

Serious Game Based on MMO-RPG

by

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Abstract

Serious games and game-based learning have transformed education, leveraging interactive technologies for enhanced engagement and learning outcomes. This evolution emerges against a backdrop where serious games tap into intrinsic motivation. "Odysseus Journey" is a novel educational Role-Playing Game (RPG) developed for secondary school students to immerse themselves in Homer's epic, "The Odyssey." The thesis addresses integrating classical literature into modern education, providing an engaging platform for exploring the cultural contexts of the famous epic poem. The thesis develops an innovative educational RPG, developed using the Unreal Game Engine, offering a dynamic interactive experience for students. This game-based learning experience reshapes traditional educational approaches, allowing students to explore virtual realms and interact at their own pace. Literature review reveals the potential of serious games, emphasizing experiential learning. Beyond classical literature, the success of "Odysseus Journey" underscores the broader potential of serious games to revolutionize education.

Keywords: Educational RPG, Greek Mythology, Unreal Engine, Interactive Learning, Cultural Exploration

ΠΕΡΙΛΗΨΗ

Τα εκπαιδευτικά παιχνίδια και τα παιχνίδια βασισμένα στη μάθηση έχουν μετασχηματίσει την εκπαίδευση, εκμεταλλευόμενα τις διαδραστικές τεχνολογίες για να ενισχύσουν την συμμετοχή και τα προσδοκώμενα αποτελέσματα από τους συμμετέχοντες. Αυτή η εξέλιξη προκύπτει σε ένα πλαίσιο όπου τα εκπαιδευτικά παιχνίδια αξιοποιούν τα εγγενή κίνητρα. Το "Ταξίδι του Οδυσσέα" είναι ένα καινοτόμο εκπαιδευτικό παιχνίδι ρόλων (RPG) που αναπτύχθηκε για μαθητές του γυμνασίου για να εμβαθύνουν στο έπος του Ομήρου, "Η Οδύσσεια". Η διατριβή αφορά την ένταξη της κλασικής λογοτεχνίας στη σύγχρονη εκπαίδευση, παρέχοντας ένα ενδιαφέρον πλαίσιο για την εξερεύνηση των πολιτισμικών πλαισίων του διάσημου επικού ποιήματος. Η διατριβή αναπτύσσει ένα καινοτόμο εκπαιδευτικό RPG, δημιουργημένο με τη χρήση της μηχανής παιχνιδιών Unreal, προσφέροντας μια δυναμική διαδραστική εμπειρία για τους μαθητές. Αυτή η εμπειρία μάθησης βασισμένη σε παιχνίδια ανασχηματίζει τις παραδοσιακές εκπαιδευτικές προσεγγίσεις, επιτρέποντας στους μαθητές να εξερευνήσουν εικονικούς κόσμους και να αλληλεπιδρούν στο δικό τους ρυθμό. Η ανασκόπηση της βιβλιογραφίας αποκαλύπτει το δυναμικό των εκπαιδευτικών παιχνιδιών, επικεντρώνοντας στην βιωματική μάθηση. Πέρα από την υπάρχουσα βιβλιογραφία, την επιτυχία του "Ταξιδιού του Οδυσσέα", υπογραμμίζει την ευρύτερη δυνατότητα των εκπαιδευτικών παιχνιδιών να φέρουν επανάσταση στην εκπαίδευση.

Λέξεις κλειδιά: Εκπαιδευτικό RPG, Ελληνική Μυθολογία, Unreal Engine, Διαδραστική Μάθηση, Πολιτιστική Εξερεύνηση

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Some times in your life there are situations that hold you back from your goal but in the end when you know what you want, it is certain that you will succeed.

Table of Contents

Abstract.....	page 4
ΠΕΡΙΛΗΨΗ.....	page 5
Acknowledgments.....	page 6
List of Figures.....	page 9
List of Tables.....	page 10
List of Abbreviations.....	page 11

CHAPTER 1: Introduction

1. Introduction.....	page 13
1.1 Scope and Aims of MSc Thesis.....	page 14
1.2 Thesis Volume Overview.....	page 15

CHAPTER 2: Background and Literature Review

2.1 Role-Playing Games (RPG)–Massively Multiplayer Online Role-Playing Games (MMORPG).....	page 17
2.2 Education Games (LGS - Learning Game System).....	page 19
2.3 Evaluating the educational potential of PRGs.....	page 21
2.4 Role-Play Games as Learning Environment.....	page 23
2.5 Storyboarding.....	page 24
2.6 Digital means for Education of History & Mythology.....	page 25
2.6.1 Age of Mythology & Age of Mythology: The Titans.....	page 26
2.6.2 God of War.....	page 26
2.6.3 Godfire: Rise of Prometheus.....	page 26
2.6.4 Disney: Hercules.....	page 27
2.6.5 Warriors: Legends of Troy.....	page 27

2.6.6 Wrath of the Gods.....	page 27
2.7 Raising Cultural Awareness of Students Through RPG EduGames for Greek Mythology.....	page 29
CHAPTER 3: Unreal Engine 4 Description	
3.1 Creation of Unreal Engine.....	page 33
3.2 Uses of Unreal Engine.....	page 33
3.3 Advantages of Unreal Engine.....	page 34
3.4 Disadvantages of Unreal Engine.....	page 34
3.5 An Overview of the Unreal Engine 4’s User Interface A Look at the Tab System.....	page 35
CHAPTER 4: The Case of Odysseus journey - Role-Playing Game	
4.1 Analysis.....	page 39
4.2 Design and Implementation.....	page 40
CHAPTER 5: Case Study – Level Underworld	
5.1 Odyssey, Rhapsody Α:Odysseus looks for Tiresias.....	page 50
CHAPTER 6:Conclusions and Future work	
6.1 Conclusions.....	page 75
6.2 Future work.....	page 75
References.....	page 77

List of Figures

Fig. 1.1 Game-based learning at the intersection of Learning, Games and Simulation	page 14
Fig. 2.1. Dualistic Model of Passion by Robert Vallerand (2003).....	page 19
Fig. 2.2 Games: a. Age of Mythology(2002), b. God of War(2005) and c. Godfire: Rise of Prometheus (2014)	page 26
Fig. 2.3 Games: a. Disney: Hercules (1997), b. Warriors: Legends of Troy (2011) and c. Wrath of the Gods (1994)	page 28
Fig. 3.1 The Editor of Unreal Engine.....	page 36
Fig. 5.1 – 5.3 Virtual environment of the application from the implementation of the game.....	page 70
Fig. 5.4 – 5.5 Virtual environment of the application from the implementation of the game.....	page 71
Fig. 5.6 – 5.8 Virtual environment of the application from the implementation of the game.....	page 72
Fig. 5.9 – 5.10 Virtual environment of the application from the implementation of the game.....	page 73

List of Tables

Table 2.1 Game Comparison Table.....	page 28
Table 4.1 Example game flow (Sequence diagram of Check point 01)	page 39
Table 5.1 Storyboard of Level 08 “Teiresias”	page 53

List of Abbreviations

- RPG: Role-Play Games
- MMORPG: Massively Multiplayer Online Role-Playing Games
- AI: Artificial Intelligent
- NPC: Non-Player Characters
- D&D: Dungeon & Dragons
- TSR: Tactical Studies Rules
- GM: Game Master
- L2: Lineage 2
- OP: Obsessive Passion
- HP: Harmonious Passion
- LGS: Learning Game System

CHAPTER 1
Introduction

1. Introduction

In recent years, the landscape of education, training, and problem-solving has undergone a significant transformation, thanks to the emergence of serious games. Serious games represent a paradigm shift in the way we engage with digital technologies, leveraging the immersive power of video games to achieve educational and practical objectives. These interactive digital experiences offer more than just entertainment; they provide a potent platform for learning, skill development, and tackling real-world challenges in engaging and captivating ways.

Serious games are designed with specific educational, training, or problem-solving goals in mind, harnessing the inherent motivation and engagement that players exhibit while immersed in gaming environments. By integrating game mechanics, narrative, and interactivity, serious games offer an effective and enjoyable medium for fostering skills and knowledge acquisition across various domains, from education and healthcare to corporate training and simulation. In this exploration of serious games, we delve into their multifaceted nature, examining how they have permeated diverse sectors and their potential to revolutionize learning and problem-solving. Drawing upon a growing body of research and practical applications, we seek to illuminate the innovative approaches, benefits, and challenges inherent in this dynamic field. As the educational and professional landscapes continue to evolve, serious games stand poised to play an increasingly pivotal role in shaping the way we acquire knowledge, skills, and competencies (Deterding et al, 2011, Gee, 2003, Hamari et al., 2014, Steinkuehler et al., 2008, Zyda, 2005).

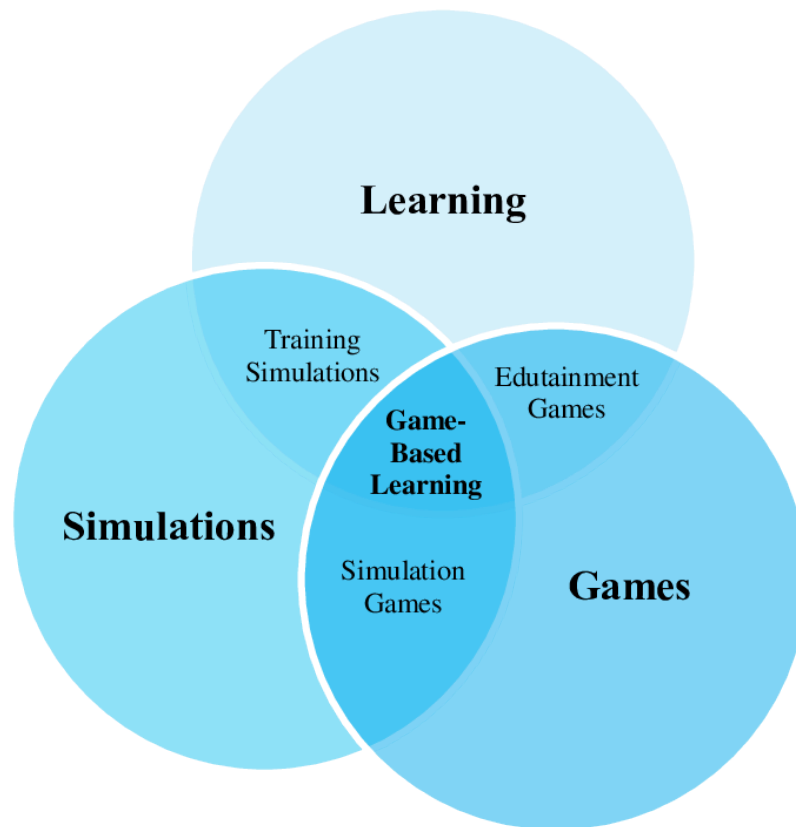


Fig 1.1 Game-based learning at the intersection of Learning, Games and Simulation (Martens et al, 2008)

1.1 Scope and Aims of MSc Thesis

The purpose of the current Master Thesis is to combine commercial and entertaining games with educational games. In other words, a student should be able happily playing a game but at the same time he gains the necessary knowledge and skills that each game offers him. From personal experience, RPGs or even better MMORPGs can transmit knowledge about the history of the game which will be imprinted in the memory of the student even without his knowledge just by playing and having fun with the computer game. The central objective of this Master Thesis is to differentiate the theory of serious games, it is the learning of the user and not his entertainment. Therefore, the goal is to educate the user but through his fun and interactive experience in an RPG environment.

