 - Students interacting in groups with the memory game during a lecture. theoretical lesson.



Source: (Authors, 2024)

Later, it was observed that in the practical classes, when the students were evaluating the slides under the micro-

cope, they often linked the images from the games to the findings on the slides, which indicated the effectiveness of the game based on the memorization of the images and their meanings.

It was also noted that in the practical lesson reports, the students increased the number of photos in the practical lesson and external research records, which shows that the students were more familiar with the images and were confident in including new images, including those photographed using a microscope.

During the practical classes, some students even mentioned that the cells altered by the herpes virus were similar to the characteristics described in the game, which again proves the effectiveness of this active methodology, specifically gamification.

Thus, gamification can be considered an efficient didactic resource, capable of promoting integration and raising the quality of teaching-learning processes, since health education is in a continuous process of reconfiguration, adaptation to new digital technologies, improvement of future health professionals to new technologies and the construction of knowledge, putting the theory learned into practice.

CONCLUSION

The students' interaction with the memory game in this report can be considered a promising action for teaching oncotic cytology, as it helped students interact with other classmates, promoted healthy discussions about the images on the cards and their proper definitions, as well as making it possible to assess the skills acquired not only in the proposed discipline, but also in the other disciplines that make up the Biomedicine course, confirming the effectiveness of including active methodologies in the teaching of health courses.

One limitation identified is that in classrooms with more than 30 students, very large groups will be formed or large numbers of groups playing in parallel, making it difficult for the teacher to evaluate and give feedback.

A future proposal is to develop a new version of the game with criteria for malignancies in cells, to help with knowledge.

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