Digital game based learning with free online games: analysing two games against poverty

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Abstract:

This article explains some possibilities of using digital games in education, in both presentational and distance learning, approaching the learning process through simulation games and the importance in caring about students motivation. This article analyses two free educational online games with poverty and hunger contents, explaining why educational contents should be integrated with the game mechanic to a good learning process.

Key words: game based learning, simulation game, distance learning, free online game, educational games

1 Introduction

Humans have changed in the last decades, and one of the main influences consists on the interactive technologies that transformed how the population’s minds work, communicate, have fun and learn [1]. At first, the technology affects a small amount of people belonging to academic and research institutions, but nowadays that a whole generation grown up with technology, there is a great demand for services adapted to technology changes. Digital games are so popular because people enjoy playing on them due to demand an active behaviour, to present challenge activities and to involve problem solving. New educational tendencies have some similar characteristics, but how to integrate it all with new media and think the teacher’s role in this process? These answers are something that takes some time.

Distance learning is a growing tendency in this generation and economy. It is a new challenge, based on technologies and internet. However the number of possibilities implies in questioning what technology is better to create an online course? How to explore the technology to enable, the better as possible, all the educational potential?

This article discusses the use of online games as an alternative for education; showing that some good free games are available in the internet that makes possible the use of expensive interactive and valuable technology. This practice evidences the importance of sharing educational material in the web to make the education easier, enjoyable and more complete. Before the game analysis, the process of game based learning and the role of digital games in education are discussed.
2 Game based learning

Games are usually a learning activity. The varied nature of digital games forces the player to be usually in an insecure state: each time a game can surprises the player, who must learn something new to continue. When the player is challenged, he is supposed to find out how to win the game with the elements the game gave to him. He must learn and discovery to keep playing. [2]

To reach his objectives, the player must master some ability. Most people believes that master a digital game means to press the button faster with dexterity, and in some situations it is true. But what the people rarely observe is: to improve a gamer ability is often related with his understanding of how the mechanic of the game works. To reach his objectives, a player must learn the game itself. [3]

Some challenges are connected so the player can use an ability he already learned in a different situation; and learning something new while he transfers his knowledge to a more complex one: in this process of learning, get used with it, and adaptation, he learns by playing [2].

Digital games usually have a learning structure, so the player can learn by himself, probably without check out manuals or help options. The challenges often begin in an easy level – in a good game, it gets harder as the player improves his abilities and get used with them. It is what keeps players engaged, the better they get, most difficult will be the challenges. To be in constant evolution makes players motivated.

2.1 Motivation

Motivation is a big reason why to use games on education. Lots of games are difficult and complex, although small children can usually reach the end successfully. We can easily say why by just watching them playing: if they are focused and applying theirselves in the game, they can be always improving. They may have great results if they just apply their time and energy on it. It is just a matter of making them enjoying to do it.

The new possibilities opens a course to the student – as a new and better job, new activities or an improvement of other nature in his life – all of this can be the motivation of a student to go to the computer and spend hours reading and doing exercises after a hardworking day. However most of the times it is not enough, in distance learning courses is quite high the rate of students that give up before it ends [4].

If the student enjoys the activities, he can choose to do it instead of doing any other thing. The most engaging the course can be, the better chances it will have to compete with other activities the student may do in his computer: exciting games, web surfing, and everyday tasks.

Motivation problems can be seen also in schools, where different problems from distance learning may be find out. In standard schools, the kids suffer from the contrast between the new medias – like videogames and internet – where they have autonomy, dynamism, and school, where all students must advance in the same rhythm and content, in which he is usually not interested. It’s not surprising that many students just hate school [1]. Technology changed faster than school, and the students feel it in their everyday life. Making school and games closer, with fun and learning, may be a way to create desire and pleasure in learning [5].

To complete the activities and finish the course aren’t the only purpose of creating an engaging course or class. The immersion – so called flow state – of games happens when the challenge and player’s abilities are in the same level. If the challenge is too easy, the game gets boring; if it is too difficult, the player gets frustrated. The tasks should be difficult exactly enough to be completed successfully [6]. This flow state is a learning state too, because it is
when the mind is fully confident and applied with good results, and the player must reach his limit to achieve whatever problem he is solving. All his attention has a single focus, and his mind is working hard [7].

Some studies show us that adding fun to the learning process is effective to the learning results [4]. If the activity is enjoyable and fun, the student will be relaxed in a good way, when they can take things in more easily. It makes sense when we realize how much information people can remember from their hobbies and enjoyable activities.

