Invasion of the Shadows
Creating a Computer Game

MYP Personal Project

By: Hrithik Shah
Student number: 635321
Supervisor: Ms. Snyder
Turner Fenton Secondary School
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Criteria A: Investigating

A.1 Goal

The goal of this personal project is to create a fully functional single player computer game that will incorporate a historical storyline to guide and progress the player through the game. The computer game will act as a medium to educate the game's players about several ancient civilizations by gamifying the learning process. I consider that this endeavor will be difficult to complete, as this will be my first time making a computer game. I will have to learn many skills from scratch and manage my time well in order to successfully complete this project.

A.2 Personal Motivation & Context

This project is important to me for various reasons. Foremost, in my childhood, I played many video games. As a result, I was always fascinated by them and was curious on how they were made. By undertaking this project, I would have the chance to explore my curiosity and learn more about game development. Secondly, by creating a computer game I would get the opportunity to learn about the fundamentals of computer science and animation, both of which are disciplines that I would like to pursue in the future.

A.3 Global Context

	Orientation in space and time	Where we are in place and time	Inquiry into orientation in place and time; personal histories; homes and journeys; the discoveries, explorations and migrations of humankind; the relationship between and the interconnectedness of individuals and civilizations, from local and global perspectives

The focus of my computer game is the educational experience for players. Since the computer game follows a Role-Playing-Game (RPG) format, players will learn about history through their character in the game by virtually experiencing and interacting with the ancient civilizations of the world. In relation to global context, the game is most closely associated with orientation in space and time.

A.4 Research

Most of my research for the development of my game came from YouTube tutorials. Channels such as GamesPlusJames[1], MyBringBack[2], and GucioDevs[3] helped with learning the basics to the game development software and the basic structures of code.

GamesPlusJames was the main source of all the game-making tutorials. On this YouTube channel, James had a playlist of videos where he was creating his own game. By watching each video several times, I was able to replicate what he showed viewers, and create the building blocks of my game. This source was very helpful, as each video made by the editor was thoroughly explained. Also, every video was based on an idea that every game developer would want to incorporate into their game, such as a basic score system and boss battles. MyBringBack was similar to GamesPlusJames as the author of this channel also created a series of videos on the basics of game development. In relation to GamesPlusJames, MyBringBack explored many other elements of the software. On the other hand, GucioDevs had a series of tutorials for building more

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[1] "Gamesplusjames." YouTube. YouTube. Web. 7 Nov. 2015. https://www.youtube.com/channel/UCyBsvsU7uiurMiBZIYXvnyg
[2] "Mybringback." YouTube. YouTube. Web. 7 Nov. 2015. https://www.youtube.com/channel/UCHALE0WtcSB1E0dt7IaGqWA
[3] "GucioDevs." YouTube. YouTube. Web. 7 Nov. 2015. https://www.youtube.com/channel/UC4MDTn6WkqvBfBW_4cFZp2g

complex games. In one of the tutorials, he shows how to make a way for enemies to attack the player and how to make the player melee attack enemies (basically kick, and punch or in my game slash and stab). This was vital for my game as the majority of attacks my player could perform would be of melee form.

An online resource where I could get help for my coding was from Unity Answers[4]. This is a website where programmers that made games using Unity[5] could ask questions and receive answers for their coding issues. As I am an amateur programmer, this website was very useful because I could ask questions on how to fix my code whenever I could not figure out a solution myself.

MapleMe[6] and BannedStory[7] are websites that helped with my animations for my enemy characters. These sites took animations from a global, multiplayer game called Maplestory[8]. Most of the animations that I used from these sites were added features to my game. Initially, I did not expect to have these extra animations due to their inherent complexity. I felt that the only aspect that could be improved was the user interface. At times, I found that I was confused as to how I was supposed to find and edit various animations.

History-related books and websites were crucial in developing my storyline. They also assisted me in deciding which ancient civilizations I would integrate into my game. Philip de Souza's *The Ancient World At War*[9] gave readers an idea on what each civilizations military was like. This supported my choices for the most formidable civilizations in history. The website on the Legends and Chronicles of Ancient Warriors further aided my choices for incorporating the various civilizations into my game since it gave me insight into the characteristics of the warriors from each civilization.

