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The Digital Game 'Artesaga' as a Methodological Strategy for Teaching Art History

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***Abstract*—** *Digital games have been presented as mediation tools in the Learning Process area in educational contexts. As such, this article aims to present the educational digital game 'ArteSaga' which allows the learning of Art History in high school. For that to happen, a survey was conducted in IFRN – Campus Parnamirim, in four second grade classes of high school, allowing for the development of software, whose conductive approach is the Design Methodology. This investigation started with a bibliographic research, followed by a questionnaire applied to the students, with the purpose to determine the digital game shaping, and it is developed in C# language and its graphic design created with Raster graphics. The game 'ArteSaga' was created and validated presenting the content related to the Prehistoric and Ancient Art periods, and the final prototype was exhibited at scientific research expositions and scientific and technological events in the area.*

I. INTRODUCTION

The ever-moving, transformative society of which we participate constantly fosters the evolution of the most diverse digital technologies, which in exchange tend to interact, disrupt and significantly change how we live and connect as human beings. Among society segments that have been changing due to the prevalence of new technologies, there is Education. In this segment, digital technologies have boosted significant changes, linked to learning and teaching process, making it possible for the emergence of new theories that extend our comprehension of the processes involved in knowledge acquisition.

Accordingly, in the last years the Virtual Learning Environment (VLE) has been causing a revolution in education and extending the spaces of human interaction, since they interfere in and mediate informational and communicative processes. This way, important tools of knowledge diffusion and democratization of information have been produced, allowing students access to a variety of new technological resources (SUZUKI, 2007).

With the dissemination of these technologies, a new demand arises: the use of technological tools in education to stimulate learning. Damasceno (2008, p. 1), discussing the use of technologies such as digital games, says that "The use of virtual games, as education strategy, is extremely effective to the increase of students' motivation and a powerful educator tool to the teaching and learning process". It is, therefore, noticeable that digital resources and their many interaction tools allow students to be active subjects on building their own knowledge, stimulating a better educational development.

Building from that, we noticed the importance and need of developing a digital game via a virtual learning environment to contribute to students' education in the Visual Arts subject. In a VLE, the interactive interface between students and their learning object is deemed essential for the effectiveness of knowledge absorption.

The digital game 'ArteSaga' is presented as a studying instrument, making possible the teaching and learning processes and putting into practice skills and competences, in a ludic and affectionate way, combined with specific target topics in the Art subject, considering that some of these topics can be as ancient as humanity. As Mattar (2010) explains that "Art is one of the ways encountered by (men) to transcend themselves. It brings men's testimony about their own existence with its complexity and depth."; and in that way, this is a game that has the purpose to instigate the study and interest in Art History topics.

The goal of this research is to develop the educational digital game 'ArteSaga', which proposes a connection between the Visual Arts subject and Art History content, allowing a better learning for the students, focusing on their motivation and comprehension of the worked content.

The game is developed in an interactive way, with the purpose of being used as a methodological strategy for education, enabling content comprehension of second graders of high school at IFRN – Campus Parnamirim that is localized in Parnamirim city, in the state of Rio Grande do Norte, Brazil.

1. The context of Research on Virtual Learning Environment

Communication, technology and education form the fundamental pillars to the formation of humans in the 21st century (FERREIRA; SOARES; LIMA, 2012). For that, the use of VLE has been an interactive technological resource among these pillars, promoting the formation of students and encouraging the transmission of knowledge via appropriate instruments.

As Frosi and Schlemmer (2010) said, the use of Information Technology and Communication has been revolutionizing the ways of teaching and learning, and a way of using them in education happens by means of Virtual Learning Environments. This way, with the advances in programming languages and methodologies over the past century, there has been a significant progress on building VLEs.

There is evidence that the increasing access to VLE on Brazilian schools has been providing a great contribution to the education of high school students, given that almost half of the educators have declared using computers so students may participate in activities in virtual environments (BARBOSA, 2014). That data illustrate the fact that educators understand the importance of the use of technology in schools to the development of the teaching and learning process.