### 2.2 Situated learning

Games can keep players motivated and paying attention, but why it is useful? While playing digital games, students will have to deal with some content. Every digital game has some to be learned, the objective of the educational game is to create guided content to support traditional education. But the great difference from mostly approaches of games to the content is that it is not direct to the point, but it comes in a big pack of context, story, and identity [8].

It is easier to remember a complete experience than an isolated bit of information. In a good game, the player does not have just an information, but lots of answered questions: who? Why? For what? He may has characters, objectives, explanations that completes the main content, creating a pack of reasonable information. The cognitive engaging of the player and the combination of sensorial elements will make not only the experience remindable, but every little bit of information will make sense to him.

This relationship between gameplay and educational content can be found in some games, but not all of them. Some games work inside a game structure, but independent of it. It’s is the case of some games that uses a traditional game, and add some content-based questions inside, that could easily be generated randomly. Like an action game that suddenly pops up a window with some question about fish reproduction. This kind of game makes the player mind jumping from one kind of challenge to the other, from the game to the content, and they are not integrated, just together. We cannot say there is a situated learning in this situation, because all the context has no influence in the question.

Simulation games in the other hand have this name because the game tries to “simulate” some real system. It tries to incorporate the content logic and reasoning in the gameplay, so the understanding of the content requires to make the game working well. It will unite characters, places, motivations, devices, stories, objects, objectives and problems in just one experience, and all elements are related to the other in a reasonable way. It’s why simulation games – like the Sim series – SimCity, The Sims, SimFarm, SimHealth – are so much used in education [9].

### 3 Games and education

Since the end of seventy’s decade there are people trying to put together digital games and education [1]. Students could spend so much energy on games, that adults tried to make them spend their time in an activity they belief were useful. More than that, educators began to notice that games are a good learning environment, and may teach educators how to keep students engaged and to improve their understanding of the content. Some digital game elements could be used in the classroom, even without the equipment itself, like information on demand and challenge structure [2][10]. Even in distance learning, digital games open new possibilities of interaction with computers, making the student experience more complex, fun and worthy.

### 3.1 Games on distance learning

Distance learning experience is being improved with technology advances. Nowadays with faster web access it is possible to implement online courses based mainly on web experience.
This media may have a different language, using not only texts and images, but animations, video, and new interactivity possibilities. The computer created new possibilities of interaction using the mouse and keyboard, accepting the user not anymore as a passive learner, but an active individual which learning depends on his interested behaviour, clicking and navigating by the sea of information with a controlled freedom.

The variety of interaction can improve the user experience, but also improve their motivation on studying. Distance learning today can be the possibility of free time education of an employee, which means the learning material won’t find a very motivated student, but a tired one. To engage them in e-learning we should use the new technology possibilities, integrating the different languages to make them awaked and interested [11].

Games could be used making the student interact with the content inside the game, with situated learning and content-based challenges, to improve the experience and motivation. Considering the high costs of developing a new game, there are some alternatives:

a) adaptation of an existing game: it has the advantage of being known his potential to motivate players, the game was already tested and designed for professionals to the entertainment industry. The disadvantage is the gameplay may be no relationship with the content, and adding content is a difficult task: it can make the game boring [9];

b) using existing games as they are: the biggest problem is the little amount and variety of good educational games available. This alternative will be better explained in the next session of this paper.

Even the creation or adaptation of an educational game needs education and design professionals, both of them understanding that the game must be educative and fun simultaneously [7].

The presentation of the game in the course must be done with responsibility. Even when using a free web based educational game, a distance learning course must prepare and support the game practice. Quinn [7] advises using the following structure:

a) introduction: it should be clear the objectives of the game activity and that it is a learning experience;

b) concept: the content that will be worked in the game must be explained so the content will be clear in student’s mind;

c) examples: with examples the student will understand the relationship between theory and practice;

d) practice: the game is the moment to see the concept working and to have a deep comprehension of the content;

e) summary: after the game, the course should make evident what he just learned and complement the information the student find in the game.

This structure could be used as an activity in school too. But in this context, the teacher can find alternative approaches, because he will be present in the game moment, what open the possibility of more control and understanding of the student’s reaction to the game.