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[4] "The Best Place for Answers about Unity - Unity Answers." The Best Place for Answers about Unity - Unity Answers. Web. 7 Nov. 2015.
[5] "Create and Connect with Unity 5." Unity. Web. 7 Nov. 2015.
[6] MapleMe's website is down.
[7] "BannedStory 4." BannedStory 4. Web. 7 Nov. 2015.
[8] "MapleStory | Play Now." MapleStory | Play Now. Web. 7 Nov. 2015.
[9] "The Ancient World at War: A Global History", by: Philip De Souza (2008), London: Thames and Hudson

Criteria B: Planning

B.1 Criteria

Criteria for my Game:
1. Create a computer game that contains at least 10 levels
2. Include a historical storyline based on ancient civilizations throughout the game
3. Must contain a character that acts as guide to the player throughout the game
4. Enemies should be able to chase and attack the player
5. The player should be able to change clothes for every change in ancient civilization
6. Player must have a total of 2 attacks
7. The background and music of each level should change depending on the civilization
8. There should be a fair scoring system
9. The game should include a main screen as well as a pause menu screen
10. At the end of the game, there must be a final boss battle

B.2 Development Process Plan

This chart outlines the deadlines for the various stages of my project:

Process Item	Planned Start Date	Planned End Date	Actual Start Date on Managebac	Actual End Date on Managebac
1. Plan Storyline and game features	March 1, 2015	April 1, 2015	February 5, 2015	June 6, 2015
2. Design all character sprites	April 2, 2015	May 1, 2015	June 6, 2015	July 10, 2015
3. Complete making game	May 2, 2015	August 31, 2015	July 10, 2015	September 2, 2015

(Refer to Appendix D: Thursday, February 5, 2015)

Below are some pictures that were taken during the development of my game:

(Refer to Appendix C: August 14, 2015)
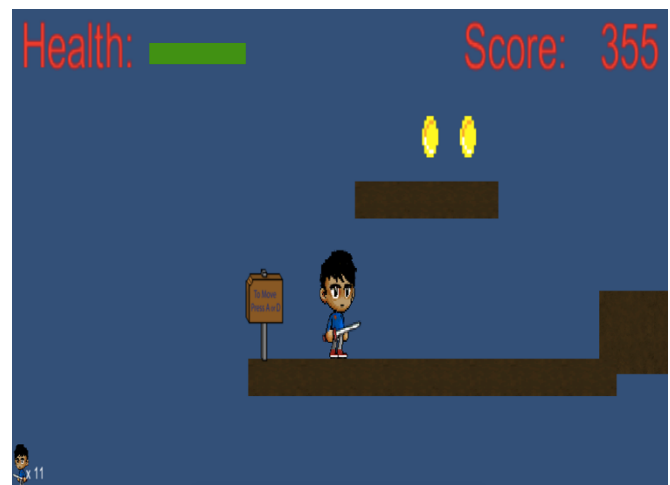
Early Stages of Game
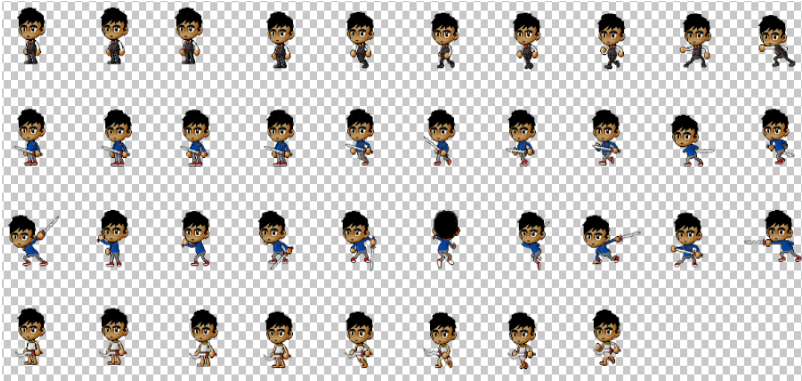
Different outfits for my character   First Drawing of Character

B.3 Self-management Skills

At the beginning of my project I was unsure of myself. I was worried about whether or not I would be able to carry through my initial plan as I discovered that creating my own game would be more difficult than I imagined. I was doubtful to the extent that I decided not to change the clothes and weapon of the player every time he reaches a new ancient civilization (Refer to Appendix A: June 6, 2015 for more information). However, once I started to work on my game, I realized that making it is far easier than I expected. By the end of August, I anticipated to finish my game, without the ability to accessorise my player with clothing and weaponry. Additionally, I learned that if I work hard and remain disciplined, I could achieve my plans with little to no setbacks.