Simultaneously, the young students are the most frequent users of technology in their everyday lives, which results in a big familiarity with this new learning method. Not only that, but the digital games very often provide a way to escape from stress caused by the school activities due to the exhausting learning methods imposed by schools.

This way, in order to contribute with the engagement of students and with the learning of the Art subject, we noticed the importance of developing a digital game through a virtual learning environment with its interactive processes between students and the learning object. Such interaction is essential to the appropriation of the learning process, since the game may be used as an alternative of education to assist on curricular contents and a methodological strategy that helps on the necessary education across the curriculum.

Based on the above considerations, the digital game 'ArteSaga' may act as a learning tool, given that its use may also occur at any given moment, allowing the teaching and learning process and putting in practice skills and competences, in order to be added to the previously acquired knowledge.

2. An educational digital game as a methodological strategy

In Art education, there are some examples of instruments to develop a virtual learning and reading environment. An example for that is the digital game GAMEDUCA (NÓBREGA, 2011), which proposes the development of a multiplayer digital game as didactic instrument to the teaching and learning of Art History, allowing that its users, registered through profiles, act as curators mounting expositions and exercising the practice of critical analysis.

According to Pereira (2016, p. 8), "the use of VLE, allied to other available resources on cyberspace, contributes significantly to the search for improvement of the teaching and learning processes in the Visual Arts subject". This way, such environment has the role to mediate knowledge through elaborated softwares, aiming to ease the learning process, according to Jordão, Martini and Salomão (2007). The authors observed that "the game mobilizes mental schemes, stimulates thinking, time and space ordination; integrate many dimensions of affective, social, motor and cognitive personality" (JORDÃO; MARTINI AND SALOMÃO, 2007, p. 9). This way, it is a space designated for knowledge transmission, besides developing technical and psychological skills among the students and educators involved.

In that context, teenage students are the most frequent users of technology in their everyday lives, which means that they have a big familiarity with this new learning method. As McGonigal (2012) says, "humanity spends

around three billion hours weekly playing. Considering the dedicated time to that activity, it is undeniable that games have a clear appeal in current society." This way, we've come to realize that digital games can be part of school life, keeping in mind the potential to integrate technology with conceptual, procedural and attitudinal contents. According to Paula and Valente (2016),

> Digital games have been finding, more and more, space in Education. We believe that one of the reasons for this option for games is the ability of motivation that these artifacts have. It is considerable that this power of engagement from video games is supported by the pervasiveness of digital games nowadays (PAULA; VALENTE, 2016, p. 11).

In Education, digital games can also be seen as a way to motivate students that are uninterested in school contents and in imposed methodologies. However, they do not have to be accepted with that bias, but as a booster of education contributing with students' engagement on school subjects. For Presky (2001), when considering the importance of learning based in digital games, he expresses that it functions for three reasons:

> 1. The increased engagement comes from the learning process being placed in a game context. This can be considerable, mostly for people that hate learning. 2. The interactive process of applied learning. That can, and should, assume many different forms depending on learning objectives. 3. The manner in which both are united in total package. There are many ways to do it and the best solution is highly contextual (PRENSKY, 2012, P. 209).

However, in this context, it is observable that the use of digital games has grown in high school subjects (DAMASCENO, 2008). So that, in 'Arts II' subject, in 2nd year of high school at IFRN – Campus Parnamirim, students have grouped to propose the development of a digital game for History of Visual Arts content in order to provide an active learning process. Such question is emphasized on the following affirmation,

> [...] the games seem to offer activities that are highly consistent in relation to the modern theories of effective learning proposed by psychologists and educators. The learning from games provide activities that benefit an active learning process, based on experiences, situated, based in problems, that provide immediate feedback, consistent with cognitive theories and involve communities that offer collaborative support to the players while they learn. (BOYLE; CONNOLLY; HAINEY, 2011, p.72 qtd. in PAULA; VALENTE, 2016, p.13).

