

A role-playing game for dealing with Portugal economics

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Abstract: In the past few years, serious games have been used in the context of creating awareness and knowledge. Their utility has proven worthy in several areas, such as military, medicine, and more recently, management and economics. One example of these experiments is the game Troika, developed for approval of a master thesis. The goal of the game was to take decisions in Portugal's economy in order to make the country go in a healthy financial life. This game was created to create awareness in the Portuguese population, by giving them more knowledge. The game was proved successful after tested with the population.

Keywords: serious games, learning, awareness, Portugal, economics, policies, budget.

1 Introduction

1.1 Motivation

Serious games are used in several areas and for many leaning and awareness purposes. A serious game it is game, like any other, which has a keen objective, to teach the user, to create a set of tools that the user makes use of for learning. Serious game's use as a learning methodology, as a tool to increase awareness on a subject is increasing and the areas of use are becoming more and more.

An example of this kind of games is "Troika". This was a game developed to create awareness in Portuguese population. The motivation for that project is that Portugal faces an economic crisis and had to request for aid from international entities. Under their help, the Portuguese government has taken some policies that do not fit well among the people. Some consider them unfair and many simply do not believe that they will succeed. On the other hand, the population proposes "simple" policies that they think that will help the country to get back on their feet.

These issues are very damaging to the Portuguese society, but how could awareness be created on people, motivate them to fulfill their part, to be more active, so that the country leaves the downward spiral it is in? For that, they need to know that the austerity measures are fair, that they transmit equality and that they will succeed. This can only work if, first, the population understands the policies, and second, they are motivated towards fulfilling them, part due to the comprehension. It is in this context that serious games lend an enormous help.

1.2 Objectives

The aim of this work is to approach the theme serious games, by explaining what they are, where did they emerge and cite some examples. The main example that the work focus on is a game for dealing with Portugal's economy. It will be explained how the game was conceived and the main decisions drivers. Finally, there will be presented the results of the studies made with the game and the conclusions related to it.

2 Related work

In this section it will be presented a brief context of what are serious games, where did they came from and mention some examples of games used in several areas in the subject of creating awareness and knowledge.

2.1 Serious games

We believe that the oxymoron “serious games” has its roots around the 16th century, where Neo-Platonists used the term “*serio ludere*” to refer to the use of humor in literature when dealing with serious matters. Through the beginning of the 20th century, the oxymoron gained more relevance, but was only in 1970, through Clark Abt, that the term’s meaning got close to its current. In his book *Serious Games*, Abt approached the theme of games in an interesting way:

“Reduced to its formal essence, a game is an activity among two or more independent decision-makers seeking to achieve their objectives in some limiting context. A more conventional definition would say that a game is a context with rules among adversaries trying to win objectives.”

From these words, we can apprehend that games, even at its simple form, are complex and have goals and objectives. Almost all games that exist involve a strategy and have objectives and goals. Since the great majority of games have that acknowledgment component, then why the necessity to refer to that oxymoron? What are the differences between serious games and the “non-serious games”? As a good answer to this question, Abt asserted the following:

“Games may be played seriously or casually. We are concerned with serious games in the sense that these games have an explicit and carefully thought-out educational purpose and are not intended to be played primarily for amusement. This does not mean that serious games are not, or should not be, entertaining.”

Therefore, if we could balance the entertainment and the acknowledgement we would have something like two thirds of wisdom and one third of fun for serious games and the reverse for the “other games”.

Michael Zyda, in 2005, also contributed to this explanation by defining the different terminologies at stake. He define game as being “*a physical or mental contest, played according to specific rules, with the goal of amusing or rewarding the participant*”, differing

from “*a mental contest, played with a computer in accordance with specific rules that uses entertainment to further government or corporate training, education, health, public policy, and strategic communication objectives*”, his definition for serious games. For him, as for Clark Abt, a serious game is a game, like any other, that does not have entertainment, enjoyment or fun as their primary purpose.

One of the first games that got the tag of serious was in the area of politics. In 1973, Donald R. Jansiewicz, in his book “The New Alexandria Simulation: A Serious Game of State and Local Politics” explains how to play a game that was conceived to teach the principal mechanisms of U.S. politics. This non-digital game is still in use in classroom and proved useful to convey the complexity of politics. In 2009, Melvin Kahn and Kathleen Perez proved in their work that the use of this game improved the learning outcome for students in a course named “Introductions to American Politics”.

