

# User Experience Evaluation to El Encanto: a Serious Game for Learning Community Intervention

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**Abstract.** Social work students are trained to learn social interventions in order to promote social change, problem solving in human relationships and the empowerment and liberation of people to enhance well-being. In Mexico, these actions are held throughout the country. However, because different reasons such cost, distance, or for something more worrying as security, technologies for social and mental health purposes have been emerging to support the learning process of community interventions, one of this technologies are serious games. This paper presents the design and user experience evaluation of a serious game intended to support undergrad students on the learning of community interventions on social work curricula. The usability evaluation of this serious game presented favorable results from the users: they felt the game efficient, easy and immersive, which is important for both educational and fun purposes.

**Keywords:** Serious games, social work, training, higher education, usability.

## 1 Introduction

The evolution of video games changed the way people communicate, collaborate and work. A growing number of researchers, academics and scholars [1-5] recognize the cultural impact of video games. For [6] games are more than technologies, he explains that video games are also indicative of broader technological and cultural shifts that have consequences for educational technologists.

The design of serious games in education can provide valuable assistance for generate competences without cost or danger to the students. Such, is the case for community intervention skills for students of social work and psychology, because to generate such competences, they have to travel to distant communities and learn to identify social problems. They can suffer due to the insecurity situation in Mexico [7]; in addition to how difficult it is to reach some communities by the nature of the terrain.

This paper presents the usability evaluation of a serious game to facilitate the acquisition of skills in community intervention for students of the University of Colima, this as support and technical training prior to field work in rural communities.

## **2 Background**

The term of serious games is referred to the ones that are used for training, publicity, simulation or education and they are designed to be executed in computers. Serious games allow the student to simulate and experiment with situations that are impossible or difficult in the real world for different reasons, such as security, cost or time [8]. Different to traditional video games, serious games use pedagogy to infuse instruction into the game play experience and they are by nature suited to engage the learner and encourage active construction of meaning and development of skills [9]. Zyda in [10] explains that a serious game is a mental contest which is executed on a computer and contained specific rules and uses entertainment to further government or corporate training, education, health, public policy, and strategic communication objectives.

Nowadays, serious games are receiving interest from researchers and industry because of the advantages that in education and formation present [11, 12]. Besides, according to some researches [13, 14] consider serious games motivating and attractive, as long as the characteristics that make them convincing are incorporated. In fact, they even found that these types of games are extremely engaging and when they incorporate features that have an extremely compelling, they can be even addictive.

### **2.1 Serious Games and Education**

An increasingly diverse student population, with different backgrounds and abilities, has contributed to a rethink about effective ways of teaching and learning, and video games offer many pedagogic benefits over traditional methods of teaching and learning [13]. Brown in [15] mentions that as the adoption of video games by the military as devices of training and recruiting, the appearance of video games in classrooms represents an important institutional credit to the new media. Squire in [3] states that video games encourage a way of learning that transcends traditional disciplinary boundaries and emphasizes integrated problem solving. Some authors such [16, 17] found that video games encourage skills related with teamwork, competence, collaboration, critical thinking and communication.

### **2.2 What Intervention is?**

According to The International Federation of Social Work [18], the social work profession promotes social change, problem solving in human relationships and the empowerment and liberation of people to enhance well-being. In addition, intervenes at the points where people interact with their environments.

One of the definitions of intervention is that is an influencing force or act that occurs in order to modify a given state of affairs. In the context of behavioral health, an intervention may be any outside process that has the effect of modifying an individual's behavior, cognition, or emotional state [19].

In Mexico, the first early experiences for improvement and community development were through the so-called cultural missions. These actions were held throughout the country with the desire to improve the situation in rural areas, promoting community solidarity to fight poverty, ignorance and disease.

### **3 Design of the Game**

As Grabard et al. mentioned in [20] there are two distinct domains in development of interactive systems: behavioral and constructional. In the behavioral domain, there are the tasks concerned to the user interaction with the application and the view of the user; and in tasks relatives to the software construction, the codes and systems, are under the constructional domain.