Finally, educational digital games can be deliberated as interactive and active forms, leading students to develop attention by experiencing challenges that occur at increasing levels, enabling the learner to be offered playful moments and at the same time integrated into the learning processes, since gamification contemplates the use of skills, mechanics, aesthetics and thoughts to adhere people, motivating them to action, promoting learning and solving problems (KAPP, 2012). Students can find through their playful action the meaning of conceptual elements, the visualization of real situations and possible learning outcomes.

II. METHODOLOGY

The research on the development of the 'ArteSaga' digital game has taken place since 2019 and is carried out using the Design Methodology as a leading approach, which presents itself as a process in the development of projects by which a certain result is instigated, being structured in different stages based on methods and tools, with the objective of helping the team in the conception and development of the digital game to be developed. For this, the following phases of the methodological procedure were followed:

1. Bibliographic survey on the state of the art that was carried out from bibliographical research in articles, books, dissertations and theses. Its objective was to compose the investigation of bibliographical references about: educational digital games, the teaching of Art and Art History through new technologies. To facilitate the search, the Google Academic platform was used, a research tool that allows locating academic papers in specific areas in order to develop the theoretical framework established for the study. With the content accessed, the use of digital educational games is currently perceived as a generator of good results with regard to learning the subject content.

2. Application of data collection instruments: elaboration of a questionnaire on Google Forms in order to search the student profile, more specifically, of the four classes of the second year of the integrated high school of the IFRN - Campus Parnamirim, and their appreciations about the game digital 'ArteSaga' as a methodological strategy for teaching Visual Arts.

3. Study and planning of the research project to define analysis and development categories, such as: goals and objectives to be achieved, deadlines, target audience, scope and necessary resources. These steps were structured in line with the educational objective that was established

from the student's motivation to know the Art through the playful game, in order to make him understand the transformations that have taken place in Art from the main periods in the history of visual arts, in order to perceive the founding characteristics present in each moment, in the midst of contact with different artistic expressions through their aesthetic experience, enabling greater student interaction with artistic languages through technology.

4. Anatomy of 'ArteSaga' game modules: definition of mechanics, narrative, aesthetics and technology that are components that make up a game (TEIXEIRA; CRUZ; GONÇALVES, 2016).

5. Game prototype development: physical representation of the intended product. For this stage, the following tools and methodologies were considered: C# (C Sharp) programming language for game construction and development. The historical periods, its setting and the characteristics of the time, as well as the changes that took place in the technological and artistic advancement of the period. The idea is to provide the student player with an experience similar to the appreciation of the work of art in its original context, the observation of artistic images and interpretation. At the same time, the player experiences an eminently playful experience, building a pleasant memory of such practices (RIBEIRO, 2006). In the graphic design stage, the image editing tool was used. For such procedures, the work performed by a team is of fundamental importance for the development of the game: a team responsible for building the game's programming; the second team responsible for building the design and visual identity; and the third team responsible for the script of the story and the texts that comprise the Art History content existing throughout all stages of the game.

6. Script for the game's digital narrative: execution of a script as a tool for organizing, planning and structuring the narrative. The context of the 'ArteSaga' game takes place in a museum where Pablo, the main character, is in a field class with his class and the Art teacher. The events take place as the cutscene progresses and takes the character to experience the main events of Visual Arts throughout history, at first inside the museum and at a second moment already immersed in the period studied. For all historical periods, the player is exposed to the setting and characteristics of the time, as well as the changes that occurred in the technological and artistic advancement of that period. The idea is to provide the student player with an experience similar to the appreciation of the artwork in its original context, the observation of artistic images and their interpretation.