Later on with the appearance of computers, video games invaded the serious games area and one that stood out in this invasion, by its notoriety, was *America's Army*¹. Jinny Gudmundsen from *USAToday*², citing Ben Sawyer (co-founder of *Digitalmill*³), stated that “[*America's Army*] “was the first successful and well-executed serious game that gained total public awareness” says Sawyer. More than 5 million people have become registered users. By exploring the video game, you experience what it is like to be in the Army”. We can see that this game was a mark in serious video games and created a precedent on which a serious game can have a great acceptance at the same time as it raises awareness in its field.

As described above, serious games are not a recent thing, the oxymoron concept has centuries and do not have to be in digital format. They have come a long way and cemented their position in what concerns the transmission of knowledge, the creation of knowledge and the job of teaching. In the next section, I will present some examples of serious games used these applications.

2.2 Serious games and learning

Now that we know, what serious games are and where the concept came from, the question that poses is why use them. Well, the truth is that these games are very useful and have several advantages that answer to that question. In the next paragraphs, I will describe some of the advantages and complement it with some successful examples that support the claim that games, more particularly serious games, contribute in a positive way in learning scenarios.

In 2006, David Michael and Sande Chen stated, “[...] what we do know is that games, simulated environments and systems, etc., allow learners to experience situations that are impossible in the real world for reasons of safety, cost, time, etc.”. This clearly enumerates some of the many advantages of using games in learning environments.

The use of games as a simulation in learning environments provides a tool that is safe, i.e., the actions that take place in the game stay in the game, as for example, if the army trained strategies with real weapons it is obvious that causalities could occur. Through a realistic and immersive game, the soldiers would apprehend these tactics as well as in the reality and without the downsides.

Another issue stated in Michael and Chen’s sentence is that the cost and time are an additional factor for choosing serious games. This happens because the development and

¹ <http://www.americasarmy.com/>

² <http://www.usatoday.com/>

³ <http://www.dmill.com/>

execution of a game has fairly reduced costs and takes much less time than when comparing with live simulations.

Many people argue that the use of games brings problems to the player like making the eyesight worse, attention problems and greater distractibility. Daphne Bavelier⁴ is a cognitive researcher who studies how games influence learning. In her work, she stated, “*action video games have a number of ingredients that are really powerful for brain plasticity, learning, attention, vision*”.

For example, to the problems presented above, she proved that players improved their vision, allowing them to see with more detail and more shades of grey. She also verified that regular players resolve visual conflicts much faster and have greater traceability (to track moving objects, crucial in some areas like driving) than other people. Nevertheless, this use of games must be conscientious, controlled and in the right doses. For asserting this, she used a metaphor: “*the effect of video games on the brain [is] very similar to the effect of wine on the health*”.

She pronounced this in a recently TEDTalk⁵, where she also specified that a reasonable playtime would be about 10h per week. The research she did and still does contributes a lot for the statement that games, and particularly serious games, are not a bad thing (as many people argue) and has many benefits, if consumed in the right dosages.

All of this information consolidates the statute of games in learning environments. The solution proposed in this project does not bring anything innovative in terms of technology or methodology. What it brings new is the use of a game in this area and in Portugal. Therefore, there are several examples throughout the world of games used as learning help tools.

2.3 Serious games in economics/politics

As stated above, the military was one of the first groups to use games for preparing and test tactical move, early in the two world wars. In this area, there are mainly two kinds of games. One is ground training, as is the case of *America's Army*, allowing the players to practice tactics and to be more “wired” within the teams. The other is flight simulators, more used in World War II, which had such a success that nowadays *NASA*⁶ uses Apollo simulators for astronauts’ training, and some flight companies value the applicants that have several hours of flight in games like *Microsoft Flight*⁷.

Nevertheless, the military is not the only one, more and more medicine is recurring to serious games for a number of activities. These activities may have several goals, as in training or in evaluating, and some universities even use it in their curriculum, like the *University of Birmingham*⁸. Examples of these games run from verbal training where the player has a discussion with a game for improving the doctor-patient relation, to standardized patients where the students have an intensive training whether it is a physical training (with a plastic body) or mental training (having to diagnose based on symptoms).

There is still another area, also motivated from the military, which is recurring increasingly to serious games, that is the management sector. *Beer Game*⁹ is a game developed in

⁴ <http://cms.unige.ch/fapse/people/bavelier/research/plasticity-video-games/>

⁵ <http://www.ted.com/talks>

⁶ <http://www.nasa.gov/>

⁷ <https://microsoftflight.com/en-us/home/>

⁸ <http://www.birmingham.ac.uk/index.aspx>

⁹ <http://supplychain.mit.edu/games/beer-game>

*Massachusetts Institute of Technology's Sloan School of Management*¹⁰, where the player had to manage a retail distribution. The first version of this game was not even computer based, back in 1960s; only on 1990, there was the first computer version.

