

LABORATORIORPGDOCENTE: A GAME-BASED LEARNING

K. U. Antela¹, R. S. Hernández¹, I. Adam-Cervera², M. L. Cervera¹, A. Morales-Rubio¹, A. Pastor¹

¹ Department of Analytical Chemistry, Research Building, University of Valencia, 46100 Burjassot, Valencia (Spain)

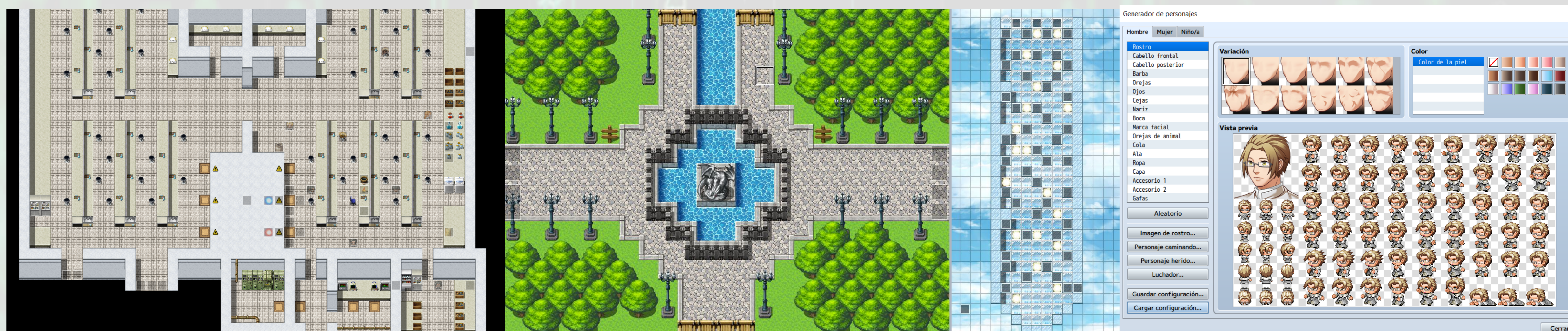
² Institute of Materials Science (ICMUV), University of Valencia, 46980 Paterna, Valencia (Spain)

Introduction

Due to the situation caused by COVID-19 the use of new technologies have become more important, this work proposes the development of a game-based learning to simulate a qualitative analysis laboratory. The created videogame has been evaluated by satisfaction surveys in order to be able to verify the opinion of the students. The results show a very positive perspective of the use of the videogame as educational reinforcement.

Esthetics

- The game has been designed according to the structure and distribution of the Universitat de València.
- Places such as the fountain square or the chemistry building have been recreated, as well as the laboratory for analytical chemistry practices.
- The aesthetics of environments have been designed for minigames that liven up the content.
- A system to select the aesthetics of their character has also been developed.