### 3.2 Games at school

One of the missing abilities of digital gaming practice is the reflexive thinking. In a dynamic context where the user may try dozens of times in few moments and almost without any loss, there is no place for reflexive thinking [1]. It is why digital games and school sounds so good: the teacher can bring questions to reflection and group discussion, creating the links between the game and the reality.

Digital games are not an object separated from culture. It is a strong tendency, and it is related with a new relationship with technology. When playing games, students are getting used with the try and error discovery strategy, they are being prepared for their later life [2].
Even commercial games could be used in school as an educational tool as a cheaper option if compared with developing a whole new game; and a fun experience if compared with some boring educational games. Although many teachers find some resistance from parents or educators: we still don’t have much research in this area [10][12] and our culture still believes fun and education should not walk together [4].

At school, there is little or no opportunity to purchase electronic games, and free games are a good option to work with children.

4 Free online educational games

Although there are good points on web based learning, the process of game development is very expensive and requires an extra time. One alternative is to use some already made games. It will have some disadvantages if compared with a game created specially to the course, in online education:

a) there is little variety of free online educational games available in internet. It is easier to find games with educational content, but it will be difficult to find good simulation games with situated learning;

b) the educator won’t have the control of what is happening exactly, whose students did the activity, and if there is any problem with bugs or other technical problem, the educator won’t have access to repair it;

c) the assessment will be difficult, so the game could be used as a free activity, and not as the main exercise, but a suggestion;

d) the online game can just change their URL or have the website closed, and the student access wouldn’t be possible.

In the classroom there are other kind of problems: all the students should have access to a connected computer, the school computers should be available so all the students would be able to play. If it is a class activity, how to ensure all the students are playing and not surfing in the web? How would be the preparation of the students? What would be asked to watch or note? The questions are very specific to each situation and the teacher surely would need some time to plan every detail.

There are some websites that present some educational game lists, as Mission to Learn [13], The Education Arcade [14] and Nobel prize [15]. In this paper we will discuss how students may learn from two poor family simulation games: Ayiti: The Cost of Life [16], and 3rd World Farmer [17].

4.1 Ayiti: The Cost of Life

In this simulation game the player must choose which action each family member will take: the options are work in the family farm and make a little money, work in the town, with better income but instable opportunities, pay for some education in the school or pay for some health treatment in the hospital.

The game begins with five family members, father, mother, two sons and a daughter, all of them with no education or objects in the house. To get some education open better possibilities of working, but costs some money and needs some energy and time. The challenge is to make money enough to pay their cost of life in every season while keep them healthy and happy, a really difficult task. The jobs usually have low payment or need too much work, and it’s difficult to have extra money to spend on education. After four years the game ends, and probably some family members will be dead from sickness (as malaria, diarrhea, and cholera), the survivors will be sad, unhealthy and probably still with low education. Of course a happy end is possible, but is not easy to reach.
This game has the objective to be as realistic as possible, making evident the difficulties of a poor family. Lots of details make the experience rich, and the player can realize how difficult when the family have no education: the payments are low and everything looks expensive, even a bicycle to get a far away job or school uniform to study in some specific place, and all this makes the life harder. The player realizes that poverty makes it difficult to keep children in school, good food and health and a decent job, as we desire every family has.

The game offer the option to work as voluntary to help the whole community, and that is a way to help the village with improvements as a library and a soccer field. It reveals the importance of an united community working together, and the value of voluntary work and the support of organizations.

4.2 3rd World Farmer

This game is based on the management of a poor farm in Africa. The choices in this game are focused on which investment would the player spend his money in each year. Must options are about what kind of plant to seed, animals to buy or improvements to the farm, but there are some options about the family members: to go to school, to take remedies or to have babies. In each year you must ensure you will have money next year to buy more grains and afford any surprising problem.

In each year some random event hits the farm — some of them are good news, but mostly are bad ones — and with these events we can have an idea of what kind of problems a third world farmer have to deal with.
It is not a really difficult game – even if you fail on managing your resources, some kind of opportunity to make a little easy money will appear, as renting some low productive land to a military camp, or to perform some typical dance to tourists. It is not so difficult to save some money and begin to spend with permanent improvements: first, animals and tools, then, building infrastructure or supporting schools or hospitals.

The player must work with floating prices of grains and products in the market, and it will set his annual profit. There is no way to know what is going to happen next, so the player must decide and hope for a good season. Some samples of problems are: civil war, cattle disease, cotton harvest fail of corrupt officials. Some of the disaster won’t have any effect on the player: if he has no cotton plantation, he will have no problems when cotton harvest fails.