On the subject of politics and economy, a simulation game tries to model a set of government situations in which the player is a prime minister and has to take policy measures and examine the consequences – *Democracy*¹¹. The goal of the game is that the population reelects the player at the end of every political cycle by gaining votes among the different segments of the population without having a problem with over-debt. For this, the player has to choose a set of policies, depending on its political power within the country, and adjust them in an order so that, it avoids spending too much money or penalizing some segments of society like parents, teachers, conservatives, socialists, etc. Throughout the game, the player bases its decisions and policies on the feedback from the population. Constant graphical and statistical information provides the player sufficient information to take the right decisions and to lead its nation into a prosper future.

Another game important to mention is one recently launched in Portugal named “*Vem aí a Troika*”¹². In this non-digital board game, the goal is to be a corrupt interest group and gain power, votes and money through political, social and economic manipulation. This game tries to create awareness in a way not similar to the majority of serious games. It requires from the player a bad conduct in order to win the game and, through that way, it tries to point out to the players the bad things that occur in Portuguese reality.

Recently, for the occasion of the presidential elections of 2012 in the USA, *MarketPlace.org* created an awareness game named *BudgetHero*¹³ with the scene of having to choose the measures to fit in the federal budget. This game had the objective of showing the citizens and electors the differences between the budget plans of the two biggest candidates on the run, Barack Obama and Mitt Romney.

Also in this context, in Portugal, the newspaper *Expresso* launched on its site an application called “*Faça o seu Orçamento de Estado para 2013*”¹⁴ in which users could choose different levels of investments and cuts in order to reduce by 4,5 billion euros the annual budget as desired by the Portuguese government. This tool has the objective of challenging the population to arrange alternatives to the decision of cuts made by the government.

These several examples of different kind of games, from various sources and with several goals, translate the importance of serious games and are a great proof for asserting that they are a powerful tool to spread the message, the knowledge, never forgetting that being a game it is supposed to be enjoyable.

3 Troika

In this section, the goal is to report, from a high level, the concept and characteristics of the game. Therefore it will be approached the phases of development of the project, the several methodologies used in the project and the final game result.

¹⁰ <http://mitsloan.mit.edu/>

¹¹ <http://www.positech.co.uk/democracy2/index.html>

¹² <http://www.tabletipgames.com/vem-ai-a-troika.html>

¹³ <http://www.publicinsightnetwork.org/budgethero/>

¹⁴ <http://expresso.sapo.pt/faca-o-seu-orcamento-do-estado-para-2013=f765753>

3.1 Concept

The game consisted in a role-play game, i.e., the player must take a job and execute it at its best capabilities. As stated in before, the goal is to create awareness of the political and economic reality of Portugal, in people. Taking this the main role that a player can assume is the job of prime minister. With this, the player has to take decisions/policies, to adjust the budget in order to maintain the economic health in the country.

For this to work there were goals within the game. These goals were mainly economical, like reducing deficit, but the main goal to win the next elections. This goal is crucial for the player to understand if the job he is doing is good, and accepted/approved, within Portuguese society.

This feedback is one of the most important of the game. A real and accurate response from the game, to the decisions of the player, is what created awareness in him. So, what is this feedback? One key aspect are the poles, as I mentioned above the main goal of the player is to be reelected for more political cycles, and the way for the player to know how its actions take effect on the number of votes he will receive is using always up to date poles.

3.2 Development

The development of the project consisted in several phases, aligned with a waterfall project management methodology.

The first step was to analyze and choose the principals that guide the game, also known as requirements. These requirements were based on the analysis of the market and on the debriefing with a group of key users. During these analyses, another process was on course. For the game to work it was very important to have a model of the economic reality in Portugal as well as a good reasoning about the social and political factors of our society. In order to do this task there was collaboration with professors from *ISEG*¹⁵ (Instituto Superior de Economia e Gestão).

The next phase consisted in developing the game. During this phase, there were tests with key user groups where the goal is to assure that the game fulfills the requirements. This was important because the product will be a game and if it does not work according with the requirements or with what the users want, then the project was a failure.

In a final stage, for assuring the goal of the project, that is to create awareness, it was needed more tests with users. These tests are different from the previous because the objective was not to check if the game was ok in terms of interface, gameplay, etc., but instead to determine if the players learned something, if they gained knowledge.