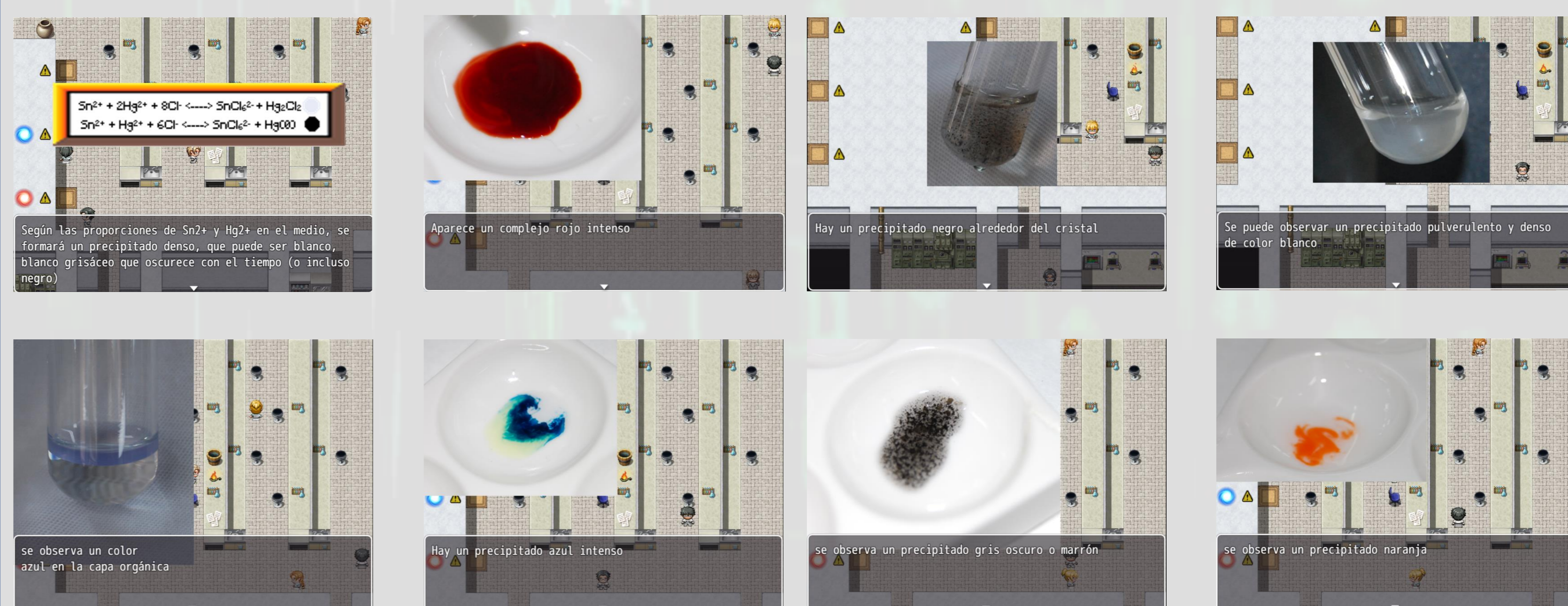
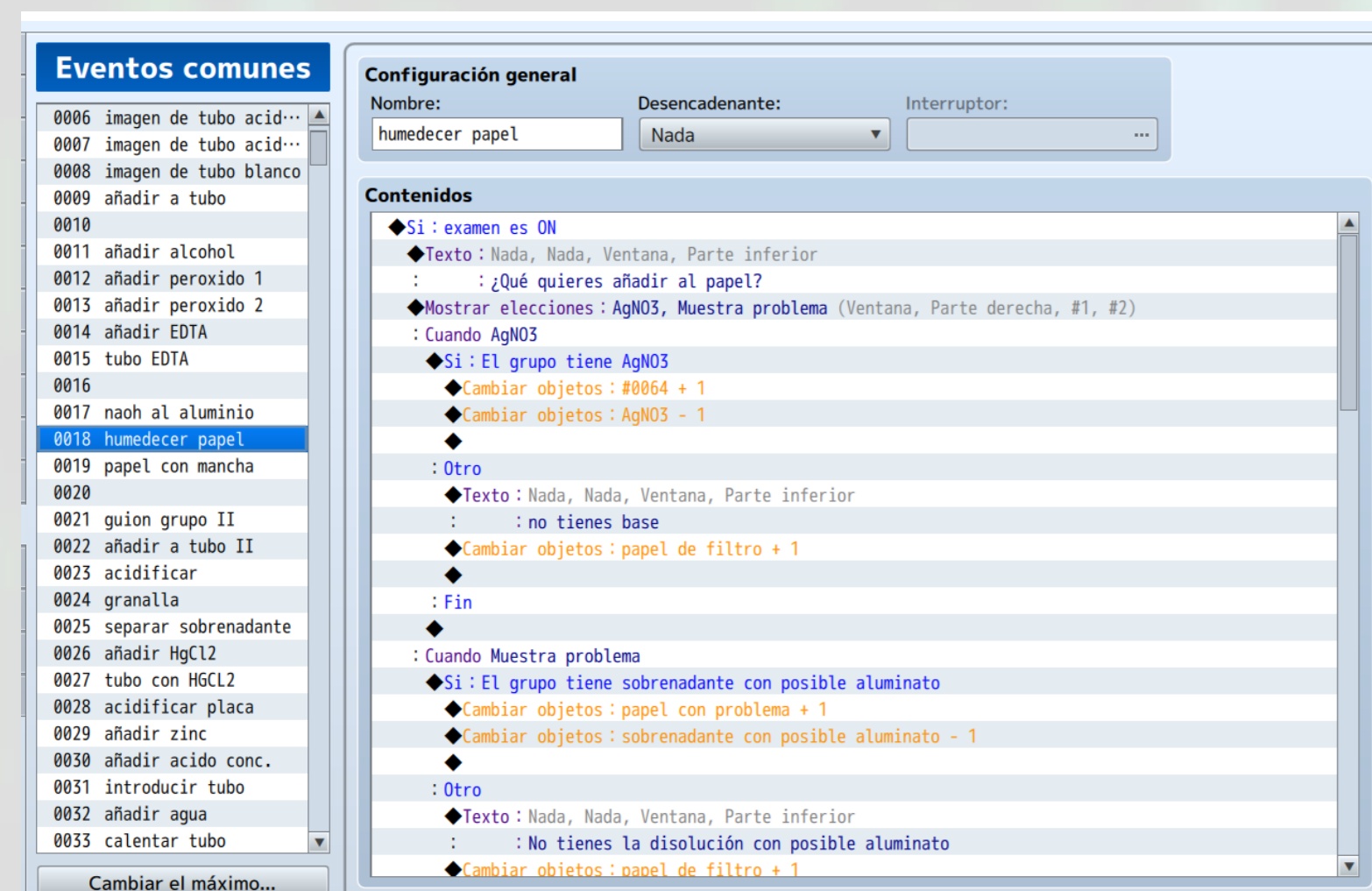