1.2 Thesis Volume Overview

The current MSc Thesis is organized by the following Chapters with their corresponding descriptions:

Chapter 1: Introduction

Chapter 2: Background and Literature Review

Chapter 3: Unreal Engine 4 - Description

Chapter 4: The case of Odysseus journey - Role-Playing Game

Chapter 5: Case Study – Level Underworld

Chapter 6: Conclusions and Future work

References

CHAPTER 2
Background and Literature Review

2.1 Role-Playing Games (RPG)–Massively Multiplayer Online Role-Playing Games (MMORPG)

Role-Playing Games (RPG) are 3D games wherein simulate an imagine world or a real word in which there are 3D characters. The player takes a specific role at the game (a wizard, templar or even an elf ranger) with purpose to act at that role in the world of the game. An important point is that the player embraces a character role (the real player to be the fantastic player).The RPG usually are level-up games in which characters (players) start from scratch (level 1) until the ultimate level at the game. The character receives experience to increase his level by killing monsters and by complete several quests. Quests are missions that unfolds a whole story of the game and player must discover it by its completion. Every quest that player completes, the game reward him with special items that he needs during the game (weapons, armor, food, etc.) and with experience (if RPG is built with level system). Also, the common RPG games are built with compact system to simulate the battles in the world. Compact system makes Artificial Intelligent (AI) character or Non-Player Characters (NPC) to conflict with player's character. Furthermore, NPC communicate with players throw dialogue system, the same system which starts their quest (Kratochvil, 2014).

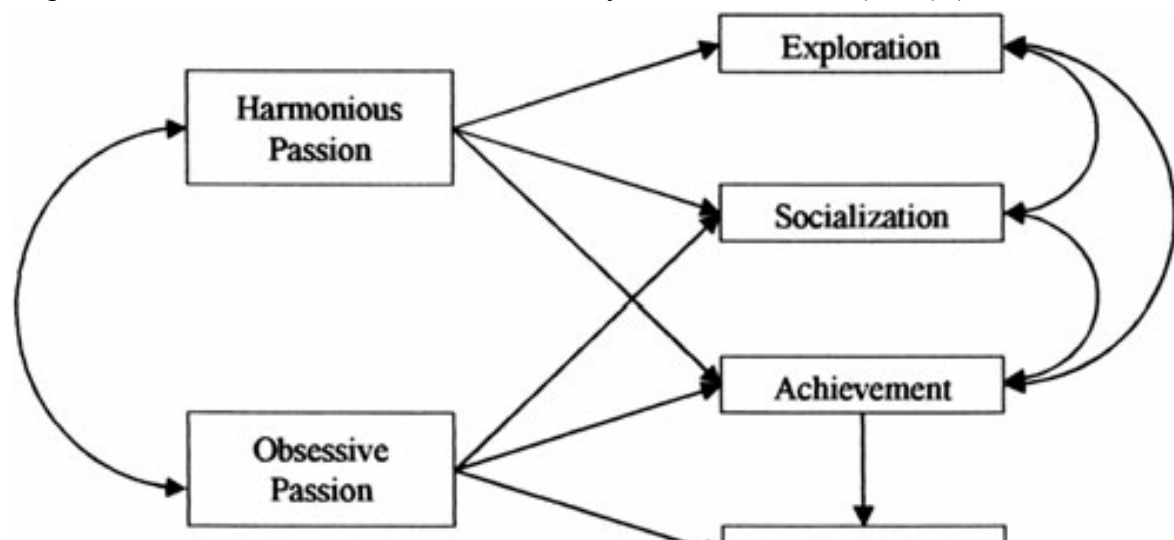
“Modern RPGs” starts in the middle of ‘70s with base the rulesets of fantasy war games, which are dated even from 16th century. Players choose and create their character based on special features of each character in the game. Dungeon & Dragons (D&D) was the very first modern RPG published in 1974 by Gygax's and Tactical Studies Rules (TSR) company (Kusner, 2008). After four decades and despite the negative comments from the press, even those who never play D&D, everyone knows the game as the father of RPGs. A remarkable game of that era is the Diablo which is one of the most important and famous RPG made by Blizzard North at the end of 1996. Furthermore, Diablo still remain one of the critical and most significant RPGs in the history of games with latest title series in the year 2012 the Diablo III and the expansion in the year of 2014 Diablo III: Reaper of Souls.

MMORPG is the evolution of RPGs, from the initial Massively Multiplayer Online Role-Playing Games. MMORPGs are just like a normal RPG but even better, because just as its title say it is a multiplayer game and even more a massively game which

practically means that at the same time a normal server can hold about 4,000-5,000 players, and in some case even more than 10,000-11,000. But why MMORPGs are so important? This happens because players can interact each other with real player, real people and not with a NPCs as like normal RPGs. That is very important because players must count to each other and create allies in the game and even more to grow friendships in real life. The youngest can learn in that virtual world the meaning of cooperativeness, teamwork, sociability and even more the meaning of trade.

As it was mentioned before, MMORPGs are just like RPG but what more; what is the different in the virtual world apart from interacting with other players? One main difference is the ability to create groups of alliances in the game, as guilds and clans to fight against other groups or against anything else in the game. With that system, the players have some confidence that they have people to support them when they need and that's how the friendship grows among players and sociability. One also important difference between an MMORPG and RPG is the Worlds Event. Those events start from Game Master (GM) of the server and usually is weekly or even monthly. In those events players call in epics battle to defeat Elite Monsters (Bosses) or battle between players (Arena Battle), complete specific story line quests of the game (practically the significant story of the game) and even more a conquest of a castle like Lineage 2 (L2). In L2 the leader of a clan can participate in upcoming battle against another clan to conquest the castle that another clan own it. The leader of the winning clan is the king of that castle until loose it from another clan.

It has been confirmed that the players and most of all the youngest players have passion for that kind of games. Many researches shown that passionate gamers grow the ability to interact with other people even in their real life and to collaborate with them and in many cases, make a few of them unfold some kind of leadership. Even more, they develop skills as answers riddles, have strategy plans etc. A good approach of passion is the Dualistic Model of Passion by Robert Vallerand (2003) (Fuster et al.,



2014). According with Valler and the are two type of passion: Harmonious Passion (HP) an Obsessive Passion (OP). This model is a different approach to understand how people bent for that kind of activity and how many time spend for that. Both types of passion shown as that players have the need that kind of activity and exploration. The HP create a curiosity that moves the interest of the players and motivate them to participate with their willing. It also grows the levels of exploration, socialization, and achievement, in that order. On the other hand, OP speak for the unsaturated need of the players to participate in any kind of action just because it loves that. It also grows as the HP respectively the levels of dissociation, achievement, and socialization in that order.

Fig. 2.1. Dualistic Model of Passion by Robert Vallerand (2003)

2.2 Education Games (LGS - Learning Game System)

Education Games or else Serious Games are new kind of games based on education. Serious Games the last decade due to the widespread use of internet and fast-development of digital games those games have rapid evolution. Furthermore, it is not only to the school education, but targets many other fields as for example health care, military defense, scientific research, etc. However, there are many arguments that oppose the use of electronic games because they tend to be addictive to young people because of the time they consume using electronic gaming.

The serious games and digital educational learning aims to create teaching and learning platform for the interaction of students and the direct communication between them with current aim to increase the creativity and learning of the students (Chen et al., 2015). Theworking definition of Serious Games says that games like them do not have entertainment or fun as primary purpose but rather than an educational purpose. This doesn't mean that serious games should not be entertaining. Playing the game triggers learning processes (Ahrens, 2014).

The serious games and educational learning games represent completely, the term of “gamification”, since their creation serve educational purposes that aim the education of young people and to give them an interesting motivation for learning [6]. In the last years, the term of ‘gamification’ appeared as an expression of communication in gaming in our lives.

Benefits of Serious Games

The use of serious games has many advantages and can be transformed into powerful teaching tools. These advantages are:

- Supporting the development of various skills such as strategic thought, planning, communication, cooperation, collective decisions and negotiation skills.
- Strengthening of the acquired knowledge and the degree of duration.
- Adaptation of the learning experience, according to the characteristics of student, style and level of learning.
- Meet learning which take place in a context that makes sense for the game.
- Support team bonding

The benefits of the games did not stop there, because players can improve recognition speed and problem solving, decision making, improve short and long term memory, and an increase in social skills because players work together (Freitas and Liarokapis, 2011). Serious games are widely accepted and used in many areas. As it was mentioned above, games can be used to learn a subject, develop or strengthen skills, expression of ideas, changing attitudes and behaviors.

Of course, there are negative views on the effectiveness of serious games that claiming that there is a lack of empirical evidence. Nevertheless, in two major studies in the UK and the US show that the learning techniques beyond the traditional -conventional methods have shown positive results. All studies performed in serious games show that they help to improve and change the behavior of students with the ability to attract not only the young and the older students aiming not only 'experienced gamers' but also and non-familiar gamers (Freitas and Liarokapis, 2011).

2.3 Evaluating the educational potential of PRGs

Evaluating the educational potential of Pedagogical or Educational Role-Playing Games (PRGs) based on existing literature reveals a wealth of insights and findings. Researchers have conducted numerous studies to assess the effectiveness of PRGs in various educational contexts. Here are key themes and considerations drawn from the literature:

1. Enhanced Engagement:

- Literature consistently highlights the ability of PRGs to engage learners. These games often create immersive environments that promote active participation and motivation (Steinkuehler & Duncan, 2008).
- PRGs provide a sense of agency to players, allowing them to make decisions, solve problems, and explore consequences, which can lead to deeper engagement (Dickey, 2005).

2. Content Mastery:

- Studies have shown that PRGs can effectively convey educational content and promote knowledge acquisition (Squire, 2006).
- When PRGs are aligned with specific learning objectives, they have the potential to enhance content retention (Gee, 2003).

3. Skill Development:

- PRGs are recognized for their ability to facilitate skill development beyond content knowledge. Skills such as critical thinking, teamwork, communication, and decision-making are often cited (Michael & Chen, 2006).
- The literature suggests that PRGs can provide opportunities for practical skill application, contributing to real-world competence (Anderson & Dill, 2000).

4. Assessment and Feedback:

- PRGs can incorporate formative assessments and timely feedback mechanisms to help players gauge their progress and improve their performance (Deterding et al., 2011).
- Research highlights the importance of well-designed in-game assessments to measure learning outcomes accurately (Dickey, 2007).

5. Adaptability:

- Adaptive PRGs that tailor challenges to individual player abilities have been explored, offering personalized learning experiences (Squire & Jenkins, 2003).
- Adaptive features can increase learner engagement and motivation, as the game adjusts to their skill level (Hwang & Wu, 2012).