Therefore, the development process for this work is divided in two parts, all the work done under the behavioral domain, which include the techniques used to design and develop the user interface software component; and all done under the constructional domain, which involves 3D model production, Unity codes, and integration.

#### **3.1 Methodology**

It was used a variation of the user-centered methodology proposed by Gabbard et al. [20] for the design of the user interface of this game, and is based on the following:

- User task analysis.
- Summative usability evaluation.

#### **3.2 User Task Analysis**

This is the first stage in the process, in this, it is pretend to identify a complete description of tasks, subtasks and methods required to use a system in addition to have a complete understanding of the user. With this process, designers have a clear understanding of the user requirements, therefore, could design better functionality according to the user.

For this project, developers performed a user task analysis by interviewing two experts and professors in community intervention and four students involves in this activities. As result of this task analysis, developers obtained the complete information of the activities that make the professionals whom made these interventions in communities.

- Community tour: Take a tour of the virtual community, interact with characters and the environment, this tour is free and the limits are the size of the virtual scenario.
- Detect problems and characteristics: As the user makes the tour to talk to some characters, this is called unstructured interview, must pay attention to the conversation, as it may define characteristics and problems of the community, the user can also identify problems interacting with the environment.

- Identify leaders: In the route taken to the community should identify community leaders, both formal (sheriff, president) and those that the population identifies as natural or informal leaders, as priests or doctors.
- Analysis and problems categorization: Once you have identified all the problems and characteristics as well as community leaders, the user must read the document diagnostic of the community, in order to analyze and categorize the problems in order of importance.
- Support management with leaders: When the social problems of the community have been categorized, the user must manage permissions and spaces with authorities to arrange working meetings with leaders to find ways to solve community problems.
- Organize activities for resources: After completing the work meetings that led to results the activities to be performed, the user must help leaders to organize activities that allow you to obtain the financial resources needed to solve the problems of the population.
- Support to organize people: Finally, the user guides the people to make use of the financial resources obtained in favor of solving the social problems of the community.



• **Fig. 1.** El Encanto user interface.

Based in the tasks, were designed the game activities, which are divided in seven working-days in which will be activities designed to run the tasks defined above, these working-days are described below:

Work-day 1: On day introductory aid is provided to the user to use the system tools. It shows which activities to be undertaken in the area allocated for that purpose and which can access each you want.

Work-day 2: The user must go to interview the leaders, and calling them for a meeting. This call must be made through posters distributed in the community, once the meeting with leaders has done, we proceed to the ranking and mapping priority to the problems encountered.

Work-day 3: Explore the community looking for the leaders to make a second meeting to develop strategies to solve obstacle impeding the solution of the problems.

Work-day 4: Explore the community select each of the problems and assign responsibility for its solution, every mistake will cause decrease their game points.

Work-day 5: This work-day will show to the user a list of activities to be performed to generate economical resources, these recourses will be used to solve the community problems, each activity generates a different budget.

Work-day 6: Once user generates enough money, systems present the different problems, to assign each activity the appropriate percentage of the budget.

Work-day 7: This work-day will show people of the community working to fix the problems, at the end appear the problematic issues resolved and the application shows a report with errors and points earned.

Based on the tasks and work-days descriptions, we create a functional prototype of the game (see Figure 1) and a usability study was conducted to analyze how students accepted the use of the videogame and its usability.

## 4 Evaluation

To measure the usability and acceptance of our game a study was conducted by the IHCLab Research Group of the School of Telematics in the University of Colima (see Figure 2). According to Nielsen [21], the subjects of study were 7 people, 4 male y 3 female, 100% were undergraduate students who study intervention methods as part of their classes. 71% had previous experience playing video games, spending an average of 2 hours a day; they play on their houses, consoles or PC mainly. 100% had use videogames in order to learn some subject.



**Fig. 2.** Evaluation session.

### 4.1 Procedure

An evaluation session lasting an hour and a half, including the followings phases:

Phase 1: Students were given a 10 minutes introduction.

Phase 2: We performed a live demo showing the students the features of the computer game. The aim of this was to put in context the use of the controllers to the participants.

Phase 3: The participants were given a task list to complete on the game.