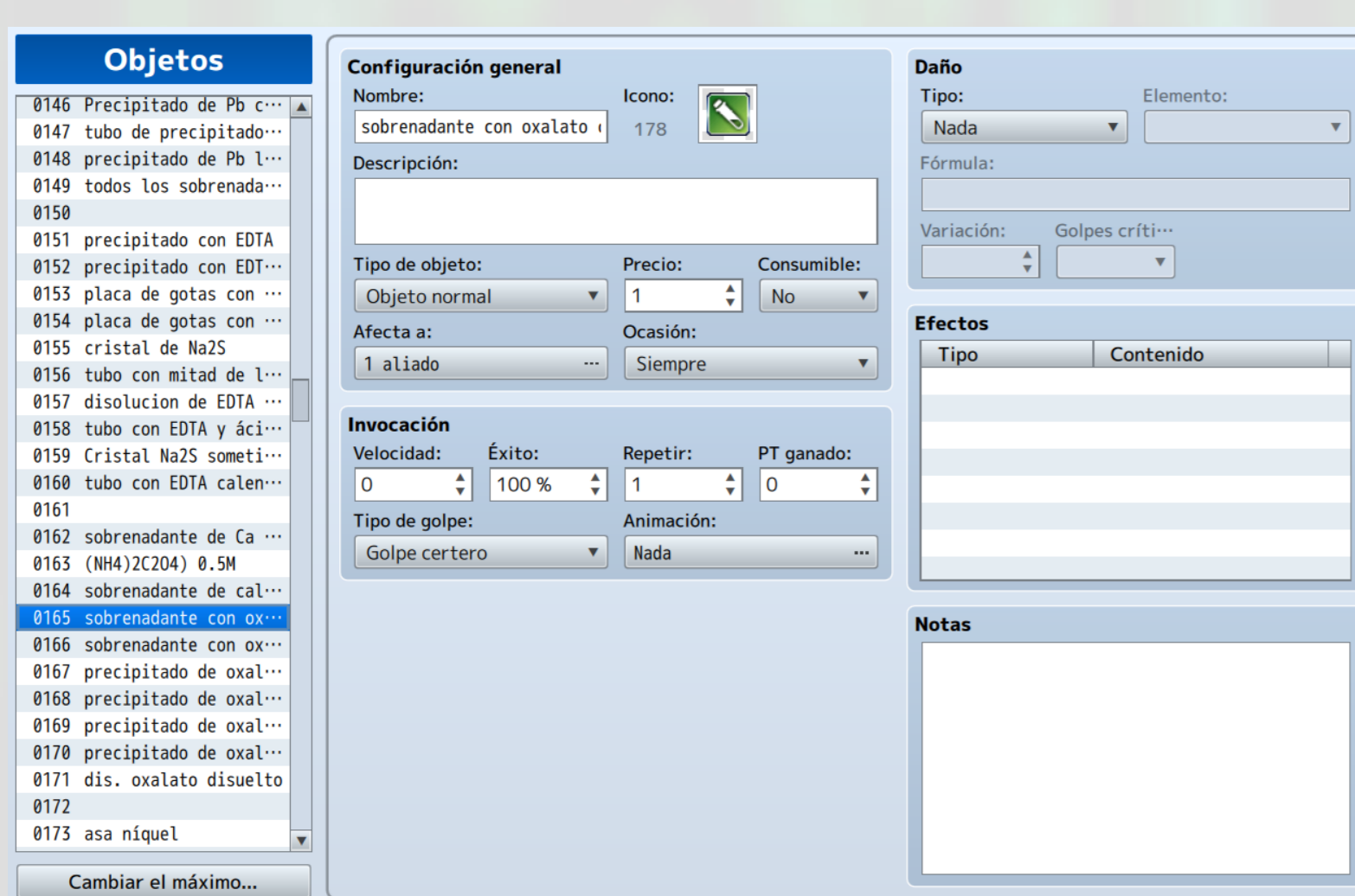