6. Collaboration and Social Learning:

- PRGs often foster collaboration and social interaction among players. Studies have shown that these games can enhance teamwork and communication skills (Deterding et al., 2011).
- The literature emphasizes the importance of debriefing sessions after PRG experiences to facilitate reflection and knowledge sharing (Anderson & Dill, 2000).

7. Long-Term Impact:

- Some studies have assessed the long-term impact of PRGs, suggesting that skills and knowledge gained through gameplay can have lasting effects (Gee, 2003).
- Research indicates that PRGs can promote deep learning and the transfer of knowledge to real-world situations (Michael & Chen, 2006).

8. Inclusivity and Accessibility:

- The literature underscores the need for PRGs to be accessible to diverse learner populations, including those with disabilities (Fernández-Alemán et al., 2013).

- Cultural sensitivity and inclusivity in PRG content are considered essential to accommodate a global audience (Connolly et al., 2012).

9. Comparative Studies:

- Comparative studies have been conducted to measure the effectiveness of PRGs against traditional instructional methods, with results often favoring PRGs in terms of engagement and learning outcomes (Connolly et al., 2012).

In summary, the existing literature on PRGs provides substantial evidence of their educational potential. These games offer engaging, immersive, and adaptive learning experiences that can enhance content mastery, skill development, and long-term knowledge retention. However, it's important to note that the effectiveness of PRGs can vary depending on the context, design, and alignment with specific educational goals, emphasizing the need for thoughtful integration into educational practices.

2.4 Role-Play Games as Learning Environment

As we say MMORPGs are very popular among students and adult gamers. Some studies have explored the educational potential of MMORPGs. The major fact is that they require a high level of mental participation. More specifically, they are characterized by high interactivity, they involve diverse problem-solving quests and team work that stimulate gamer's motivation. In contributing to education, role playing games challenge the intellect of the participants (Huei-TseHou, 2012).

Role playing game (R.P.G.) can benefit and develop the mental state of the player involved not only in childhood, but also for adult gamers. Role playing games are cooperative, improvisational, structured and free form "interactive stories" (Philips). In an RPG game the gamer illustrates intense social behavior, cooperation with other players and improvisation which leads to the conclusion that role playing games can be used as educational and therapeutical tools. The experience gained through such games, that could establish an educational model for public education in schools[8]. In the previous years has not been given the appropriate attention to RPGs and enhance the learning experience as part of the curriculum. Only recently started to show interest in RPG's as educational tool. RPG's are inherently social skills

developing activity. In general, studies have shown significant benefits in theoretical and applied sciences.

2.5 Storyboarding

Now irrelevant the serious games or RPGs every kind of games a “story to tell”, meaning they have beginning, middle and end of a “story”. At the game creation, they have several team to work one of that teams are the storyboarding creation team. Storyboard either as graphic representation either as a table with rows has frames, the frames represent a piece of the storyline. Storyboard is a very important art of the game because it organizes the whole storyline of the game, more simply it shown as on “paper” how the game starts and ends. Storyboard technique began at the middle of 15th century by Leonardo da Vinci which evolved at 20th century by director Alfred Hitchcock and WaltDisney (Hoffart et al., 2016). The most important think about storyboard is the continuous communication and bonding among development groups. As Van der Lelie said storyboards is the best method for ensuring communication among the development team (Farra et al., 2016). Concerning the educational games which are the main topic of this article, it is imperative the creation of a storyboard. The graphical representation of the game allows the creation teams to control important elements of the game such as the configuration of the individual needs of the learner there desires and the material preferences that they choose to be educated (Arnold, et al., 2013). Summarizing storyboard is one of the basically works to be done for a game creation because it shown as the story and the plot of the game, organize the work to be done by the other teams and keeping them in constant communication.

In the case study of the game, specifically the format of storyboard includes:

a) Checkpoints

In generally here described at which point we are in the level and designers recognize what is happening at this point. Usually represented with words or even pictures.

b) Action

As we understand in this section describe the whole activates and scenario at the checkpoint. More specifically is the quests, cinematics or dialogue with NPCs in the game. The most basic features in the game are the problem solving, dialogue between NPCs that innervate in the story and the progress of the activates (Jeffries 2016) (Farra et al., 2016).

c) Challenges

Here the students call to face and solve parallel actions having the potential to gain more knowledge and bigger reward in the game. Is the student's choice whether to choose to complete the Challenge section or not which means that the game is different for every student. This section is very important because here the students have the opportunity to learn even more things that they need to know about the school matters that they learn.

d) Objective

It is clear here that in this section describe purpose of the level and each checkpoint separately in the table.

2.6 Digital means for Education of History & Mythology

Worlds History and Mythology is a special and unique piece of culture for every county separately, it's identify and characterization the people as peoples and even in some cases makes them proud. They are thousand historical events and myths around the world and for those stories millions of books that recount them and everyone of that book slice different from the other. But what about games, dose that kind of games draw the interest of gamers so that game companies make them? The answer of course is yes, both historical and mythological games are very popular in the community of gamers in all over the world. Specially the Greek mythology with so many gods, battles and plots, many great games have been made. In the present research, the most important of these will be presented (Fig. 2.2, Fig. 2.3 and Table 2.1).

2.6.1 Age of Mythology & Age of Mythology: The Titans

The first one and in my opinion one of the greatest one is the “Age of Mythology” created by Ensemble Studios (2002). Age of Mythology is a real-time strategy game based on history and mythology of Greek, Egyptian and Norse civilizations and one year later even the Atlantean’s with The Titans expansion. In the game, in every clan have to build temples, farmhouses, stables etc. and build an army against other civilization. The think that you can learn from the game basely is the gods from those civilizations and some heroes.

2.6.2 God of War

Speaking for gods we have the “God of War” develop by David Jaffe at Sony’s Santa Monica Studio (2005). This game literally based on Greek mythology around a Spartan warrior Kratos who was deceived by his god Ares and killed his family. Eventually Kratos finding the Pandora’s box killed Ares and become the new God of War. In all storylines at the games timeline expansions the think that we can learn from the game is pretty much the same with the Age of Mythology but simply to a greater extent, meaning here we found all ancient Greek god, we learn about Olympus and we meet many ancient heroes and learn about them and their history.

2.6.3 Godfire: Rise of Prometheus

In the sequel, we have the “Godfire: Rise of Prometheus” powered by Unreal Engine technology. This is a mobile game and it’s an action game with only battles. Basically, not much to learn here but even in that kind of game throw cinematic anyone can learn the great story of Prometheus who defied the gods and save the mankind offering them the power of fire.



Fig. 2.2 Games: a. Age of Mythology(2002), b. God of War(2005) and c. Godfire: Rise of Prometheus (2014)

2.6.4 Disney: Hercules

A game worth of mention is the “Disney: Hercules”. Everyone knows the demy-god Hercules son of Zeus and his labour’s to be god. This was a 2D game based on Disney cartoon story and every level basically is anlabour ending with delighting his uncle Hades. Every kid of that era, learn the story of Hercules without even try simply playing the game because every level is anlabour that need to pass.

2.6.5 Warriors: Legends of Troy

Going to a more resent game, “Warriors: Legends of Troy” a first-person game developed by Koei Canada, Inc based on maybe the most famous and greatest battle in the history, the Trojan War. In the game players unfold the whole story of Troy, which lasted a decade, from cheating of Helen to Menelaus to the win of Greek people against the Trojan tricked by Odysseus. Here except from the basic story of Troy players have the opportunity to take the role of numerous heroes like Achilles, Odysseus, Ajax, Hektor, and Paris and learn more specialized things about those heroes because in the game they are those legend heroes.

2.6.6 Wrath of the Gods

There are many more examples to show but I will refer to one more, “Wrath of the Gods” developed by Luminaria for computer platform. Every game above that was mention created for commercial reasons and for enjoyment of gamers despite all of them are based on mythological and historical events offering offering knowledge to the players. But Wrath of the Gods is different because created exclusively for student to learn and understand better the Greek Mythology. In the game the students can take the place of famous Greek heroes such as Theseus, Jason and Hercules and even to meet the gods of Olympus. Even though it was made for teaching purposes, the game still offer a great enjoyment to the students and the rest gamers that will decide to play it.



Fig. 2.3 Games: a. Disney: Hercules (1997), b. Warriors: Legends of Troy (2011) and c. Wrath of the Gods (1994)

Table 2.1 Game Comparison Table

Titles	Year of Production	2D/3D	Game Engine	Platforms	Type of Game	Single Player/ Multiplayer
Age of Mythology	2002	2D	Genie	Microsoft Windows, OS X	Strategy	Both
God of War	2005	3D	Kinetica	Playstation	Action	Single Player
Godfire: Rise of Prometheus	2014	3D	Unreal Engine	Mobile	Action	Single Player
Disney: Hercules	1997	2D	by THQ	Playstation	Action	Single Player
Warriors: Legends of Troy	2011	3D	by Tecmo Koei	Playstation , Xbox 360	Action	Both
Wrath of the Gods	1994	2D	by Luminaria	Microsoft Windows	Adventure	Single Player

As was mentioned Wrath of the Gods was a game created for helping students to learn Greek mythology but still offer an enjoyment to the student. That is the purpose of that study, a mean for students to learn a history playing a game and enjoy them. In our case for Greek student of first year of high school and the lesson of "Homers Odyssey" for which we will discuss in more detail below.

We mention before that the RPGs draw the interest of young people, that's why choose to build our game based on RPG System.

But what other advantages we can have through historical and mythological games? Cultural awareness, in our case cultural awareness of Greek student. Learning the student their historical heritage, creating a sense of pride for their national culture. The first step for cultural awareness is the self-awareness, meaning that the students have to motivated there self. There are some examples of game using cultural awareness, one of them was "BaFa' BaFa'" a simulation game based on healthcare. BaFa' BaFa' used by several industries for at least a decade irrelevant of healthcare for building cultural awareness except healthcare as a training tool (Ong-Flaherty et al., 2017). Generally, games for cultural awareness used mostly from business and military such as training programs and simulations, but it also used for teaching foreign language. The knowledge of foreign cultural help students to raise their interest for the language through the cross-cultural awareness (Xu, 2016). Sadly, there are very least games about cultural awareness but it is proven that this kind of training games are very efficiently in several industries, with tow advantage, that offering very fun to the users and of course the low cost of materials and construction of the game.

2.7 Raising Cultural Awareness of Students Through RPG EduGames for Greek Mythology

Greek mythology has captivated the imaginations of people worldwide for centuries, and its rich tapestry of gods, heroes, and monsters continues to influence literature, art, and popular culture. Integrating Greek mythology into educational contexts presents a unique opportunity to not only engage students but also foster cultural awareness and understanding. This literature review explores the potential of using

Role-Playing Game (RPG) educational games as a means to raise cultural awareness among students through the lens of Greek mythology.

Educational Role of Greek Mythology:

Greek mythology offers a window into the cultural heritage of Greece and the ancient Mediterranean world. Through the study of myths, students can gain insights into ancient beliefs, values, and societal norms. Several scholars have highlighted the educational significance of Greek mythology in promoting cultural awareness (Lefkowitz, 2003; Clay, 2006).

