



# ENCORE

AN IMMERSIVE HISTORY GAME

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Supervisor: Judith Good

[j.good@sussex.ac.uk](mailto:j.good@sussex.ac.uk)

BSc (Hons) Games and Multimedia Environments

Department of Informatics

University of Sussex

2020

## Statement of Originality

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This report is submitted as part requirement for the degree of Games and Multimedia Environments (BSc) at the University of Sussex. It is the product of my own labour except where indicated in the text. The report may be freely copied and distributed provided the source is acknowledged.

## Acknowledgements

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## Summary

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“Encore” was created with a singular purpose; to promote a bridge between the distinctly separate worlds of games that are enjoyable and those that are educational. Past works by Habgood, J., Ainsworth, S. and Benford, S. (2005) and Olivotos (2019) have demonstrated the potential for games that teach simple and advanced mathematics; the latter showcasing a massively multiplayer online environment in which to learn. This prototype is a single-player adventure game focused on recreating and gamifying historical events with a high degree of accuracy. Through interactions with non-player characters (NPCs), players are given an insight into the lives and relationships of both colonial and native people in North East America during the early 17<sup>th</sup> century.

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# Introduction

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## Motivation

Playing games is my oldest hobby and one of which I never get tired. I am also a keen learner and while the combination of these two things should seemingly suit me perfectly, I cannot help but associate the phrase “educational games” with a sour taste in the back of my mouth. However, I truly believe that video games have the potential to be an incredibly powerful learning tool. Regardless, game studios operate with the aim of making money and without proving that such a product would be commercially viable, they will neglect to commit any amount of resources to this pursuit.

This is why I developed a high fidelity prototype to demonstrate that games can include strong educational presences without sacrificing any enjoyability of the gameplay. My hope is for numerous game development studios to undertake the challenge of creating games that teach various topics while maintaining the highly enjoyable nature of their previous titles.

## Aims and Objectives

My primary objective was to prove that educational games could offer the same entertainment potential as non-educational games (specifically in teaching history, as past studies have attempted to show this with mathematics (e.g. Habgood, J. (2005) and Olivotos, I. (2019)). I hoped to make an experience comparable to similar games in the same genres with regards to entertainment.

A secondary objective was to test and expand my knowledge and experience of programming and all stages of the game development process. As I hope to find a job inside the game industry upon graduation, I aimed to produce a solution that demonstrates valuable, marketable skills.

Additionally, it was a personal aim to provide a more accurate representation of native Americans, colonials and the relationship between them, as I often hear misconceptions and misinformation on the subject.

## Target Audience

The target market may be considered to be all those who identify as “gamers”, as the idea is to develop a solution that is equally appealing as similar alternative games. However, as a learning tool, the game proposes maximum value to gamers interested in expanding their history knowledge and history teachers looking for ways to make lesson content more engaging for their students.

The target audience should be inclusive of all who have interest, regardless of age, gender, religion or race; the only factors by which individuals should be excluded are that they lack the mental capacity to understand what happens in the game or that they do not enjoy games as an entertainment medium. For example, the game is not suitable for young

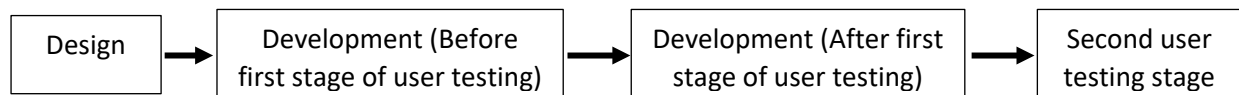
children and those who cannot read, as it requires an ability to understand written text. I am working with a provisional 10+ age rating.

## Project Relevance to the Degree

I chose to study Games and Multimedia Environments because I have a specific interest in game development and it is this interest that caused me to focus on this element of my course as the format for my course. It ties together programming knowledge taught through various modules throughout multiple years, game design and development learned in second year and technology enhanced learning environments, which I studied in my final year alongside this project.

## Project Plan

My initial design plan followed advice from my supervisor and was based on a preliminary design stage followed by iteratively developing the game through multiple user testing sessions:



Due to unforeseen circumstances, development was delayed and issues around arranging evaluation sessions prevented me from getting more than one set of user test feedback. The revised project plan involved a heavy design stage followed by a comprehensive development stage to implement as many design requirements as possible, then gathering only one set of user test data to formulate ideas for future work adaptations.

Design	Development	User Feedback
Create detailed designs for production, with special focus on creating a robust solution to avoid the need for a redesign later.	Implement those ideas outlined in the design stage, prioritising production of a playable product before polishing any areas extensively.	Perform user tests of the solution as is at the end of the development stage and record feedback as suggestions for future work.



# Professional Considerations

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## Ethical Issues

There are two categories of ethical issues that must be considered in this project; one is the research ethics, which concerns ethical issues that may arise during the execution of this project; the other involves the use of potentially sensitive content in the game which would be seen by users in a scenario where the game became published.

The main risks in regards to research ethics are those posed to volunteer testers. To combat this issue, the university provided a list of twelve declarations which must be adhered to so as to ensure participant safety and wellbeing. I have included a signed copy of my ethical compliance form in Appendix A; it has also been signed by my supervisor, who has independently confirmed its validity.

