

Serious Games

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Introduction

During April and May 2017, I have been taking a course in Serious Games at the Vrije Universiteit, where I am registered as a Master student Physics. The course piqued my interest as I was looking to diversify my education with more computer science-oriented courses that were offered within my curriculum. I soon discovered that Dr. A. Eliens, my lecturer, had an interesting idea of how to teach this course. It included more than just technical study which I am used to as a physicist. I joined up with four other students and, aside from using programming skills, was also encouraged to think about the moral role Serious Games play, as our team started making Harvest Chef as a prototype for Terragon educational games. In this essay I will discuss my thoughts on how Serious Games can be used effectively as a benefit to society. I will also share my thoughts on XIMPEL, the tool we used to make the game, and my experience with the course in general.

On the role of Serious Games in Society

There are many video games that have a clear educational value, and many games that could be considered more serious than others. What constitutes a “Serious Game” then? Especially in the last two decades, Serious Games, not strictly limited to educational games, have been gaining popularity. Examples vary from programs to help children in schools to learn, to massive multiplayer online communities (think of game-like applications such as Second Life by Linden Lab, Inc., 2003, or Moonbase Alpha by NASA in cooperation with Virtual Heroes, Inc., 2010). The most generally accepted definition of a Serious Game is a game that has a primary purpose other than entertainment (Susi et al., 2007). The term “Serious Games” is a bit of an oxymoron in this sense, since gaming does seem to carry the intention of being fun and entertaining. Furthermore, games that do not generally qualify as “Serious Games” may still contain a lot of value for education and socialization.

Apart from this misunderstanding, it is my opinion that Serious Games, and video games in general, can be of great value to the quality of society, for education, research, and business alike. It seems that in recent years society has been focusing more and more on the digital world, with the upcoming of the internet, the smartphone, and Bitcoin just to name a few. Children and, by extension, people in general live inside a system that already requires them to be adept with modern technology and be ready to move rapidly to more advanced technologies. It only seems logical that people grow to adapt to this situation and learn how to make use of it. In other words, modern media will become their learning objective, their source of knowledge, and their platform for communication.

Even when I had just started high school I could see these developments myself. Classmates had apparently developed a great interest in ancient history from playing games like Age of Empires II (by Ensemble Studios, originally 1999), and I had a similar spark of interest while playing Civilization V (Firaxis Games, 2010). Video games, just as well as books or movies, have the ability to inspire us, and communicate the developer's message to the world.

It has been argued before that educational video games drive young students away from their curricular material, and the curiosity and inventiveness that is invaluable to their intellectual development and pursuits (Stoll, 1999). I do not doubt the importance of traditional means of learning, such as lectures, books, and asking questions. It is wrong to think, however, that learning is by definition not supposed to be fun. A healthy balance between entertainment and study can greatly benefit a student, even more so when the entertainment is designed to inspire curiosity.

This is particularly true for people who would otherwise struggle in their education. Having been a student on a special school, I have had many experiences where traditional means of learning were difficult, and noticed other students having the same difficulties. Handicaps like attention deficits, dyslexia, dyscalculia, and conditions like autism spectrum disorder can all present a complication in developing reading, writing, and social skills, as well as the curriculum material. This is where digital multimedia, including Serious Games, can be a great supporting factor.

On the use of XIMPEL

XIMPEL is a platform for creating interactive web pages using your own content such as images, sounds, and videos, designed for the purpose of creating simple games with ease. The platform consists of several parts that allow for smooth integration into any web page. The core is a complex application in Javascript which is required to be installed on the webserver first, and handles the display of content and the storyboard management. The application is invoked within the web page itself, which can be .html or .php.

In order for the application to work, two other files are needed which are both coded in XML. One is the configuration file, which among others contains settings for how the controls of the integrated video player work, and whether the player score is displayed within the page. The other file is the playlist, which ties the content together in a storyboard, and contains the definitions for overlays and variables, such as score and certain game flags (XIMPEL documentation, Bhikharie et al., 2017).

Simplicity is the namesake of the platform. It works fast and effective and is easy to learn how to use. To explore the possibilities XIMPEL provides to make a game, I was able to produce a testing application from content in only a few hours. The playlist is structured in "subjects", which could be considered different panels of the storyboard, each with its own content of an image or video with overlays. Using overlays and conditional "leadsTo"-commands, the game designer can define how a player moves through different scenes, making the platform ideal for point-and-click games.