Role of RPG EduGames:

Role-Playing Games (RPGs) are interactive and immersive storytelling experiences that allow players to assume roles and make decisions that impact the narrative. When used in an educational context, RPGs can serve as a dynamic tool for exploring complex topics such as Greek mythology (Kapp, 2012).

Advantages of RPG EduGames for Greek Mythology:

a. Engagement and Immersion: RPG EduGames offer a highly engaging and immersive learning experience. By assuming the roles of mythological characters, students become active participants in the stories, increasing their emotional involvement (Aldrich, 2005).

b. Critical Thinking and Decision-Making: RPGs require players to make decisions and solve problems within the context of the narrative. This encourages critical thinking and problem-solving skills, which can be applied to understanding the nuances of Greek mythology (Gee, 2003).

c. Empathy and Perspective-Taking: Immersing students in the roles of mythological characters allows them to empathize with these characters' experiences and perspectives. This promotes a deeper understanding of cultural context and values (Deterding et al., 2011).

d. Interactivity: RPG EduGames provide a platform for interactive learning, enabling students to explore Greek mythology actively. They can engage in dialogues, quests, and challenges that mirror the mythological world (Michael & Chen, 2006).

Challenges and Considerations:

- a. **Historical Accuracy:** While RPG EduGames offer creative freedom, ensuring historical accuracy and faithfulness to Greek mythology is crucial to maintain cultural authenticity (Buxton, 2004).
- b. **Diversity and Representation:** It's important to consider diverse perspectives and representations within Greek mythology, acknowledging that there are multiple versions of myths and interpretations (Segal, 2004).
- c. **Accessibility:** Ensuring that RPG EduGames are accessible to a wide range of students, including those with varying learning abilities and backgrounds, is essential for achieving inclusive cultural awareness (Connolly et al., 2012).

Examples of RPG EduGames for Greek Mythology:

- a. **"Assassin's Creed Odyssey":** This video game incorporates elements of Greek mythology into its historical narrative, allowing players to explore ancient Greece and interact with mythological figures.
- b. **"The Argonauts":** An educational RPG that immerses players in the epic quest of Jason and the Argonauts, introducing them to various Greek myths and challenges.

RPG EduGames present a promising avenue for raising cultural awareness among students through Greek mythology. By actively engaging students in immersive and interactive experiences, these games have the potential to foster a deeper understanding of the cultural, historical, and moral dimensions of Greek mythology. However, careful consideration of accuracy, diversity, and accessibility is essential to ensure that these games effectively promote cultural awareness and sensitivity.

CHAPTER 3
Unreal Engine 4 Description

3.1 Creation of Unreal Engine

Unreal Engine, developed by Epic Games, has a rich history that dates back to its origins in the late 1990s. Tim Sweeney, the founder of Epic Games, spearheaded the development of the engine. The engine's journey from its initial iterations to the highly sophisticated Unreal Engine 4 illustrates the evolution of game engines as a whole. Unreal Engine has consistently pushed the boundaries of real-time 3D graphics and interactive experiences. It has evolved from a simple rendering engine into a comprehensive ecosystem encompassing advanced physics simulations, rendering technologies, animation tools, and scripting systems (Schell, 2019). Each iteration has introduced new features and improvements, solidifying Unreal Engine's reputation as a cutting-edge game development platform.

3.2 Uses of Unreal Engine

Unreal Engine's versatility extends well beyond its original purpose as a game development engine. It has found applications in various domains:

- **Game Development:** Unreal Engine has been instrumental in the creation of numerous high-profile video games, including the immensely popular Fortnite and Gears of War franchises (Epic Games, n.d.).
- **Virtual Production:** The engine has significantly impacted the film industry through virtual production techniques. Filmmakers now use Unreal Engine to visualize and shoot scenes in real time, revolutionizing traditional filmmaking processes (Grubert et al., 2020).
- **Architectural Visualization:** Unreal Engine has become a preferred tool for architectural visualization. Architects and designers utilize its capabilities to craft immersive, real-time 3D models and walkthroughs, providing clients with realistic previews of projects (Becker & Feligiotti, 2019).
- **Training Simulations:** Industries like aviation and healthcare employ Unreal Engine to develop training simulations. These simulations offer realistic and interactive learning experiences, improving skills and decision-making among trainees (Hannah, 2018).
- **Education:** Unreal Engine has also made inroads into educational settings. It serves as a valuable tool for teaching game development, 3D modeling, and

interactive design, providing students with hands-on experience (Morris, 2016).

3.3 Advantages of Unreal Engine

Unreal Engine boasts several distinct advantages:

- **High-Quality Graphics:** Unreal Engine is renowned for its capacity to deliver high-quality graphics and visual effects. Its rendering capabilities, including physically based rendering (PBR) and ray tracing, empower developers to create visually stunning and realistic environments (Lander, 2017).
- **Blueprint Visual Scripting:** Unreal Engine's Blueprint visual scripting system has democratized game development. Designers and non-programmers can create complex gameplay logic and interactivity without extensive coding (Phipps, 2015).
- **Cross-Platform Development:** Unreal Engine supports a wide range of platforms, from PCs and consoles to mobile devices and virtual reality (VR) systems. This versatility enables developers to reach diverse audiences (Brown, 2015).
- **Community and Resources:** Unreal Engine benefits from an active and supportive user community. Developers have access to extensive documentation, tutorials, and forums, making it easier to learn, troubleshoot, and share knowledge (Kromin, 2020).

3.4 Disadvantages of Unreal Engine

While Unreal Engine offers numerous advantages, it also presents certain challenges:

- **Complexity:** Unreal Engine's vast feature set and sophisticated tools can be overwhelming for newcomers. The engine's complexity results in a steep learning curve, especially for those new to game development (Vennix & Stilma, 2019).
- **Resource Intensive:** Developing high-quality content with Unreal Engine often requires substantial computational resources. This resource intensity can be a

challenge for smaller development teams or indie developers with limited hardware (Epic Games, n.d.).

- Cost: While Unreal Engine is free to use for non-commercial purposes, it employs a royalty-based model for commercial products. This means that developers may incur royalties on revenue generated from their projects, which can affect profitability (Unreal Engine, n.d.).

3.5 An Overview of the Unreal Engine 4's User Interface A Look at the Tab System

The default layout of the Unreal Editor. The Unreal Editor deploys a tab-based system to help organize the Editor windows. This has a large benefit in comparison to other methods because it allows the user to adjust the layout in a manner that best suits individual preferences. The default arrangement of the tabs should be the same as shown in the following figure.

Looking at the figure above, you can see each section identified as follows:

- 1—Modes panel
- 2—Content browser
- 3—Toolbar
- 4—Viewport
- 5—World outliner
- 6—Details panel

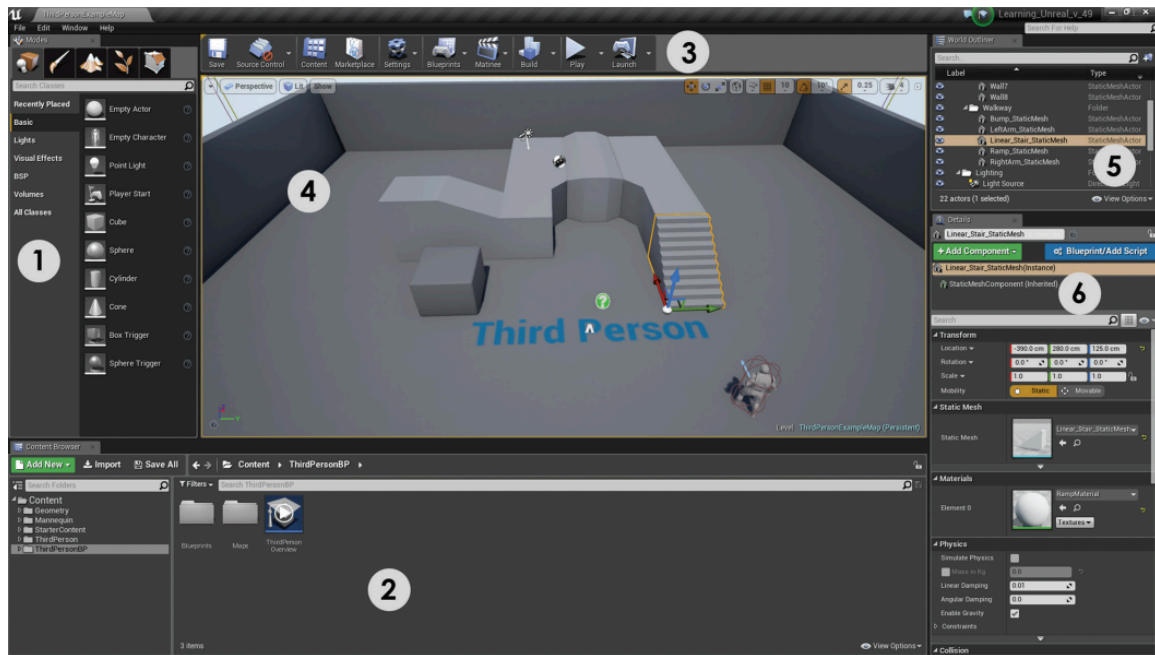


Fig. 3.1 The Editor of Unreal Engine

It's worth noting that you can detach and move any tab to another section as per your preferences, customizing the Editor to suit your workflow. Additionally, you may observe that the toolbar and viewport 1 don't display tabs initially. To reveal these tabs, click the triangle located in the upper left corner.

The panels that are open when you first launch Unreal:

Modes Panel: This panel is home to several indispensable features that you'll frequently use. At the top of this panel, you'll find five icons representing Place, Paint, Landscape, Foliage, and Geometry Editing modes. You can switch between these modes either by pressing Shift + 1–5 or by clicking on your desired mode. Each mode offers a range of features, and selecting a mode alters the content displayed in the lower part of the panel.

Content Browser: The Content Browser houses a folder structure mirroring the organization of your current project. Unreal automatically creates several folders to help you organize your project, including Geometry, Mannequin, StarterContent,

ThirdPerson, and ThirdPersonBP. Each folder contains various subfolders and content items. It's important to note that Unreal enforces a naming convention that doesn't allow spaces. For example, "StarterContent" is a single word. If you attempt to name a new item with spaces, you'll encounter a red warning indicating the naming error. Instead, Unreal recommends combining CamelCase (capitalizing the first letter of each word) with an underscore to separate words, such as "Learning_Unreal."

Toolbar: The Toolbar serves as a convenient access point for a concise list of frequently used tools during the level-building process. We will provide more comprehensive explanations of each tool as we progress through the book.

