Augmented Reality Technology Associated with Gamification in the Educational Process: Practical Research in the Basic Computer Laboratory Discipline at CESMAC University Center

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Abstract—This research aimed to verify the applicability of Augmented Reality (AR) associated with gamification in the discipline of Basic Informatics Laboratory at the University Center - CESMAC, to facilitate the teaching and learning process in higher education. Checking the impression and reaction of participants to this teaching methodology.

Keywords—Teaching-learning. Augmented reality. Gamification. Motivation.

I. INTRODUCTION

The current generation is marked by the usual use of technologies in all areas, whether in the professional, educational, communication and daily fields. This digital age gives a new vision when it comes to using technology as a way to improve existing systems and the resources already used.

The idea of the research arose in view of the need, in addition to generating scientific and current content on the subject, to promote the introduction of these technologies in the teaching-learning process in order to maintain the motivation of students with the innovation of the process. The relevance of the study is based on the innovation of the use of technological devices in the educational area with a focus on the motivation of students, promoting theoretical and practical content in the educational area, which even in the face of technological advances produces little theoretical content on the subject.

Considering education as the basic foundation of human development, a curriculum capable of promoting professional training in line with the demands of the current market, which is increasingly demanding and complex, should be promoted. Currently, it is observed that the educational scenario maintains the reproductive practice of content, cast and without the right to promote an effective formation. In view of the fact, the question arises: Does the use of augmented reality associated with gamification influence the motivation of students being able to facilitate the teaching-learning process?

The main objective of this study was to apply the augmented reality associated with gamification, by involving students of the higher level of digital generation in the acquisition of learning, in the discipline of basic computer laboratory at Cesmac University Center, as well as comparing the students' performance in front of an exhibition class in the traditional methodology and an interactive class using technologies, presenting the applications of augmented reality and gamification aimed at motivating students from the digital generation to learning and verifying, in practice, the effectiveness of the use of Augmented Reality associated with gamification in the discipline of Basic Informatics Laboratory, and had as object the verification of the effectiveness of the application of augmented reality associated with gamification in the performance of students.

In order to confirm whether it is possible to positively influence the motivation of students with the use of technological resources such as augmented reality and

gamification and whether there is the possibility of comparatively measuring this motivation through practical tests.

II. THEORETICAL FOUNDATION

Education has its legal bases in the Brazilian Federal Constitution, which determines the general rules to be adopted in the educational treatment. Focusing on it, as the responsibility of all social entities, making each one act in the sphere of his competence in a complementary way to the others.

Always aiming to combat inequalities and cushion their impacts, where everyone can have access to quality education, the Ministry of Education (MEC) comes with the responsibility of regulating and supervising educational institutions from early childhood education to higher education, including teaching to people with special needs, as well as in the distance modality, and in any age group.

Based on the current context, where globalization prevails and the whole becomes a cornerstone in what pertine to the educational process. Compliance with the reassessment of teaching in higher education is multifaceted and increasingly demanding and crowded. Therefore, the teacher must transmit the contents in order to attract students, making them more practical, always aiming to achieve them in their entirety. They should also have approaches that promote the training of professionals able to fully carry out their activities in the chosen areas of activity.

Almeida points out that current students are already born in constant contact with technological resources, and it is easier to manipulate them, including those from the less favored classes. It is up to teachers along with the educational environment to adapt to this reality and use the technological perspective. When selecting the technological resource to be applied, the educator must pay care for the entire context in which it will be used. Some of these mechanisms are Augmented Reality (AR), applications, and games, which can also be employed in a variety of ways depending on the purpose.

The games are gaining more and more space in the educational area by promoting a dynamic and interactive form of learning, establishing a satisfactory motivational scale. Knowing this, the use of gamification is presented as an appropriate tool and capable of motivating students, by using the game to facilitate and stimulate learning and develop the skills necessary for the training of the student, both as a professional and as a citizen.

Thus, these mechanisms, as long as applied in line with the objectives of the pedagogical project, enable a playful and effective learning, given that students are challenged to compete using their knowledge about the studied subject and, thus, are motivated to interact and learn the contents. Therefore, the use of technology in education is undoubtedly beneficial and effective in building creative and innovative knowledge. The study tried to ensure all the ethical standards required and, according to Prodanov and Freitas, sought to execute all phases of the study in a morally correct manner.