For reaching a greater number of people, the game was developed to be available online and using the most up to date frameworks. During the development, there were several design and implementation decisions that follow the state of the art as well as the best practices of the marked.

3.3 Final result

Next it will be presented some screenshots of the game available online. Along with the screens, there will have a brief explanation of the basic functionalities of the game.

¹⁵ <https://aquila.iseg.utl.pt/aquila/instituicao/ISEG>



Figure 1 – Main screen

The screen above represents the main screen of the game where we can see all the functionalities of the game, accessible from the several buttons along the edges of the screen. From them the player can access other screen where he can see the objectives, change things, see the feedback or get help. One of these screens is the bellow, the Budget screen where the player can change the variables in play in the game.



Figure 2 – Budget screen

Another important screen, a feedback screen, is the following, where the player can see the satisfaction of the population in several areas, so that he knows how close he is to be re-elected.



Figure 3 – Polls screen

These screens are only a small representation of the complexity and immersiveness of the game. For more detail, follow and play the game at the site¹⁶.

4 Results

After the development of the game, and to ensure its purpose, tests were made with a variety of users. The test population was 67% male, with the majority of ages between 19 and 29 years old. In what concerns literacy, 76% of them had a college degree, 11% with a Master's Degree and the rest with a Bachelor's. When asked how they classified their knowledge in Economy/Finances, half of them considered as having basic knowledge, as 38% considered as experts and only 11% refer that had less knowledge.

For asserting the gain of knowledge two equal questionnaires about economics/finances were made to the players, one before playing the game and one after. The results were compiled and are compared bellow.

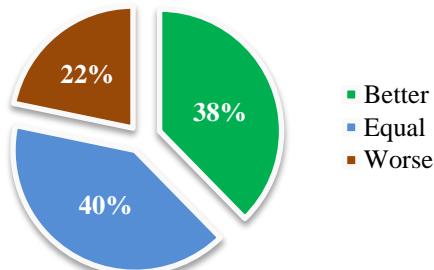


Figure 4 – Summary of results

The figure above shows that 78% of the players maintained or improved their results in the test. Although some decreased their results, all the study groups had an improvement. Since the age group of 13 to 18 years was composed by a small sample, the results diverge from the expected, like the other parameters. An interesting conclusion is that the players with less knowledge were the ones that improved more.

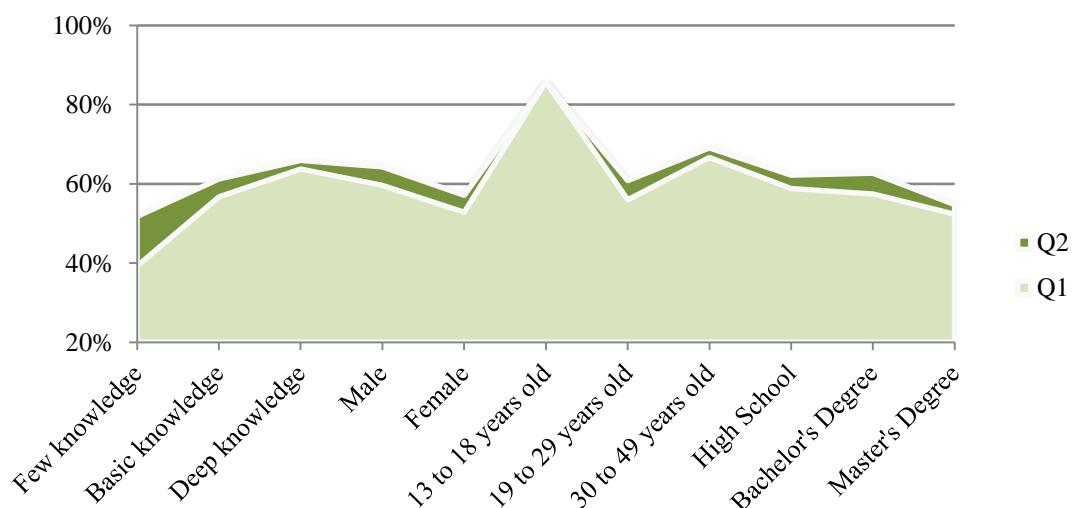


Figure 5 – Results by study group

¹⁶ <http://web.ist.utl.pt/ist166905/troika/game.html>

5 Conclusion

Considering the results shown above, it was asserted that the game contributed for creating knowledge in the Portuguese population. Although the gains weren't much significant, they are still positive and improved results.

As many other games like the one studied in this work, their use can contribute for creating knowledge and raising awareness. Due to the success and the advantage of using these games, more examples like “Troika” will succeed.

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