CHAPTER 4
The Case of Odysseus journey - Role-Playing Game

4.1 Analysis

Odysseus Journey is a classic Role-Playing Game in which students first year of high school will learn the Homers Odyssey with an interactive game. Game allow to students to explore the whole world with no time limit and as we said due to RPG system students can actually “walk” the same path with Odysseus. More specific students have the control of a virtual character (Odysseus or Telemachus) depending the level he plays and in the world calls to face the quests of that level (find the riddles, and complete missions like the story of Odysseus) taking by the NPCs and at the end of the quest reward them. Quest is actually pretty much the “Action” of the game. The students can even talk with some NPCs irrelevant from the levels quests and learn and do more thinks that they need to complete the level. That is called “Challenge” in the game and students except that they have more reward than they had without Challenges they can learn even more information’s of Odysseus story and of general history. For example, in 08 level at the begin after cinematic Odysseus stand next of the altar and the sacrifice to the dead, the student can interrupt with the altar and learn more information about the meaning of that ritual and the purpose. It is understandable that the game is a bit different for every student yes, they all have to pass some specific quest for the level but to explore the whole world and do many other thinks in the game is a free choice of the students.

As we describe before in the storyboard is an integral part of creation a game because organize and keep the teams in constant communication and explain us the whole story of the game. Our storyboard we build it with checkpoint, challenge and objective section. A sample of that work represent at the table below.

Table 4.1.Example game flow (Sequence diagram of Check point 01)

Check point	Action	Challenge	Objective	Hints	Rewarding
01	Odysseus begins at the quay, next, to him finds the sacrifice to the dead	Selection of the altar for the		Textual Hint: Text	

	<p>who had to do, i.e. to open a pit and pour in the blood of the two lambs, milk, wine, honey and finally the water. At the bottom of the screen there is a message about what to do at this level (find the prophet Teiresias). In order to do so, he has to talk with relatives and friends to guide him to Teiresia. Inside the cave, he finds a statue of Hades, who welcomes anyone entering the world of spirits.</p>	<p>appearance of the message explaining the meaning of the altar and sacrifice.</p>		<p>that gives information about clay pot ingredients</p>	
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4.2 Design and Implementation

The case study of Odyssey has created by one of the greatest game engine, the Unreal Engine by Epic Games. Game engine is a program that used to create usually games. In case of Unreal Engine, you can creating anything from simple 2D games to a very complex 3D games or even a whole movie.

In case study of Odyssey the whole game based in the main character (Odysseus) and one act (rhapsody) the Prophecy of Tiresias. In the current study a Main World Map was created based in blueprints. Blueprints it's a coding method based in C++ programming. Our character begins his adventure at the entrance of the kingdom of Hades after watching ActCinematic, a video that foreshadows our character about how he got here and what he needs to accomplish. The central image of our character at the top left shows the name of our character (we have chosen it at the start of the game) with its vital energy (HP) and his Fighting Energy (MP) as well as the level

(level) that our character finds. At the center top of our screen we have the area where our hero can be found. At the top right we have the minimap, a floor plan map with live broadcast of where you find our character in which important information about the missions that will follow are displayed. Finally, at the central bottom of our screen there are the available skills of our character and the experience bar where all the points are collected for the character's level progression. Through the guide we will discover a plethora of classic options for RPG systems such as the panel of missions to save the game etc.

It is a fairly complex system of game coding like any game in its category with different encodings concerning our main map such as the start of the first mission through a box trigger but also encodings that are based on the whole system as our central character how he can walk to perform his forces, how he loses life that he earns points of experience but even what happens if he dies. Of course, there would be no shortage of the "EnemySystem" enemy system with the command execution tree, making AI (Artificial Intelligent) characters about how they will move through the map how and when they should be attacked and of course how to be destroyed by our central character. Finally, there are the NPCs (Non Player Characters) which play a role in our script are guides for the central character on how to reach his final goal by giving him missions and directing him to the end of the Act.

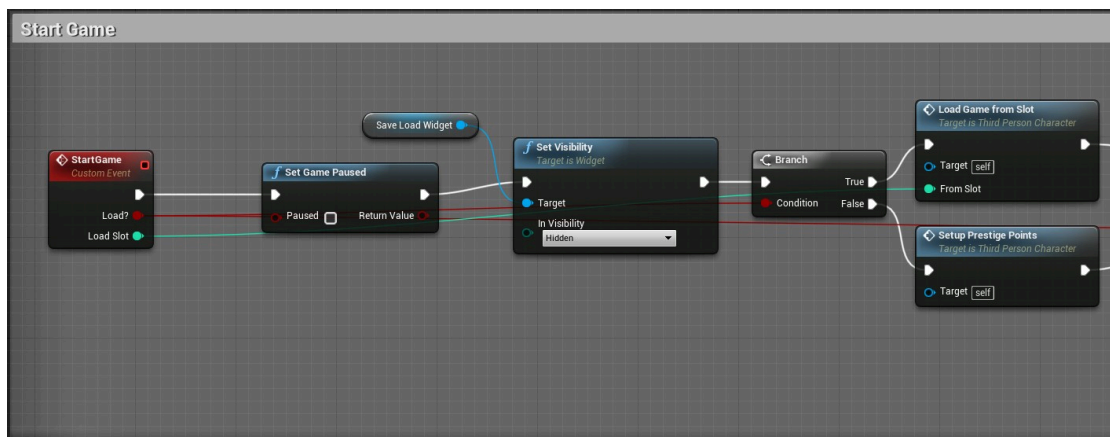
Of course all this could not be highlighted and presented without the high-level graphics offered by the Unreal platform. At this point, I would like to mention that the graphics as quantity and quality in this particular game are limited because their operation needs high knowledge of construction and time so the greater volume of graphics of the game was taken through the ready-made graphics of the platform but also graphics that I downloaded from a forum on the internet with excellent conventional graphics that were not even available for sale and I had to build them myself through the AutoCade Auto Desk, Photoshop of Fuse, and Mixamo of Adobe.

With the use of the AutoCad program, the boat was created at the beginning of the game, with Photoshop the static graphics such as the images for the forces of the character, the bar of experience, the image of the tables such as the table of missions, etc. With Fuse, all the necessary characters of the game were created as well as our

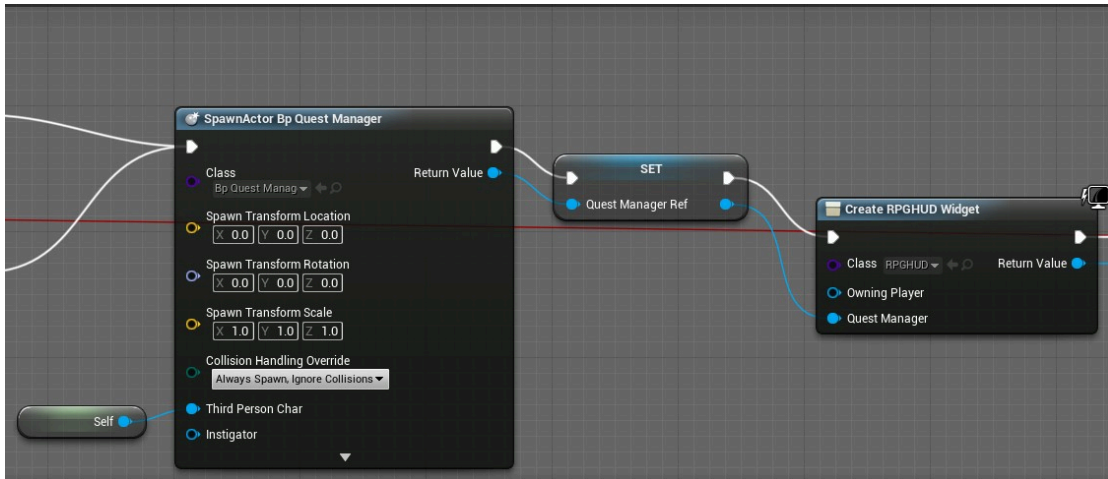
main character and finally with Mixamo, the characters created in the program were introduced to add the movement to them.

Example of executing Blueprint code through the character's code:

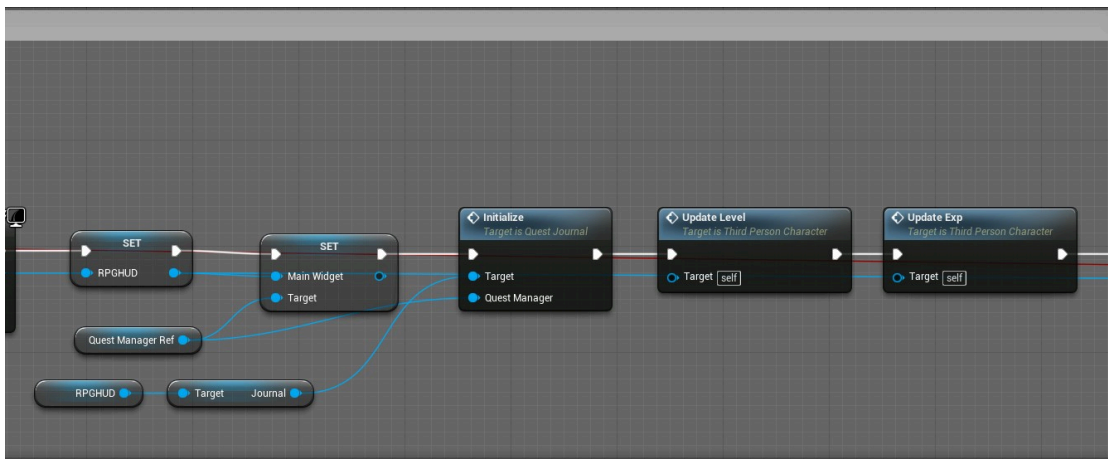
- Start of play
- Pause the game
- Appearance of the Game Upload / Storage window
- Selection (y / n)
- Upload a game from the selection point, determine validity points

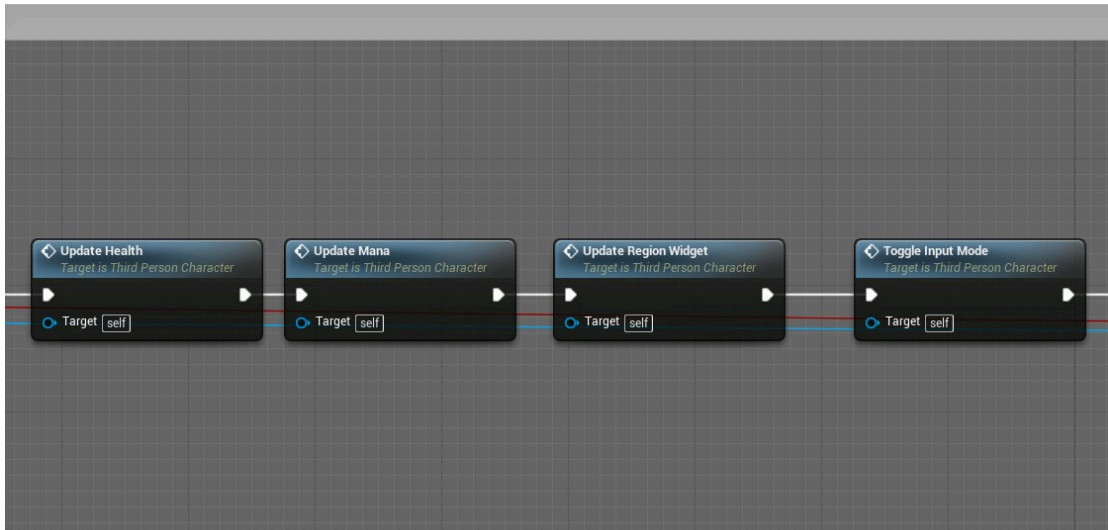


- Connection of the main character with the system of the game structure (save saved files, shipments, etc)
- Reference to the above system
- Creating the central image of the character (level, skills, prestige, HP / MPpoints, minimap)

