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Immersive Teaching Material of Architectural Memory in Oaxaca, Mexico

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1. INTRODUCTION

Teaching material in any educational system is one of the essential tools for the development and expansion of knowledge applicable in a classroom environment. Therefore, under a deductive and practical methodology, a hybrid memory game will be designed that contributes to the visual teaching of the architectural heritage of the city of Oaxaca, Mexico; supported using immersive Augmented Reality [AR] technology. This preliminary project also seeks to diversify educational strategies, as well as enhance the digital skills and cognitive abilities of participating users.

2. BACKGROUND OF THE PROPOSAL

Games based on interaction, stimulation, and reward between the user and the product allow greater adherence to learning, calling it <content> or <soft> as Bonsiepe (2011) refers to. These recreational products stimulate the release of dopamine, the natural neurotransmitter in all species, including humans, leading them to a state of frenzy; Johnson (2012) argues that dopamine helped us find resources, acquire new knowledge, and innovate.

When considering this measure, it is proposed that the use of immersive technologies in learning activities would allow the visualization of products that include hybrid, interactive, and intuitive content, in addition to providing meaningful experiences. Augmented Reality [AR] in the classroom, say Felip and Galán (2021), makes it possible to understand theoretical concepts that could be too abstract, in turn, it encourages visual memory and the active participation of the user. This consolidates new heuristics learning among young people in training. To this extent, the United Nations (2023) determined that, to achieve educational strengthening, digital cooperation among young people must be promoted, the creation of platforms that enable educational transformation, as well as establishing more efficient technology transfer mechanisms.

3. JUSTIFICATION

To streamline resources and innovation mechanisms towards more efficient and intuitive learning, the teacher needs to rely on teaching material provided by the educational system, since this is an indispensable tool for the development and expansion of knowledge applicable in a classroom environment. However, the teaching process can be an even more complex task if the institution does not have materials that encourage historical memory and the built-in heritage of the environment.

That said, it is the responsibility of academic researchers to propose new methodologies or materials for classroom learning and implement projects that diversify educational activities, with the possibility of extending to other hybrid environments and more inclusive and diverse social groups. Furthermore, this preliminary project proposes to be a model for other educational centres to produce new versions alluding to the heritage and architectural sites of their localities. In this way, says Campos (2013), productions of this type stimulate new ways of relating to the space of the city, highlighting it as a product and producer.

4. SPECIFIC OBJECTIVES

- Arrange the digitized teaching material on a virtual site for free use, downloading,

printing, and correct execution by both students and teaching staff;
- Include complementary information: textual, multimedia and visualization about each of the architectural sites that make up the game set;
- Stimulate and measure cognitive and digital skills among participating users with or without disabilities.

5. GAME MECHANICS AND EXECUTION

The game establishes rules that must be understood at the beginning and followed by the participants during the dynamic. It is worth mentioning that this can be played both individually or with other players. In addition, the number of pairs of cards could vary depending on the grade's desired difficulty. Mechanics: all pieces must be mixed and be placed in a face down position, in such a way that the graphic image is hidden from observers. The participant picks up two cards, if these cards include the same graphic representation, the player keeps them and is allowed to choose two more. Nonetheless, if the cards are different, the player must return them face down and in the same position where they were taken. In this way the cards will be revealed in subsequent turns.

The objective of the game is for one of the participants to accumulate as many pairs of cards as possible, by identifying the graphic pieces and remembering the position where they are located. For the AR version, the same mechanics will be followed, but using patterns and with the support of a mobile device that allows digital visualization of the architectural piece; Additionally, these will include audio that mentions the name of the architectural piece represented.

5.1 Execution

It is proposed to select fifteen buildings with aesthetic-architectural characteristics or with heritage cataloguing in the central region (Central Valleys) of the state of Oaxaca, Mexico, these include the quadrants of the historic centre, and some locations close to the capital city. Once selected, these will be subjected to a process of graphic abstraction, that is, a visual synthesis of the elements that compose them, to interpret them into images of basic representation, such as pictograms.

The next step would be to have each of the pieces vectorized two-dimensionally and then, the patterns designed that will allow the visual representation of AR with the virtual design team. The functions of the prototype will be measured in its two 2D and AR versions, with the aim of applying it in two controlled groups of students: group 1, the 2D printed version in students with or without disabilities; the group 2, using a mobile device for AR in students with or without disabilities, all enrolled in the CAM 52 Multiple Care Center, Oaxaca, Mexico.

Finally, the 15 pieces composed of 30 pairs of letters will be made available in portable document format on a virtual site, which allows the download of this material for physical printing. In addition, the site will provide complementary information about the architectural heritage buildings that make up the game set, as well as instructions for the correct technical and pedagogical use of the material.

6. CONCLUSION

This board game not only aims to be a product for the use of students in training at their different educational levels, but also to be inclusive, embracing different age ranges, digital skills and emotional intelligence of the users, since according to Bonsiepe (2011) inclusive design does not create limitations to the satisfaction of needs, especially the basic needs of the population; referring to user-based innovation to facilitate access to a product or service. It should be noted that the set may be improved, as indicated by the measurements carried out in practice, added to the feedback provided by users through comments and ratings of the material, to achieve optimal quality in its design, structure, usability, and visualization.

7. REFERENCES

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