Programming

- The content has been programmed with various aspects that allow the simulation. Among them are objects and common events.
- The objects are the most important elements in the game, which the student will identify with the elements of the laboratory and with which they will have to interact. Furthermore, the objects must be programmed with a series of characteristics.
- Common events are the programming codes that will allow certain things to happen, such as the substitution of some objects for others when performing "reactions". These will happen when the events are triggered by actions or situations.
- On the other hand, the programming includes the coding of the minigames through new environments and fantastic events that make the activity something enjoyable and entertaining. These minigames are programmed from another less realistic perspective.

Teaching Content

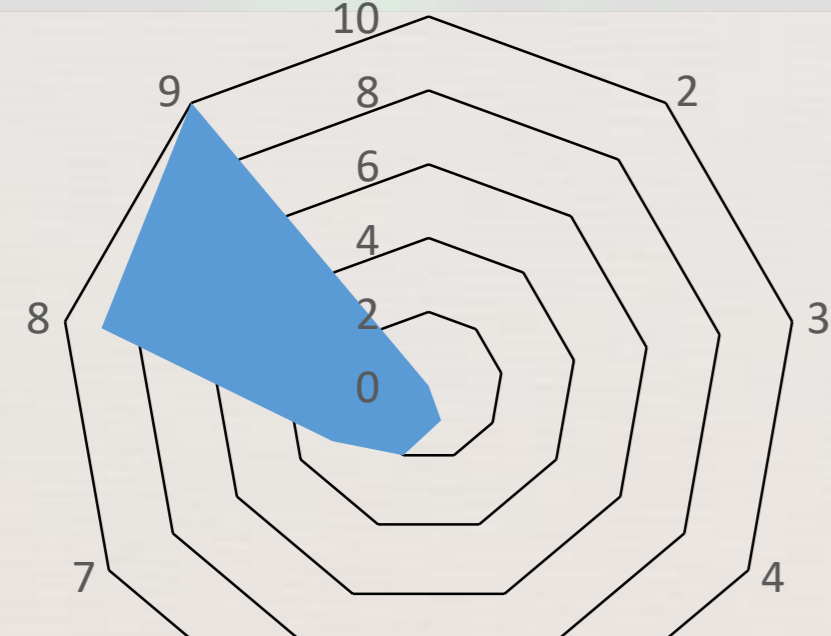
- The videogame has been designed to simulate the procedure of the analytical chemistry laboratory-I of the degree in chemistry at Universitat de València. In this subject, qualitative analysis was carried out by the identification of metal cations in a solution.
- The game develops the contents of the practice in a realistic way following the laboratory instructions.
- Two types of theoretical information can be used within the laboratory to achieve useful reinforcement content. The first is the explanation of the basis of the tests incorporating the chemical reactions that it take place. The other is the procedure to carry out the practice.
- The game uses visual content so that the student remembers the processes and the meaning of the results. For this, images of real laboratory results are used.