Most of my time estimates for the game development time were off. I either overestimated or underestimated them, causing me in the end to have difficulty finishing the project before my deadline (Refer to Appendix B: August 28, 2015). Nonetheless, the experience of creating a game as a long term project really helped me by giving me a taste of how long term projects are executed in reality. I learnt that there will always be times when unexpected events may arise, causing setbacks to your project. Ultimately, it is better to account for such unexpected events and accordingly allocate time for the different stages of the project.
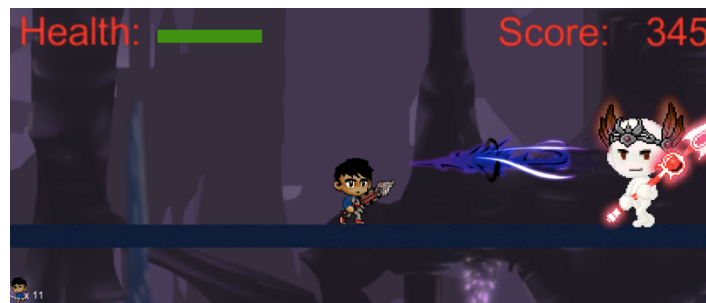
Criteria C: Taking Action

C.1 Product Created

The final product of my personal project was a computer game that aimed to educate its players about ancient civilization warriors.

Main Menu for my game

Last level of my game

C.2 Thinking skills

Problem solving is a skill that all programmers need and use actively. It is a crucial aspect that ultimately helps them accomplish their goals proficiently. My problem solving skill really developed over the course of this project. I became familiar with different ways in which to solve a problem. For instance, in game development there is a notion of decomposing a complex problem into simpler sub problems. The idea of breaking down a problem into smaller problems helped me identify the underlying pieces that were crucial to solving the problem. (Refer to Appendix E: July 17, 2015).

In additional, through the development process I learnt that problem solving does not have to be an individual task. In the beginning, whenever I came across a challenge, I would try to solve it myself. However, if I continued to be unsuccessful, I would just leave it. But now instead of just sitting around waiting for a solution to pop into my head, I search the internet for help because within the coding community, there is always someone out of the vast sea of programmers who would have come across the same problem as me. Hence, I learnt that through online coding platforms, programmers indirectly help each other find solutions, as there is always a solution for everything in the world.

C.3 Communication & Social skills

Clarity of thought is important while creating a computer game. My thoughts must be expressed well enough to connect with the player and make their game-play experience as seamless as possible. The player must be compelled to play the game until the very end. Every idea that I had for the game had to go through a translation. By this, I mean that all of the ideas that I had were abstract and could only become reality after converting them into a coding language that could be understood by the computer. Hence, it was imperative for me to have clarity in my thought process in order to be able to successfully of translate them into machine code.

When a programmer codes, he or she usually writes comments for whatever they are coding. This is to help them recollect what they were working once they resume their project after a period of time. Since my project would take around over a month to code, I used comments in my code so that I would not forget what I was working on. It also assisted me in debugging my code because comments acted as markers to help pinpoint an error in the numerous lines of code I had. Additionally, the use of comments also helps aid in clarity of thought between programmers who are collaborating on the same project at different times.

Criteria D: Reflecting

D.1 Criteria Evaluation

This following chart indicates the evaluation of my criteria set out in Section B.1:

Criteria	Rank (7)	Justification
Create a computer game that contains at least 10 levels.	7	I have 10 levels in my game (which includes a tutorial level).
Evident storyline throughout the game.	6	Throughout most of the game, players can find an evident storyline, although in some parts of the game this is not true. Few testers for my game were confused as to what was really happening in the story.
Must contain a guide that leads the player through the game.	7	There was a guide present in almost every level, giving hints and aiding players to overcome challenges.
Enemies should be able to chase and attack the player.	5	Enemies can chase player once he or she is in range. Attacking the player was the part of the game that I need to alleviate because
The player should be able to change clothes for every change in ancient civilization.	0	I did not incorporate this into my game because I found that this would take too much time, therefore I gave it a zero.
Player must have a total of 2 attacks.	7	The player does have 2 attacks; a ranged and a melee.
The background and music of each level should change depending on the civilization.	7	This is the case throughout my game.
There should be a scoring system.	7	All aspects of my games contain this.
The game should include a main screen, as well as a pause menu.	7	There is a main screen and a pause screen within my game.
At the end of the game, there must be a final boss battle.	7	At the end, the player does fight a boss. This part contains all the articles that are usually present in most boss battles.

D.2 Deeping Knowledge of Global Context

This project of creating a computer game with a time travel theme has helped me to learn a lot about the orientation of time (global context named in Section A.3). To create this game, I had to research ancient civilizations of the world. During this period, I came across a statement made by Dr. Seuss, where he said, "How did it get so late so soon?"([10]) I think what this means is that human beings do not really have a sense of time, and that we tend to forget the importance of it.

While researching for my game, I was marveled by the work of the people that lived in the ancient world. They had used their time so wisely, and created after-images of themselves as we see today through their grand monuments, like the Pyramids of Giza or the Roman Coliseum. Even while working on my game, I procrastinated many times. In the end, I did finish the game, but only after I realised the amount of pressure that would build up during the school year, if I had not finished my game in the summer. Once I completed the project, I reflected that if I had not procrastinated I probably could have finished the project much earlier. If this would go through every human beings' minds, then I believe that we as a society will be prosperous.