7. Implementation of the digital book that presents itself as an icon on the game screen. When selected, the book opens and the player can have access to content about the history of visual arts that have been played previously. At the end of each phase of the game, the book is opened and complemented, giving access to information about the challenges experienced throughout the playful experience.

8. Presentation of the game in the classroom for pre-test and application of a questionnaire for feedbacks; analysis of the questionnaires. At this stage, the optimization of the game is verified to facilitate its gameplay and its use as a methodological strategy.

9. Development of monthly research report writing and final report writing. Publication of research results and availability of the 'ArteSaga' game on Android, iOS and PC.

The educational digital game 'ArteSaga' has advanced in its creation during the second year of research work (Module I, II, III and IV), but we intend that it advance concretely in relation to the historical periods along the development of Art by humanity.

In view of the entire methodological procedure of the technological investigative project, the innovation proposal is to make the player learn the history and artistic aspects present in artistic periods in a playful way, through minigames and challenges that encourage user learning. In addition, the achievements unlocked by completing the challenges lead the student to the digital book that addresses the module's specific art history content, presenting images, texts and references to complement the exposed subject. Finally, we observe that the game presents itself as a curricular learning tool that provides the improvement of education for Art, enabling greater student interaction with artistic languages and technology.

III. EXPECTED RESULTS

The 'ArteSaga' digital game presents itself as a process in the development of the research project through which data and results are investigated in different stages. Such results achieved in the game, as a methodological strategy, may occur enabling the learning process and putting into practice the student's skills and competences, in order to combine with the knowledge already acquired (MARTINS ET AL, 2020).

The results obtained so far are presented through the following topics: creation, development and validation of the game for the discipline of Art - Visual Arts Project related to the content of Rock Art, Art in Egypt and Art in Greece, which the player has the opportunity to experience adventures exploring the secrets, playful strategies and artistic aspects of each artistic period.

Furthermore, throughout the creation of the game during the research, the development of the 'ArteSaga' digital game created to be used in Art classes through the History of Art content is observed, as shown in the images below:

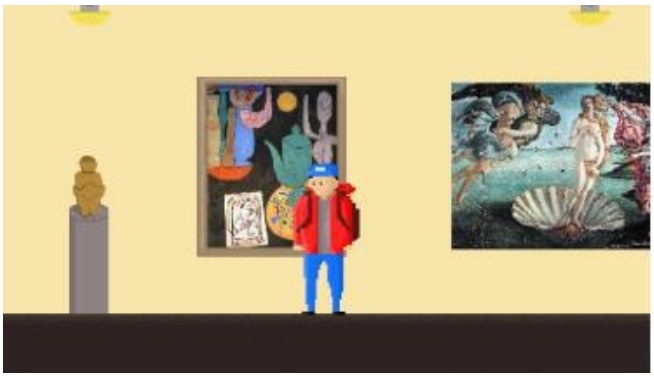

Fig.1: Pablo atthe'ArteSaga'Museum

Source: 'ArteSaga' Game – InitialCutscene.

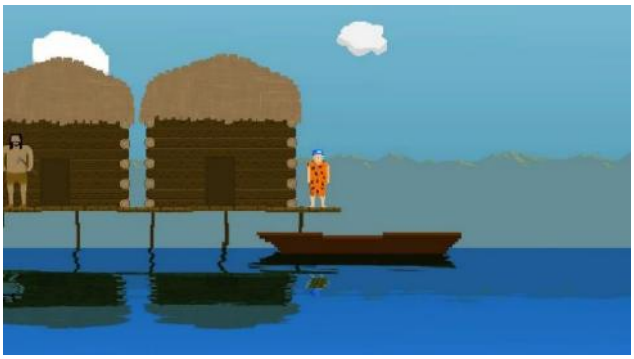

Fig.2: Pablo in prehistory (Age ofmetals)

Source: 'ArteSaga' Game – Rock Art Module.