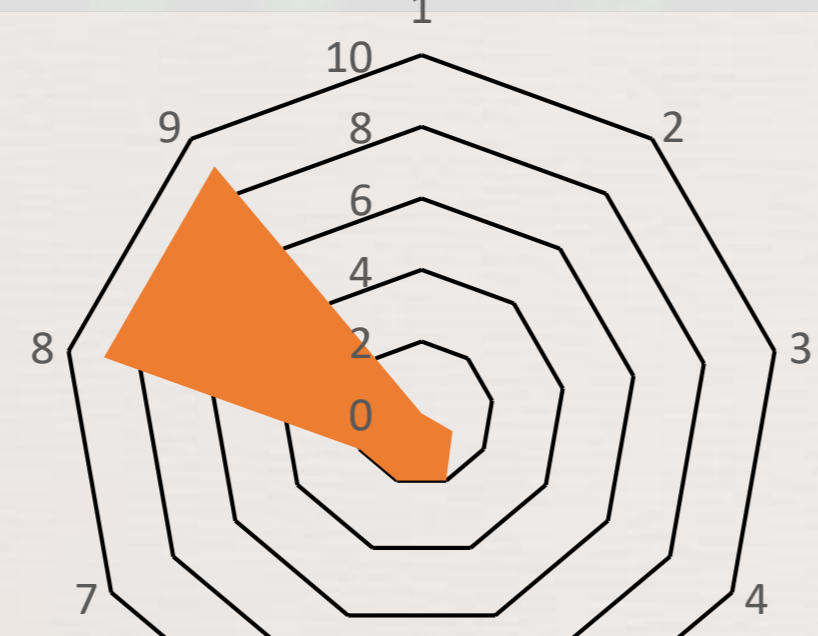
Surveys

- In order to evaluate the videogame, online surveys have been developed.
- The surveys got, on the one hand, parameters related with the person in order to establish the population profile and, on the other hand aspects related to the videogame.
- As can be seen in the radial graph all the participants evaluated very positively (above 7 on a scale of 1 to 9) parameters such as originality, teaching experience, realism or degree of satisfaction.
- The surveys had also a section that includes the opinion of the users in order to improve the videogame in the future.