D.3 Reflect on IB Learner Profile

Taking risks and being a thinker were two characteristics that I think demonstrate the purpose of the personal project. Taking risks is a large part of this experience because this will determine if you go into the IB Diploma. If you pass the project, then you will get to continue the IB program, and if you fail, the you will be removed. Picking a topic to pursue for the personal project is where the Risk Taker characteristic is present. To choose a topic one needs to take a risk because it is essential that the topic is something never done, but still within the limits. When I chose to make a computer game for my personal project, I was taking a tremendous risk because I knew little to nothing on how to make a game. Although I knew that if I learned enough within the time constraints, then I would be able to accomplish my goal.

The second characteristic of being a thinker was present in every aspect of my personal project experience. From the start, I had to think of a topic to pursue and identify the outcome of my pursuit. Then I had to determine steps I needed to take toward the outcome of my pursuit. Finally, I had to embark on my pursuit to achieve my outcome. The project actively forced me to think, especially during the process toward achieving my outcome of completing the computer game. I constantly came across problems in writing the storyline, coding the gameplay, character animations and even problems in meeting my own deadlines. To overcome all of this, it was crucial for me to utilize my thinking abilities to ensure I was moving towards my end goal despite the obstacles that came my way.

Although all the characteristics from the IB learner profile play a role in this experience, overall I consider risk-taking and critical thinking as valuable assets that contributed collectively to in successfully completing this ambitious project.

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[10] Dr. Seuss Quote from Goodreads, http://www.goodreads.com/quotes/180800-how-did-it-get-so-late-so-soon-it-s-night

Appendices

Appendix A: June 6, 2015

I feel that the game that I have in my mind is going to be to big for me to make in such a short time. It should be 10 times more simple than it is right now. All I have done is my animations, and I feel that it will take too much time to make the game. Therefore, I need to rethink my idea with the same topic.

My idea before:

Aliens attack the Earth, and the main character (player) has to go back in time to acquire scrolls placed in ancient civilizations. Once all these scrolls are united the player will find out a way to defeat the enemy. The main character will change clothes in every new civilization that he travels to.

My idea now:

Aliens still attack the Earth, and the main character (player) has to go back in time to acquire scrolls placed in ancient civilizations. Once all these scrolls are united the player will find out a way to defeat the enemy. The main character will not change clothes in every new civilization, he will just have the same clothes.

Animations to complete now:

Warriors from:

Egypt- Pharaoh

Rome- Roman gladiator and Roman general

Ancient China - Samurai, and Ninja.

Appendix B: August 28, 2015

The last levels of my game are in progress. I have yet to fully complete my storyline, plus create a guide for my game so the player knows what is happening.

These next few days, I really have to work overtime, and get my game ready as I am approaching the deadline. I need a way the player knows what is happening, which will be done using a NPC (Non Player Character). Whenever the player approaches this NPC, there will be a text box that appears, telling the player what to do.

Appendix C: August 14, 2015

I have three weeks to go and I still need to figure out how to make my enemies chase my player and attack him. I found some tutorials on how to make them walk but that was about it. The only tutorial that got me close to what I wanted my enemies to do was one where the enemies would fire projectiles at the player whenever the player was close. I realized that to make my enemies act the way I wanted I would have to do it myself.

First, I created a variable float (this variable uses decimal numbers such as 3.34) called range, which would find the distance between the designated enemy and the player. If the player starts to move closer to the enemy than the range will start to decrease. Once the range has reached a certain value, and the player is close enough to the enemy, the enemy will attack with its designated attack animation, dealing damage to the player.

Appendix D: Thursday, February 5, 2015

Start of a Great Experience
Finally, I get to start my Personal Project! I am so excited. Although, I am also worried because there is so much to do. I don't think I'll be able to finish on time. Hopefully, I will be able to finish the project on time.
Firstly, I will have to create a plan on what I need to do for my project and when I want to finish it by.
Timeline for Project:
- Get approval for project by February 16th.
- Start planning storyline, design all game features after February 16th.
- Should finish everything by the beginning of March
- Use Photoshop to design and draw all characters, settings throughout gameplay. Finish by beginning of May.
- Get acquainted with Unity and learn a programming language (C#, JavaScript, Boo) on Khan Academy, or Codecademy by beginning of July.
- Finish making the game by August end.

Appendix E: July 17, 2015

While creating the enemy in my game, some things in my game were not functioning the way I wanted them to function, for example; the enemy character kept turning and flipping whenever my main character came close to it. After doing some more research I found that I should have created my game with settings set for a 2D game (which was what I needed). My settings were set for a 3D game. Therefore, I started to make my game all over again in 2D settings.

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