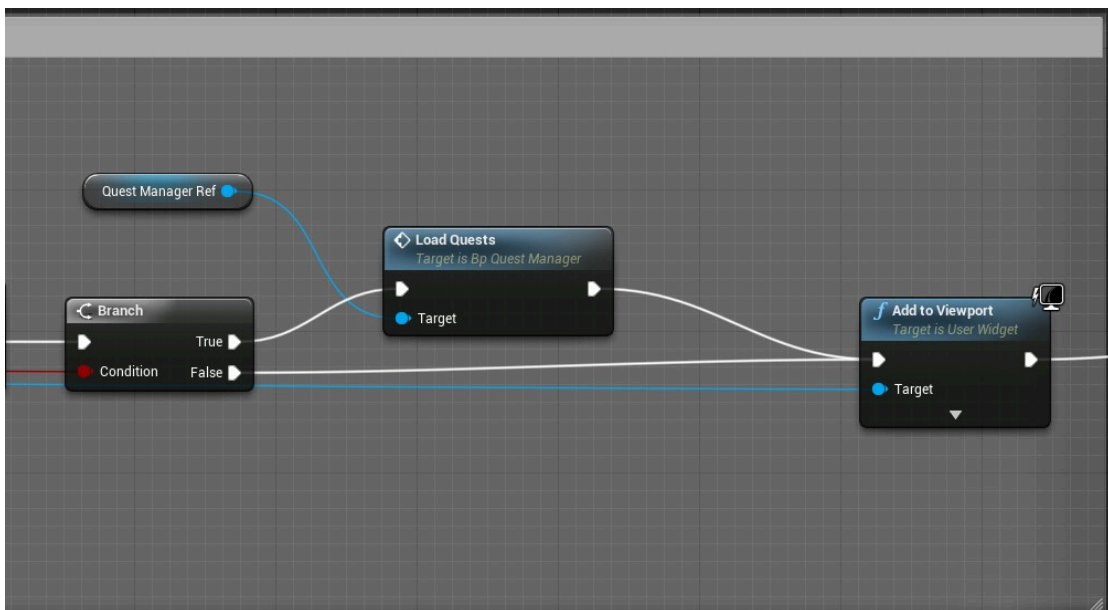


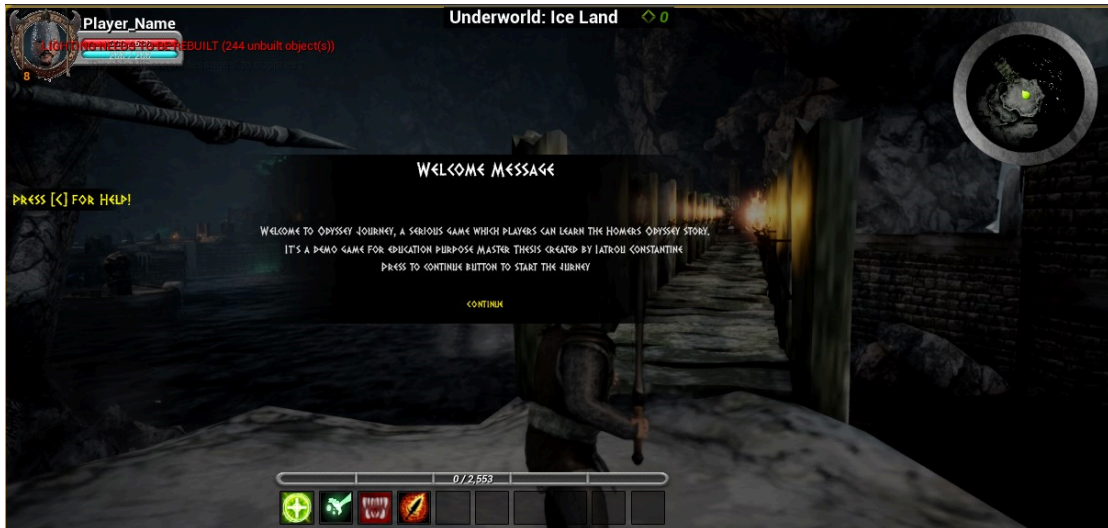
- Connection of our main image with the operating system of the game
- Connect to the game's mission menu
- Information about the level, experience, life, energy and area where you find the character
- Reference to sub-program in and this in functionality in our main character with which our character has the ability to display and disappear the mouse pointer





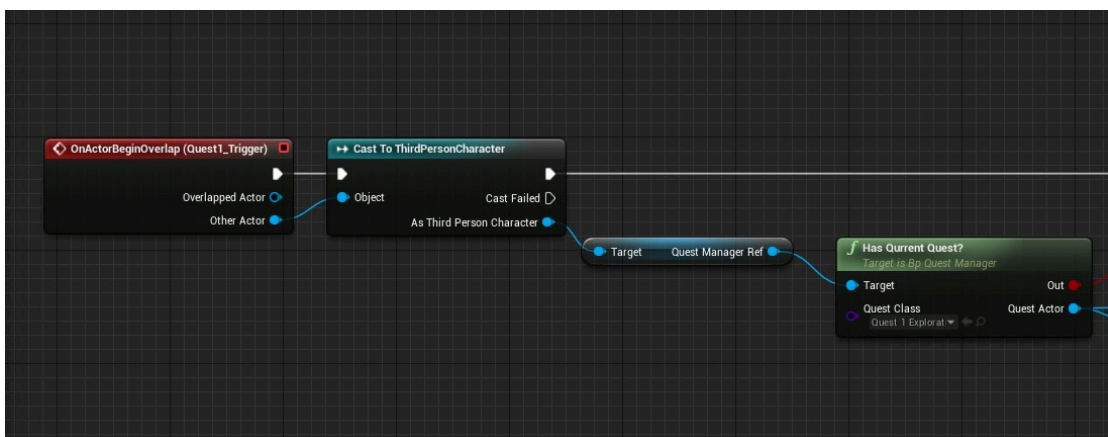
- Reference to sub-program of the central structure of the game for sending the load
- Command all of the above to appear on the main character screen

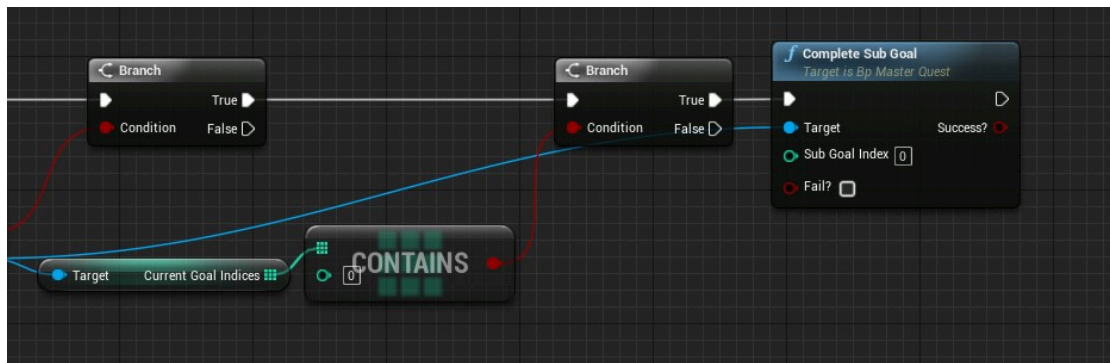




Example of performing a mission:

- When the character activates the triggerbox with the name "QuestTrigger" to run on the main character
- Referring to the central structure of the game
- In the category of all missions
- Including all items of the mission
- If it is correct and our character has already stored the mission or completed or to be completed then do not perform anything
- If it is wrong and does not have it but can receive the mission then add to the character a new mission called "Quest1 Exploration"





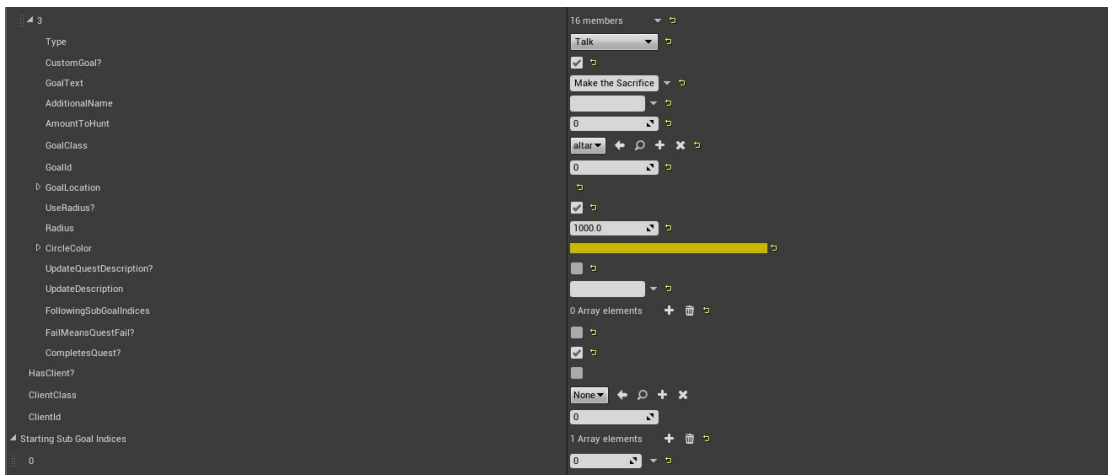
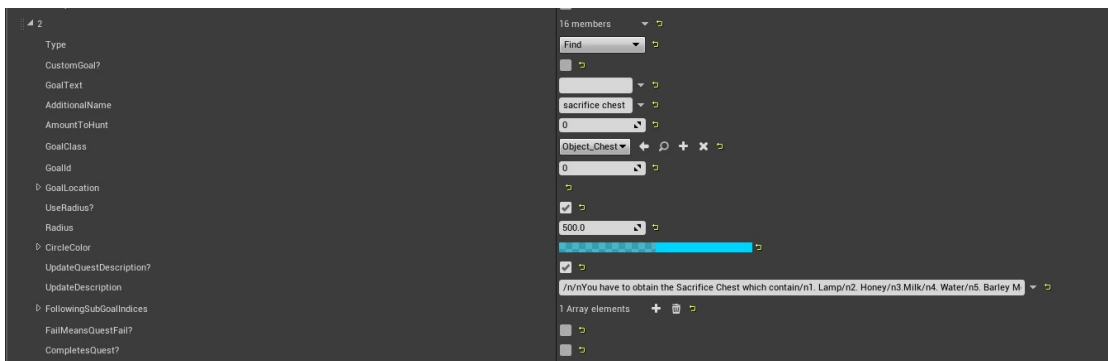
This connects us to the mission called "Quest1 Exploration" so that we can start our mission whose steps are:

- Quest1 Exploration is the name of the mission to the game's system)
- The category of the mission (Main, Side, orEvent)
- The text that appears through the character's dispatches tab
- In which region you are performing the mission
- The experience that the character will gain from this mission
- The prestige that the character will gain from this mission
- The epithetical level of character to undertake the mission
- Sub Goals are the goals that the character must perform to complete the mission (in our example we have 4)
- In the Type option you choose what kind of test the character will do by choosing between Custom, Hunt, Find and Talk (in our example we have the Option Custom because they put him to do something more specialized than the standard options)
- The Custom Goal option? It's about whether we want to add our own text to the Short Description on the character's main screen
- If in custom goal; We choose yes then our text that will appear is goal text
- If in the Custom Goal option we chose no then on the central screen would appear the category of subshipment (Type) along with what we add to the option of Additional Name (eg Type =Hunt and Addition Name = 9 Dragons on our main screen will show us the subpost Hunt 9 Dragons)

- In type=hunt we should also specify the number that we define through AmountToHunt (hunt only)
- If we are inclined to give the location that the character should go we do it through hasLocation; (selected) and the geographical location (X, Y, Z) of the game map in Location (the column is displayed in the minmap)
- The UseRadius option? It is about whether we want to create in the minimap a stop that cajoles a big perioch and noise-riding location along with the Radiusdiladis the radius that we want to good on the map along with the color we want to define
- Update Quest Description? It's the option for whether we want to add additional information to the center tab of the character's mission category. If so, under the text in the original Description, the text that we will put in the Update Description will be added.
- If there are any panos from a sub-shipments then in the following subgoal Indices option we add the corresponding number based on the composition we want for the shipment and we connect it accordingly. In our example we want to go from sub-mission 0 (which is always the central one) to the sub-mission 1 so 0 to 1 (if we wanted to go to sub-mission 2 I would choose 0 to 2)

The screenshot displays a quest configuration window with a sidebar on the left and a main configuration area on the right. The sidebar lists various quest properties, and the main area shows the values for these properties.

Property	Value
Name	Welcome to Underworld
Category	Main Quest
Description	Welcome Odysseus in the land of the dead, the purpose of your coming here is to find the prophet Tiresias and
Region	Underworld, Ice Land
CompletionReward	1250 Experience, 180 PrestigePoints, 0 SuggestedLevel, 0.0 Difficulty
SubGoals	<ul style="list-style-type: none"> 0: Type: CustomGoal?, GoalText: Reach the end of the bridge to find the Ancient Stone!, AmountToHunt: 0, GoalClass: None, GoalID: 0, hasLocation?: checked, Location: X: 35230.0, Y: 35340.0, Z: 1070.0, Radius: 500.0, UpdateQuestDescription?: checked, UpdateDescription: /r/Near the bridge there is the Ancient Stone to tell you what you have to do to enter the land of the dead. 1: (Index)
FollowingSubGoalIndices	0
FailMeansQuestFail?	checked
CompletesQuest?	checked



Based on what we mentioned above and the example of the mission we analyze, we see what is the procedure followed by the system to complete the shipment. That is, after his system is activated, he displays a moment the map that he has to go to find the "AncientStone" from there he learns that he has to make a sacrifice in order to enter the kingdom of the dead and he turns back to the ship to take the unswerving materials and from there the map to impersonate the area where the bomb is found in order to make the sacrifice and after he executes it and the last sub-mission and completing his central mission will be received through the Book of the Dead which

was on the altar where he made the sacrifice and the key to his entry into the Kingdom of Hades.

CHAPTER 5
Case Study – Level Underworld

5.1 Odyssey, Rhapsody Α:Odysseus looks for Tiresias

*Then I addressed him, saying: 'Teiresias, thou
art verily a seer, as they declare,
that dwell in Thebes the well-built city; thou
always hast sure presage, while others guess.
Now I am come to thee, O Theban seer,
as one that is in sorest need; so hear
and grant the boon which I shall supplicate.
Dead though thou art, for even in the realms
of death, O Theban, hath the highest Jove
vouchsafed that thou shouldst still retain thy mind
and sight. And now, O Theban, hear my prayer;
for I have come to seek thy counsel. Hear!
I am with all the ills which I have borne
weary, for on his arrival after long delay,
a kinsman's house is ever welcome. But
I have not one boon of my crew, or ship,
or cargo, brought within the ship, through which
the men are perished, all my friends in Troy,
and I have wandered home again. And now
I am in evil plight. The suitors strive
to win the love of my chaste wife, and waste
my substance, and within my halls have I
consumed many cattle, sheep and bristly swine,
and drank from out my cellars. Much of gold
and goodly raiment have I given to them,
and ever with fair words would I appease
them, and still add thereto, if haply they
would cease from wasting me. But now have I
conceived an evil purpose in my mind,
for that I find no respite from the deeds*

*that they perform. And thou, I see, dost not
in any wise regard it, nor give ear
unto their ways. Come therefore, O divine
Teiresias, thou seer of far renown,
give ear, and hearken to me, and accept
my words. Come hither by the counsel of the gods
and tell me of the voyage that I make,
and of the toils that lie before me; for
I cannot think to make return from them.
Wherein shall I go upon the teeming earth?
Say where Poseidon doth not hinder me
from making voyage, for I have no mind
to please him well, but would to all mankind
be a mocker and a laughing-stock.'*

*"Then the spirit
of Teiresias made answer: 'Thou dost ask
a difficult thing, and I would fain not speak
or tell thee all, since thou art certain to come
to thy returning, though it be with sore
adventure, if thou wilt but restrain thyself
and the company with thee. And I will make
the matter plain. When thou shalt meet a band
of men, if they be strangers, who with bread
and full flesh shall offer thee thy need, forbear
thyself and thy companions to destroy
the herd of kine that comes not to thy mind,
for they belong to the bright Sun who looks
from heaven upon the fruitful earth and all
the tribes of men. When thou shalt leave them, then
draw near the teeming isle of Thrinakia,
and there are herds of kine and flocks of sheep*

*belonging to the bright Sun, who hears and sees
all things. If thou wilt spare them and refrain
from wrath, haply ye may reach Ithaca,
though with sore trouble, for if thou afflictest
his flocks, I see the utter ruin of thy ship
and of thy comrades, but if thou leavest
them untouched, then shall ye come to Ithaca,
though late, with loss of all thy company.
And if thou offerest violence, or doest harm
to those flocks, I see the coming of destruction
on thy ship and crew, and if thou comest
thyself unharmed, thou shalt come late and badly.
So shall ye meet with grievous ills at home,
all wrongs and sorrows which to mortals come.
Thus shall it be with thee. Lo, even now,
mine eyes are darkening round me, and the earth
so it seems, O king, is rising in revolt.
Farewell. Come hither, I will answer thee,
and tell thee plainly, and thou canst not choose
but hearken; and it is not for thy gain
to draw back from my word.'*

*"As he thus spake,
the ghost of Teiresias vanished through
the void of air, and I abode in place,
till my exceeding grief was overpast."*

*Homer. Translated by A. T. Murray, Loeb Classical Library, Harvard University
Press, 1919.*

The above rhapsody is the scenario-story telling of the case study that was used in the current Thesis and below the storyboard of Level 08 "Teiresias" (Table 5.1).

Table 5.1. Storyboard of Level 08 “Teiresias”

		learning goals		Motivational Strategies				learning strategies		
Checkpoint	Scenario – Story telling	new skills and/or knowledge acquired	Challenges	Hints	Rewarding	Feedback	clear goals	Newfound skills and knowledge	lower level skills required before progressing to harder challenges	Check point of level succeeding without learning
00	Cinematic: Odysseus and his companions are heading with their ship at the entrance to the underworld.	-	-	-	-	Introduction to the levels storyline	-	-	-	-

	Odysseus and his companions are anxious about what awaits them there. The cinematic finishes when the ship is close to reaching the "quay" of the underworld.									
01	Odysseus begins at the waterfront, and on the screen, there is a welcome message and instructions for what he needs to do on this level (to find the prophet	Yes	Selection of the altar for the appearance of the message explaining the meaning of the altar and sacrifice.	Textual Hint: Text that gives information about sacrifice	Collection of points: 200	Learning the meaning of the sacrifice at the ancient Greece	Yes	The knowledge to come in the land of the dead is taken from previous level at the Circes island	No	No

	Tiresias). To enter the underworld, he must make the necessary sacrifice at the altar. He finds the statue of Hades, which welcomes anyone entering the realm of spirits.		Selection of Hades statue							
02	Further down there is Antipheus, the companion that was eaten by Cyclops Polyphemos. Antipheus warn him to take the oracle from	Yes	Odysseus have to find lure of Antipheus	Odysseus have to find lure of Antipheus and defeat skeletal warriors	Collection of points: 300	Learning how to pass the first area in the land of the dead "The Ice Land".	Yes	Knowledge about the fate of Antifus	No	No

	Teiresia as fast as he can and to leave because the spirits of the dead will want to keep him there. He asks him to find his favorite musical instrument that lost it as he came to the underworld. After he brought it to him, he informed Odysseus that Teiresia was in the depth of the land of the dead, after the two hanging									
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	bridges with view the river of Lethe. Warn him about the Door Keeper									
03	The Door Keeper inform Odysseus that he must obtain the key to the Spirit Land by defeating the Ice Beast that guard it.	No	Defeat the elit monter	The key reveal after Odysseus defeat the Ice Monster, its near by	Collection of points: 450	After the Ice Monster is dead and obtain the key return to the Door Keeper	Yes	No	Yes	Yes
04	Odysseus going inside and meets Elpenor the companion that originally thought he was afraid to come to the underworld and	Yes	Kill the near by monsters for him	Giving information of how Elpenor died.	Collection of points: 250	Speacking with Elpenor and accept to bury his body.	Yes	Knowledge about the fate of Elpenor	Yes	No

stayed on the island of Circe. Odysseus, with tears in his eyes, asked Elpenor how he was here after having left him alive on the island of Circe. In his dialogue with Elpenor, he finds that on his way to the boat from Kirk's palace he slid off a tall rock and was killed. At that time, Elpenor pleaded with Odysseus when										
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	they left the underworld, crossed the island of Circe, made him a proper funeral as appropriate to the dead. Odysseus gave his word and went further.									
05	Walking in the depths of the cave Odysseus meets a pleasant physiognomy, is the spirit of his mother. After making a dialogue about how he was there, he informed	Yes	Find the ring of his mother	Giving information of how Anticlea died and how is Odysseus family	Collection of points: 150	Speak with his mother spirit	Yes	Learn about the fate of his family	Yes	No

	him that Penelope is still waiting for him in Ithaca and that his son Telemachos has grown up.									
06	Leaving his mother, Odysseus moves to the deep cave gallery and finds the two hanging bridges as Adiphos had told him and the river Lethis below. Getting out of the gallery comes a quick cinematic with the round area	No	Odysseus have to kill all monsters in the cave so he can pass	Action Hint: Odysseus must kill all monster	Collection of points: 400	From cinematic find out where it this unknow spirit that Antifus told him	Yes	No	Yes	Yes

	pointing to a spirit waiting on the edge of the slope.									
07	Odysseus directs to the unknown spirit and asks if he knows where to find Tiresias. The spirit said he would direct him on the right path for him, as long as he finds and delivers a letter to his wife who was also that spirit in the underworld.	No	Find the letter from the unknown spirit to delivered to his wife	Odysseus must deliver the letter to unknown wife spirit	Collection of points: 200	Find the unknown spirit wife to learn the location of Tiresias	Yes	No	Yes	Yes
08	Turning back to the cave, Odysseus finds his wife	No	By delivering the letter return	Textual Hint: Spirit Thanks Odysseus	Collection of points: 150	By delivering the letter the unknown		No	Yes	Yes