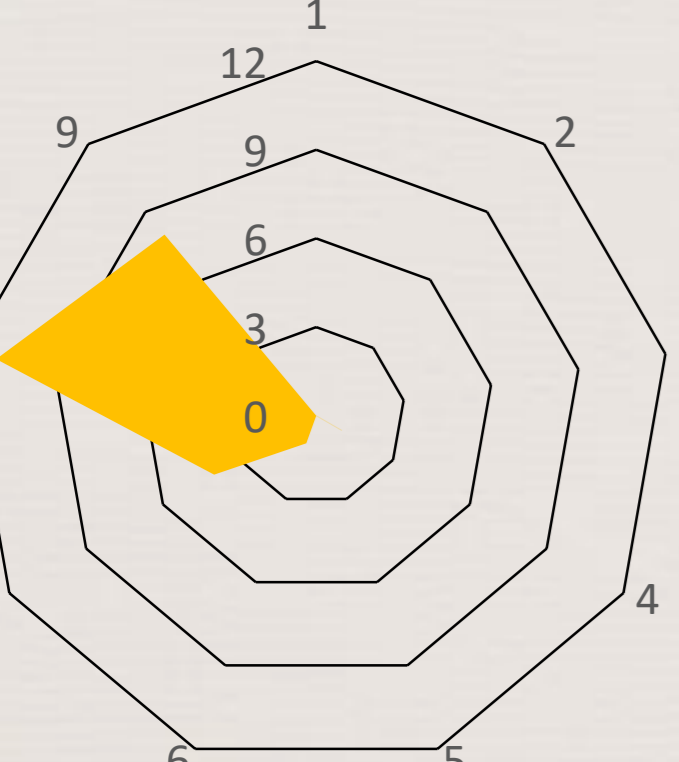
DEGREE OF SATISFACTION



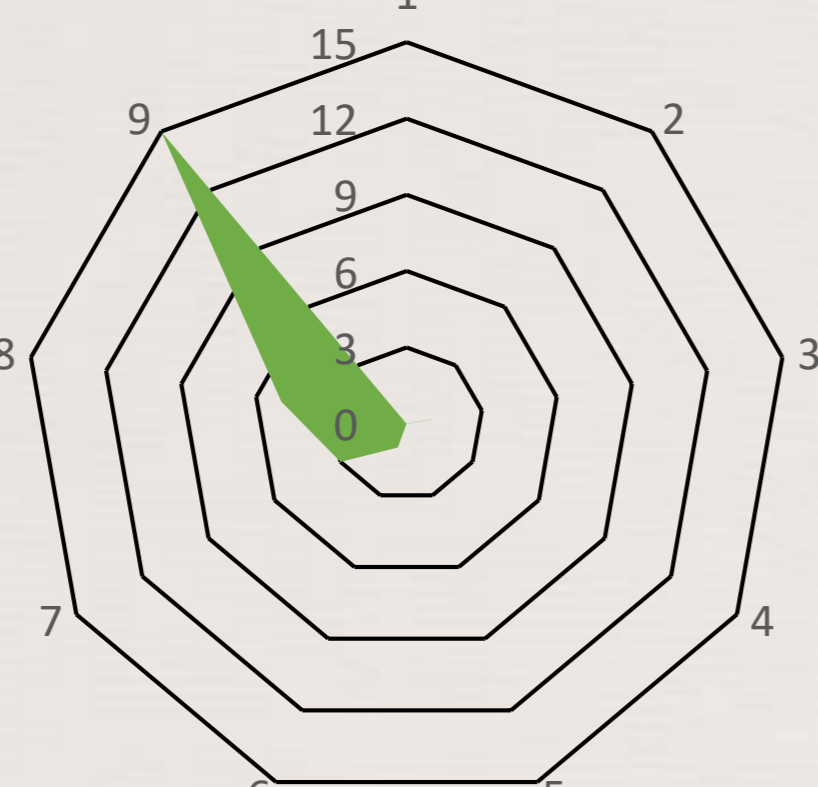
DEGREE OF REALISM



REPEAT PERSPECTIVE



TEACHING EXPERIENCE



User's Opinion

It shows the potential that the world of videogames must transmit theoretical and practical knowledge in a different way. We are facing a tool that can undoubtedly change educational practice, and more so in times where social distancing prevails due to health circumstances. A great job, without a doubt.

The game in general is very Good as a tool to replace laboratory practices in situations like the current one (Covid-19). At first it is a bit difficult to start, but with the appropriate instructions you adapt and can comfortably do the practices. With a little more Dynamic instructions to be able to read them faster and more easily, it would be luxurious.

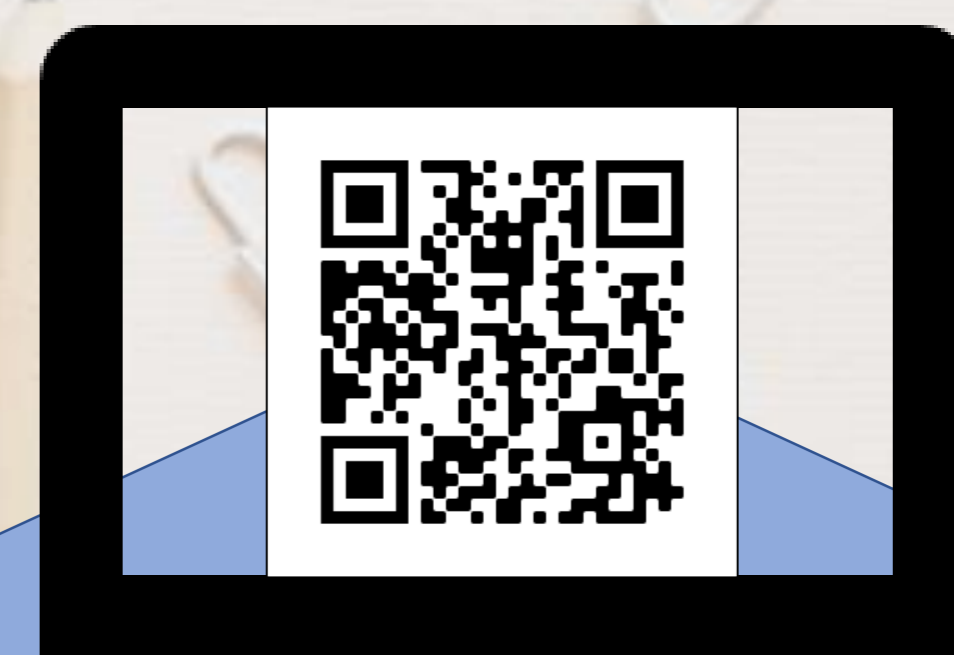
It seemed to me a very original solution to the problem that is having to do the practices. In addition to being functional, I have found it useful and easy to use (especially thanks too the incorporation of elements such as the map or being able to always have the instructions).

Even without having anything to do with my professional Branch, it has managed to keep me interested and I have learned quite a few things. I wish things like this had existed when I was studying, maybe many people would consider other options when studying a career if they formulated it that way.

Conclusions

- From the results of the surveys, it can be concluded that the videogame achieves the ability to reinforce the contents of the laboratory effectively.
- The user's opinion has shown that the game has potential and has given us new perspectives for improve it.
- It is aimed to continue the Project to polish the videogame and to incorporate new reinforcement elements.

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SOCIAL MEDIA