Any variables used in the game are created as soon as they are mentioned in the playlist, which removes the necessity for separate beforehand declaration of used variables. It should be noted, however, that player scores are displayed outside the XIMPEL application. The score value must be caught with an event handler and displayed in HTML. The platform conveniently allows the game designer to add YouTube-videos directly into the application playlist, so that cutscene can be made quickly. Web pages too can be displayed in a specially designed IFRAME, which my development team used for linking to websites with bonus content. Finally, the documentation is easy to read for

new designers, but also allows for more in-depth information on how to use XIMPEL's features, such as creating custom media types in JavaScript.

While simplicity is XIMPEL's strong suit, it also defines its limitations. It is important to bear in mind, when first using the XIMPEL platform, that although the actions performed by overlays can be conveniently variable, the design of each "subject" is fixed. For example, it is impossible to change the color or text of an overlay in a subject depending on a certain game flag, even though the result of clicking on the overlay may depend on such conditions. My team ran into this problem at some point when we tried to change the color of overlays which had already been clicked. Implementation of this feature would mean defining a separate subject for every possible situation, which for four clickable overlays is fifteen subjects, and for eight overlays, our original design, would be 255 subjects (!). Adding the possibility to set a condition for overlay properties would be, as such, a great improvement to XIMPEL.

Reflection on my work on Harvest Chef

Because I have a background in physics and no formal education in computer science that isn't specifically tailored to physics, it might be surprising that I chose to take a computer science course, and moreover a course on game development which I have no prior professional experience with. Of course, physicists make extensive use of computers, particularly in the field of particle physics. Data has to be acquired fast, and large data sheets require analysis, so that quality hardware is essential and efficient coding greatly desired.

I do however, aside from my formal education, have had a great interest in computers and gaming even before I decided to become a physicist. If I would not pursue a career in research after graduating, I would likely consider a career in programming, but I was afraid that I might not be able to do this without any background. This is one of the reasons for trying to increase my knowledge and skill in computer science during my Master.

My developing team created a game called Harvest Chef, and I did a great part of the coding of the application, but was also involved in brainstorming for ideas. The goal of our project was to create a fun experience for children to learn about how food makes it from the soil to our plates, while gaining more awareness of good nutrition and organic produce. To me this seemed particularly important in a world where we can less and less trust the food we buy in the supermarket on its origin and quality. One thing that inspired me in contributing to this idea was a report I had seen about Dutch farms being funded by homeowners in exchange for produce, making them independent of the market.

After discovering Terragon and its goals to involve children more closely in nature and the possibility of an ecological future, and hearing that our game might be featured there gave our team a surge of inspiration to work with. The aforementioned "community farms" could be considered an idea befitting Utopia: Small communities working together in creating a fair economy that sustains itself, while also reaping the benefits of locally, organically produced food. Something similar, we thought, could be put into practice in Terragon, where young students could learn how to grow crops and see their own results turned into meals by a chef. Albeit a very ambitious idea, it gave our team a good basis for a pitch to sell our concept.

The eventual project delivered was quite different from the first idea our team had discussed, many compromises naturally having been made to fit within the timespan of the course. The original idea

was to allow the player to choose from a large selection of ingredients, and answer a simple question on the nutritional value and culinary use. For example, for tomatoes one would have to decide whether to use a green or a red tomato, and for carrots whether to use the top or the root. After choosing the ingredients and answering the questions, the player would be presented with a resulting dish, which would be great, good, okay or bad depending on their choices. I expected this would give the game a great replay value, as players would want to retry the game with different combinations of ingredients.

Primarily due to the limitations of the platform used and the time frame left to work on the project, we had to reduce the choice of crops a lot, and the questions became more trivia-like, though still focused on the act of growing and harvesting crops. A player could earn points by answering questions correctly and, depending on their score, earn different ranks as a chef. While this idea fits the required theme of Terragon educational games quite nicely, it also has a lot less of the replay value we originally intended.

For me, this course was quite challenging, not necessarily due to the workload, but mostly because it involved using skills that I have not harnessed in a professional setting before. Programming and project work in groups was not difficult. I was rather new to creating a portfolio and adding creative ideas to professional work. What I knew about game design originated largely from projects I have worked on in my spare time, which might not qualify for a formal course. Judging from the feedback I received from lecturers, fellow developers in my team and members of other teams, my work was satisfactory despite my lack of experience. The course was definitely an opportunity for me to practice expressing creative ideas and conducting moral discussion, and even gaining some technical skills in web design. I am happy to have been able to diversify my skillset, and my curriculum, with the Serious Games course.