Figures 1 and 2, above, show the development of the physical representation of Modules I (Introduction and Rock Art). Figures 3 and 4 below present the result of Module II (Art in Egypt and Art in Greece) of the 'ArteSaga' game. For all modules, historical contexts with the characteristics of the time were considered. Scripts were produced with all the scenes and phases of the games to better develop the program and the design that is built, in order to provide a narrative used as a guideline to guide the course of the construction of digital game development.

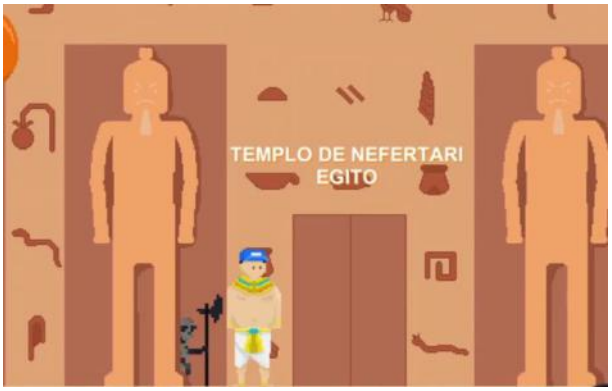

Fig.3: Pablo in theTempleofNefertari (Egypt)

Source: 'ArteSaga' Game – Art module in Egypt.

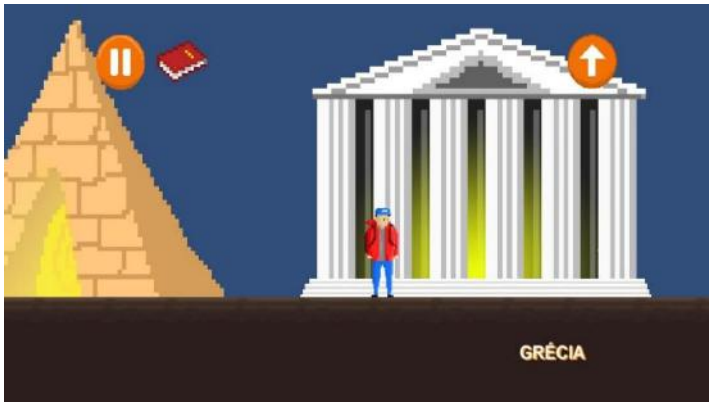

Fig.4: Pablo at the Gateway to Ancient Greece

Source: 'ArteSaga' Game – Art module in Greece.

The digital game 'ArteSaga' advanced in its creation during the first year of work, addressing Prehistoric Art (Module I). In the current project, the content of Art in the Ancient Age (Module II) was added to the game, but we intend to establish it concretely in relation to the historical periods along the development of Art by humanity. We observe that the game is a curricular learning tool that provides the improvement of education for Art, enabling greater student interaction with artistic languages and technology.

As for the dissemination of results, we will establish dissemination goals, through the IFRN-Campus Parnamirim website, media and social networks, as well as submission of articles in magazines/periodicals and participation in local, regional and national scientific events, in order to disseminate and to qualify the work and the institution in the production of knowledge in the field of Art.

IV. CONCLUSION

The accomplished article initially fulfilled its objective which was to present the digital game 'ArteSaga' which allows a better learning, focusing on students' motivation. In this context, it was observed that the digital game 'ArteSaga' will be capable to act as a study tool, once its use also will occur at any moment, facilitating teaching and learning processes and putting in practice skills and competences, in order to be added to the previously acquired knowledge.

Additionally, 'ArteSaga' was evaluated during events and congresses it participated, winning prizes (annexed image) and positive reception by evaluators. It was possible to perceive that by the great approval from students and educators that experienced the game on expositions in science fairs. The game still continues to be developed to cover remaining subjects related to Art History.

This way, however the game has only two finished modules related to Art periods, the game is able to be used as a learning instrument to Art subject in high school. In addition, the developed game has presented great reverence from the target public, according to research done in classrooms and presentations in events.

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