The game finishes when the player builds all the improvements around the farm: it means the farmer and his family will have better chances of having a good life.

4.3 **Comparing the games learning potential**

At first, the games have different content. Although both tell the player about poor family’s life, the content is different because the challenge is so. The challenge qualifies the interaction between player ant content, and has a central role in an educational game [18]. The 3rd World Farmer is a farm simulation game, so the player learns about farming tools and required infrastructure, and the cultivated plants and animals in Africa. Each of these elements can be bought and the player must understand every function to choose between one and another. To know the advantages of buying a well or a pig is fundamental, and it makes the game actually educational – to learn the game is the same as learn the content. The challenge is farming, so is the main content.

As a family simulation game, Ayiti challenge is about how to administrate the family members, and which activities are better to invest in: education, money, health or community improvements? The content is the whole mechanic, how the everyday elements are connected. Some study will make possible a better job and more money to all family, but one will only have a chance to study if the others work hard to pay their cost of life and study. So the challenge is about surviving with family resources, the content is about their whole life: education, money, job, health and happiness, and not just about the job: it is why this game teaches the poverty idea better than the other.
The challenge may define the main content to be learned, but the context, pictures and texts that describe the situation also help to the learning experience. Both games have random events that make us know what kind of problems suddenly can happen with the families, and it works better because each event has real consequences in the player resources and some of them requires a specific reaction of the player: it gives motivation to the player to pay attention on this random events to understand what he must do next. It is a good way to make the player paying attention in the random events, and the player learns about the poverty. But there is some information with no real influence over the gaming results, and it also illustrates the scenario. If the game is engaging and makes sense to the player, he will apply his mind and be interested in all information about it.

There are events that suddenly happen in both games, but they work differently. In the Ayiti game, the events are in some way predictable. If the characters have low health, they will get sick. Hurricane season happens once a year, as Christmas and Easter. If the player knows what can happen, he will pay attention to understand how the game works. In the other hand, the 3rd World Farmer has very random events that player has no way to predict. It gives little control to the player, and it works well because the player can experience the unsafe position of a poor third world farmer: he must spend his resources on something, without having any idea of the future regional events. It is part of the content, and is also the way the simulation works. It is not only strategy, but the feeling of unsafety.

The feeling and emotion need some attention. The games have the potential to make the player emotionally engaged, and to do so the game can use some tools: the character appeal and the music are very important [19]. It is also important when we talk about education, not only because it engage people but also makes the experience more important. If we adopt the Kolb’s [20] model of experience learning, we must understand the player as a complete human, and education must work with his feelings and emotions to be effective. The characters of the games are family members with no special qualities, but in Ayiti game each of the characters are different from the others: their genre and age are important to know what kind of job each one can work in, so the player must care about them, and create link with them. Their faces show the player how they are feeling, and it make the illusion they are alive: the variables of the game appear to be a real problem when the characters begin to cry.

The Ayiti game gives importance to the four main elements: money, happiness, education and health. All of these are important and has real consequences in the other elements: if the man has no education, he can’t find a job that pays well. If he does not have enough money, can’t pay for the correct treatment in the hospital, and his son won’t be so healthy. Every element is important and has a relationship with the others. In the Farmer game, there are very interesting possibilities as having babies, marriage, leadership in the family, going to school or leaving the farm to get a job in the town, but is difficult to understand the effect of it in the gameplay: it seems to be only a detail with no direct relationship with the success of the player. It creates no meaning about marriage, babies and education. If these elements have no relationship with the others as mechanic results, it cannot be so remembered with the experience as something reasonable.

These games are good to illustrate the poverty in some countries because they are simulation games, and try to make the player a real decision maker: to seed peanut or to buy a cow? Can the boy go to school or should him work in the family farm? Each game has a different focus, but both are good samples of integration between game mechanic and content to be learned.

5.0 Conclusion

The analysed games are good simulation games because content and gameplay are connected, so the player can play and enjoy while learns about poverty. It is called stealth education [21], when the player may have fun and possible would not notice he is learning. These initiatives
are good samples of games that are free and may help students to learn about poor countries reality, but it will be more effective if teachers spread and use them with their students. Although these games are good educational games, they can work a lot better with a teacher, suggesting discussion and guidance [22]. Educational games won’t be so effective if teachers are not able to play these games and work with students.

References:
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