	<p>somewhere in the center of the cave along with other dead people. He pleases him for his kindness and Odysseus returns to Checkpoint 06 again.</p>		to the unknown spirit			spirit tells Odysseus the location of Tiresias				
09	<p>Turning to Checkpoint 07, the unknown spirit pleases Odysseus and tells him exactly where to find Tiresias.</p>	Yes	No	Thanking messege from unknown spirit	Collection of points: 200	By helping unknown spirit now Odysseus know the location of Tiresias	Yes	Knowledge of Tiresias location	Yes	No
10	<p>As Odysseus flees from the unknown spirit, he arrives at</p>	No	Defeat the Spirit Monster	The key for the next realm will	Collection of points: 300	After the Spirit Monster is dead and	Yes	No	Yes	Yes

	two hanging bridges. There, he encounters another Elite Monster, which is an obstacle on his way to reach Tiresias.			appear after defeat the Spirit Monster		obtain the key find the Door Keeper				
11	Odysseus delivers the key to the next kingdom, Door Keeper and informs him that there is an old friend and companion of his at the beginning of the cave who would be delighted to see him. There,	Yes	Deliver the key to the Door Keeper	Speaking with the Door Keeper allowing him to pass and inform him about old companions inside. The first one is Achilles who is warn him	Collection of points: 150	After delivered the key learn that old companions are inside and they can help him to reach Tiresias. Achilles inform Odysseus	Yes	Find old companions Achilles and Menelaus learning about them and help inform him how to pass the guardian	Yes	No

	he meets Achilles, who warns him about the dangers lying between Odysseus and his goal. Achilles sends him to speak with Menelaus, who will help him get past Hades' guardian.			that is very difficult toCollection of points: 150 go to Tiresias because Poseidon warn Hades' and he put the most fearless guardian		about Hades' guardian and send him to find Menelaus who knows how to defeat him				
12	Finding Menelaus, Odysseus learns that to reach Tiresias, he needs to obtain the "Mystical Blade of	Yes	Kill Cerberus obtain the "Mystical Blade of Spirits"	Inform where is Cerberus to obtain the "Mystical	Collection of points: 250	Cerberus guard the only weapon can deffeat his guardian	Yes	Learning about Menelaus and Cerberus the three head dog of Hades'	Yes	No

	Spirits". The blade is guarded by Hades' pet, the three-headed monster Cerberus.			Blade of Spirits."						
13	After acquiring the "Mystical Blade of Spirits," Odysseus attacks the guardian with the goal of defeating him and finding Tiresias.	Yes	Kill the guardian of Hades', The Hecatonchires "Briareus"	The guardian is in the top of the hill.	Collection of points: 550	Learning the location of the guardian after obtain the "Mystical Blade of Spirits"	Yes	Learning about The Hecatonchires "Briareus" and whom put him there	Yes	No
14	After defeating the guardian, Odysseus returns to Menelaus to update him and gather further information	No	Find the friendly spirit	The position of friendly spirit appear in the map	Collection of points: 150	Menelaus tell more information about the guardian and send you to	Yes	No	Yes	Yes

	about the final gate where Tiresias is located. Menelaus sends him to a friendly spirit who is an assistant to Tiresias in the underworld.					find the friendly spirit				
15	Upon reaching the friendly spirit, he tells Odysseus that he would gladly let him pass through the gate, but he fears punishment from Hades' guardian. Odysseus informs the friendly spirit that	No	Find the mask of the Guardian	The location of the mask appear in the map	Collection of points: 150	The mask is the prof the Odysseus defeat the guardian	Yes	No	Yes	yes

	he has killed the guardian. To convince the spirit, he asks Odysseus to bring him the guardian's mask as proof of his brave deed.									
16	Odysseus returns and finds the mask from the guardian with the intention of taking it as proof to the friendly spirit. After presenting it, the spirit praises him for this remarkable	Yes	Present the mask to the spirit	Presenting the mask to the spirit the gate to the chamber will open	Collection of points: 250	Opening the chambers gate Odysseus can find and take Tiresias prophecy	Yes	Learning about the meaning of prophecy's and about the most know sanctuary of them, the Oracle of Delphi	Yes	No

	achievement and opens the gate to Tiresias' chamber.									
17	Odysseus finds Tiresia. In the dialogue, they are telling him he will still meet on his way to the homeland	Yes	Talking with Tiresia	Gives him information about his journey	Collection of points: 250	Learning about his mistakes, the way back home and what he will sacrifice for that.	yes	Learn about his hubris against the Gods and that Poseidon stand against to him and Ithaca	Yes	No
18	Odysseus, with great weight in his soul and with sadness, takes the way back to the ship that his companions have been waiting for.	Yes	Return to the ship	Odysseus is very long in the land of the dead. He must hurry to return to the ship.	Collection of points: 150	With heavy hart Odysseus return to his ship and companions	Yes	Learn about his fate and a glimpse of his journey	Yes	No

Arriving at the boat show a cinematic in which Odysseus speaks to his comrades and tells them to leave quickly and set a course for the island of Circe.										
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Furthermore, screenshots of the virtual environment of the application from the implementation of the game (Fig. 5.1 – Fig. 5.10)



Fig. 5.1 Virtual environment of the application from the implementation of the game



Fig. 5.2 Virtual environment of the application from the implementation of the game



Fig. 5.3 Virtual environment of the application from the implementation of the game

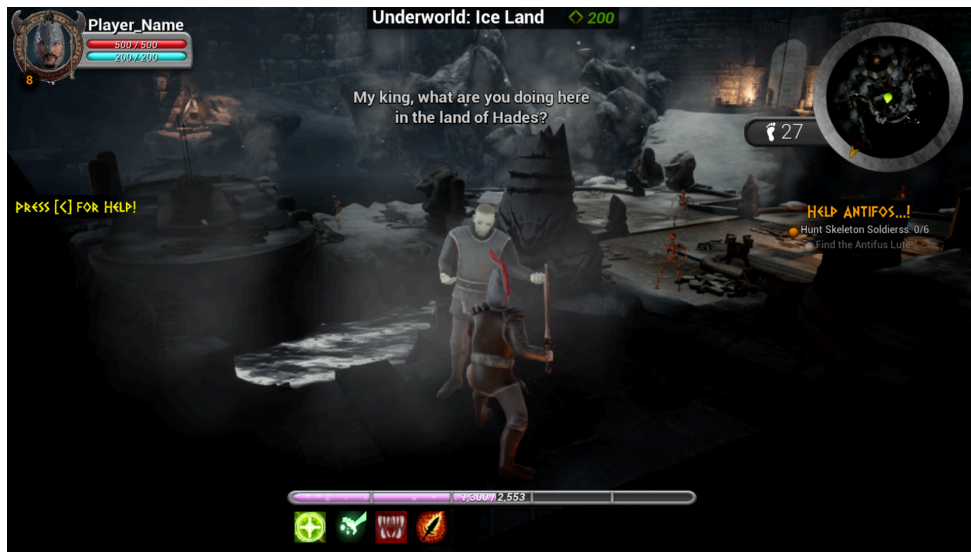


Fig. 5.4 Virtual environment of the application from the implementation of the game



Fig. 5.5 Virtual environment of the application from the implementation of the game



Fig. 5.6 Virtual environment of the application from the implementation of the game



Fig. 5.7 Virtual environment of the application from the implementation of the game



Fig. 5.8 Virtual environment of the application from the implementation of the game



Fig. 5.9 Virtual environment of the application from the implementation of the game



Fig. 5.10 Virtual environment of the application from the implementation of the game

CHAPTER 6

Conclusions and Future work

6.1 Conclusions

Based on the above, a simulation game such as RPGs in combination with serious games can be combined into a fun and interactive game for users mainly of adolescence who will train each student for any skill, knowledge, etc. that we would like him to acquire. In the present diplomacy as an example we have the lesson of the Ancients from Homer Odyssey and in particular Rhapsody L, the oracle of Tiresias to Odysseus on how he can go back to Ithaca and his family. Although a very small sample of what the whole system can do, we see that the missions and trials that each student is called to perform are also interactive as he has to interact with the game world, explore the map, unlock doors to move forward, etc. He can also interact with both the game's NPCs and AIEnemySystem, the opponents he will have to beat during his missions. This game as a system function and as a type of game meets all the specifications of a commercial RPG game with the only difference that the missions, in addition to their interactive and entertaining part, can also be training for the student who will play this game. So the general result and the initial goal of this dissertation, to transmit knowledge to a student by playing a serious game but at the same time to be fun and interactive for the student you achieve.

6.2 Future work

As a future work and development of the present work is the evolution of the current system from RPG to MMORPG. In this game, however, we will not limit ourselves only to the history of Odysseus, but to the whole history of the world. Through Unreal we can create from satellite images a virtual world with a map of Ancient Greece or modern and not only. We can digitize the entire globe and on a scale basis create an exact copy of the earth digitally. In this project it is not necessary to limit ourselves only to learning the history of the world. We could add any course (mathematics, physics, chemistry, etc.) to be learned depending on the type of mission. In addition, the fact that the game will be online, students from schools all over the country will also be able to communicate with each other, interact and even participate in school knowledge struggles in real time. The students will not have a single character that will give the game but more. They will be able to form the friend of the character of the appearance even the breed he belongs to. If we take Ancient Greece as an

example, a student could start as a Minoan, a Spartan, AthenaesusDanaos, etc. Finally, based on the recent changes in global climates that we had in the wake of Covid-19, teachers and students could create virtual classes through this system. But regardless of the virtual classes, the concept is to provide a space that you will call "ClanHall" for the members of each real class separately that these members among them will form a "Clan" group. Teachers who will also want to interact with their students through the game will have the role of "ClanLeader" which will be able to easily create simpler types of missions to their students on their own with the aim of always learning. Depending on the performance in the mission of each student, the teacher will give him the appropriate "Reward" award which will logically be objects (uniforms, weapons, coins) that will help the student in his path to the game. Finally, the GM "GameMasters" of the game will organize weekly events "Events" in which students from all over Greece will participate at the same time. An example of such an event is the siege of Troy. Of course, with the passage of time, upgrades and expansion in the game with new maps, new missions, new races, etc. will exist. The creation of such a game will bring to a great extent much closer both the students and the schools of the whole country and both students and teachers will be able to gain a lot from such a project.

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