Phase 4: In this phase, the participants were asked to complete a game experience questionnaire (GEQ) with two dimensions. In addition, a final survey about acceptance of using a videogame as educational tool was applied.

## 5 Results and Discussion

The GEQ is divided in two dimensions: (1) four questions, where the learners had to give a grade from 1 to 10, where 10 is the most significant, and (2) seven questions that measured: efficiency, effectiveness, immersion, motivation, emotion, fluency. It had a 5 Likert scale.

### 5.1 First Dimension of the GEQ

The first dimension of the GEQ include the next questions:

- Q1: Did you find the game fun?
- Q2: Did you find the game exciting?
- Q3: Was it difficult to adapt to the game control?
- Q4: How easy it was to fulfil the objective of the game?

The students found (see Figure 3) the game fun and exciting, with a low difficult to adapt with the control and they believe the game was easy to fulfil its objective.

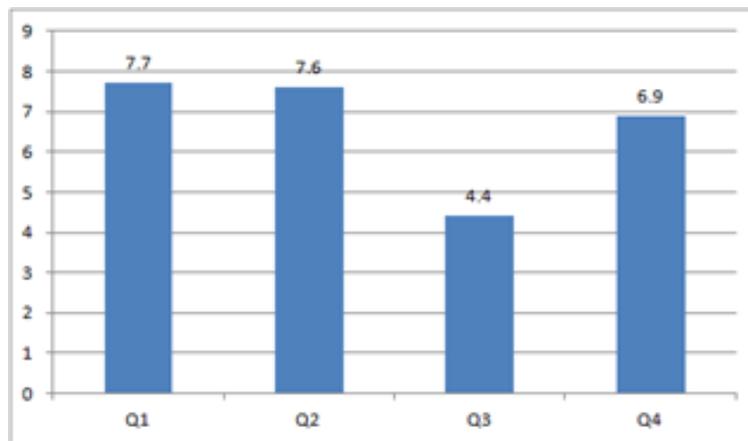


Fig. 3. Results of the GEQ first dimension.

### 5.2 Second Dimension of the GEQ

As mentioned, the second dimension measure seven indicators. The results of this dimension, considering the items with scores “Totally agree”, “Agree” and “Neutral”. The 100% of participants perceived the game as efficient and with good learning curve; 86% thinks the game is immersive and fluent, 71% of the user perceive good motivation for use it; and finally we found the weakness on effectiveness with the game difficulty with a 14%.

Based on these results, we found that users perceived the game efficient, fluent, immersive and easy to learn, also they have a good perception of motivation and emotion, but we got a lack of effectiveness on the game difficulty.

### **5.3 Final Survey**

As final step, we applied a survey with two questions.

Q1. How do you feel using the game?

Q2. Do you feel motivated to use a game for learning interventions?

When we asked the Q1, the 71% of the students felt comfortable, while the rest 29% said that they felt nervous or stressed at the beginning because they do not play video games.

Finally, with regard to the Q2, we found that 100% of the students are motivated to use the game for educational purposes.

### **5.4 Discussion**

The evaluation results showed good reviews from the users, they felt the game efficient, easy and immersive, which is important for both educational and fun purposes, even though they had some gameplay problems and some of them felt nervous or stressed of using videogames a technology unknown by them.

The Game “El Encanto” tries to help in the learning of the basic skills in community intervention, but in this work, we only evaluate the usability and the game experience therefore is important to assess whether the use of the game means significant help for learning basic skills of intervention.

## **6. Conclusions**

There is no doubt about the importance that serious games have had during the last years. Nowadays, serious games are been used in different fields as education, health, and training, among others, not only because it is proved that they worth it, but also because every day there is more people playing with this kind of technology.

We developed a serious game that let students to get community interventions skills for social work students. This serious game allows students to learn without putting themselves in risk because they can simulate with situations that can be dangerous in real life for reasons that we mentioned before, overall in a country like Mexico, where nowadays there are a several cities, towns and communities with security problems.

The evaluation of this serious game presented favorable results, taking into account that the purposes were according not only to the students’ needs but also to the academic curricula.

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