III. METHODOLOGY

Regarding the objectives, the research was classified as exploratory, because it intends to generate conceptualization and more information about the theme. Its profile led to the selection of bibliographic research as the main technical procedure, associated with the application of tests and questionnaires to survey the results obtained.

The study was carried out in the Networking laboratory, located on Campus I of the CESMAC university center, where students of the Information Systems course were invited to participate in the research, duly enrolled, between the 1st period and the 8th period, in the period from November 22 to November 26, 2018, according to the following schedule: on November 22/23, the formal invitation was made to the students, day 24, the class was given under the traditional method and application of the questionnaires, on the 25th the technological class and application of the questionnaires was made and the 26th, the data were performed.

During the application of the study, the researcher was observed, empirically, empirically, a greater interest and motivation on the part of the students during the execution of the technological class. At the time it was observed that during the use of the kahoot tool, during the class with the use of technological resources, the students assumed a posture of interaction and participation, making it more dynamic and interactive.

IV. RESULTS AND DISCUSSIONS

The resources employed and the methodology selected were aimed at confirming the following hypotheses: whether it is possible to confirm and positively influence the motivation of students with the use of technological resources such as augmented reality and gamification, and whether there is a possibility to measure this motivation comparatively through practical tests.

The relevance and justification of this study are based on the innovation of the use of technological devices in the educational area focused on the motivation of students, promoting theoretical and practical content in the educational area, which even in the face of technological advances produces little theoretical content on the subject.

The first analysis corresponds to the survey and compilation of quantitative data, which according to Peixoto and Córdoba, focuses on logical, palpable and measurable reasoning of the results obtained. It was observed through these, that the students presented similar results regarding the performance about subjective (traditional) or objective (technological) questions, pertinent to traditional and technological methods.

Qualitative analysis represents a more complex view of the study, where the complex and inductive side of the study is analyzed. Starting the phase, students were asked to answer an online questionnaire made available in Google Forms. Through the results obtained through it, it was concluded that the technological method promoted greater acceptance and motivation about the content selected to serve as the theme of the class, given, enabling an innovative and interesting resource in the transmission of the content.

V. CONCLUSION

It is concluded that digital technology is a great ally of learning and, it is increasingly accessible and if well managed it is able to enhance learning. This practice inserts novelty in the educational environment and breaks with traditional standards, which promotes a relaxed and effective environment in the production of knowledge, because, as a result of the qualitative question number 8 (eight), of the students who attended the class with the use of technological resources 85.7%, stated that they felt safer and able to respond to qualitative exercise, while only 46.2% of the students who attended the traditional class. This points to the precariousness of the conventional teaching model, requiring the insertion of innovation and motivation in the process.

Considering that the present study was conducted as research and the application time was short, and the contact of students with technological resources was reduced, and even so it was effective and motivating, their definitive and usual insertion in the teaching-learning process in accordance with the pedagogical culture of the educational institution is an efficient means of improving the students' performance.

The results demonstrate the confirmation of the proposed objectives, as well as ratify the hypotheses raised, given

that it was possible to confirm that it is possible to positively influence the motivation of students with the use of technological resources such as augmented reality and gamification and whether there is possibility of measuring this motivation through practical tests.

The relevance of the study is the contribution of research to the academic environment, because it generated current scientific content on the subject, also contributes to an effective education focused on effective and modern professionalization. In view, the difficulties faced when researching current content and practical studies aimed at the production of scientific content aimed at innovative and quality education, as observed that there is still a lot of resistance, both from the educational institution and teachers in inserting technological resources in the educational area.

In a sense, considering the general analysis of the data, that is, qualitative and quantitative, there is a high rate of acceptance by students of the technological method, considered innovative and motivating, facilitating learning and providing a skilled pedagogical resource for the promotion of effective and practical knowledge. Evidencing the methodology as an instrument of great utility in the area of education, where its applicability combined with a good elaboration of pedagogical project is able to introduce a dynamic and effective educational environment.

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