In regards to ethics surrounding games as a platform, I referred to the ESRB rating guide (2020) used for classifying the age ratings of published games and providing an overview of the sensitive content they contain. As the majority of those learning history are children, I refrained from including any potentially harmful content (e.g. gore, profanity, drug use, nudity and gambling). This is in line with the “Everyone 10+” rating. Though I did not include violence in this game, it has occurred frequently in history and my chosen rating permits “fantasy or mild violence”, which could occur in extensions to this work while maintaining the same age classification.

## Professional Issues

As a British informatics student, I feel obliged to follow the rules laid out by the British Computer Society (BCS) in their code of conduct. After review of the principles laid out in the code currently available on their site (BCS, 2020), I am confident I have upheld all requirements.

The following are the issues relevant to my game, with comments of where I adhered to them.

*1.c. Conduct your professional activities without discrimination on the grounds of sex, sexual orientation, marital status, nationality, colour, race, ethnic origin, religion, age or disability, or of any other condition or requirement.*

Participants for user testing were chosen solely based on availability and willingness to take part.

*1.d. Promote equal access to the benefits of IT and seek to promote the inclusion of all sectors in society wherever opportunities arise.*

My project promotes the use of technology in education.

*2.a. Only undertake to do work or provide a service that is within your professional competence.*

I proved my professional competency by successfully achieving the goals I committed to work towards.

*2.e. Respect and value alternative viewpoints and, seek, accept and offer honest criticisms of work.*

During testing, I encouraged participants to offer honest, unbiased feedback of my game and considered all criticism seriously in making adjustments to the design and implementation of the final solution.

*2.g. Reject and will not make any offer of bribery or unethical inducement.*

No incentives were offered for participation in the study; participation was entirely voluntary and no bribery took place.

*3.a. Carry out your professional responsibilities with due care and diligence in accordance with the Relevant Authority's requirements whilst exercising your professional judgement at all times.*

This project was undertaken as part of an undergraduate course at the University of Sussex and as such, I have also adhered to the university's ethical standards.

*3.d. **NOT** disclose or authorise to be disclosed, or use for personal gain or to benefit a third party, confidential information except with the permission of your Relevant Authority, or as required by Legislation.*

No personal information was collected as part of the user testing process and as such, participants cannot be identified from the data recorded.

*4.d. Act with integrity and respect in your professional relationships with all members of BCS and with members of other professions with whom you work in a professional capacity.*

During production, I used shared resources and hardware available at my university. In order to be respectful of other staff and students at the university, care was given to respect everyone's equal right to access these resources. All ethical considerations have been reviewed and approved by my supervisor.

## Design

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### Background Research

While I was able to find some work regarding educational history games (Squire, K., 2003), the majority of work on the subject of educational games seems to have focused on teaching mathematical concepts, as this is one of the most common subjects to be complained about by students; however, I still believe it offers insight into educational games as a whole.

One such game is *Zombie Division* by Habgood (2005), which led to the research paper “Endogenous fantasy and learning in digital games” (Habgood, J., Ainsworth, S. and Benford, S., 2005). This paper explores the relationship between education and fantasy games by integrating education directly into the gameplay; in *Zombie Division*, enemies display a number above their head and you can only defeat them by hitting them with a weapon for which the assigned number is a factor of the number above the enemy’s head. The result was that while endogenous fantasy may not critically improve the effectiveness of learning in games, “flow, representations, and game mechanics” that are common in games may be core contributing factors to effective game-based learning.



*Zombie Division (Habgood, 2005)*

Ilias Olivotos (2019) also explored educational games with his project *The Red Circle*, an educational MMORPG (Massively Multiplayer Online Role-Playing Game) that requires players to complete maths questions in order to progress in the narrative and restore “mana” (which is relied upon for in-game combat). User testing found that not only did participants find the game to be somewhat educational in learning mathematical topics, they found the game to be highly enjoyable; suggesting that education and entertainment in games are not mutually exclusive.



*The Red Circle (Olivotos, 2019)*

One paper that explored a non-mathematical basis is “From competition to metacognition: designing diverse, sustainable educational games” by Foster, S., Esper, S. and Griswold, W. (2013). This study explored “seamless integration” – the idea that educational games should integrate learning and play more effectively and in a natural way. They investigated the potential educational benefits of 1-on-1 competitive games; in this instance, a real-time strategy game which provides an IDE to allow users to write original spells using the Java API which can be used in game. Tests performed using second-year university computing students found that in writing new spells to expand the gameplay, participants exercised knowledge in areas such as coding constructs, software engineering and HCI, suggesting games can be used to teach more advanced topics than are typical of educational games. There are also some commercial, non-educational games which have influenced the design of my system. One such example is Telltale Games’ “The Walking Dead”. In this game, the player is frequently engaged in NPC interactions in which they are given up to 4 choices of responses; the player’s choice will determine the NPC’s next response and perhaps some of their future dialogues. When the player makes certain dialogue choices, a notification is displayed to inform them that the NPC “will remember that”. In this way, player engagement is maximised, as player’s believe they the autonomy to affect the outcome of the game and the interpersonal relationships of the fictional characters portrayed.



*The Walking Dead by Telltale Games*

A similar example of a commercial product that emphasises player choice is Bioware's "Mass Effect". Similarly, this game features a branching dialogue system; however, the player can also make choices as part of normal gameplay that affect the narrative of the rest of the game and even that of the sequel. These choices include (but are not limited to) choosing to spare or kill certain NPCs.



*Mass Effect by Bioware*

Inspired by Mass Effect and The Walking Dead, I implemented branching dialogues as I believe a sense of agency is vital for a truly engaging gameplay experience and that the



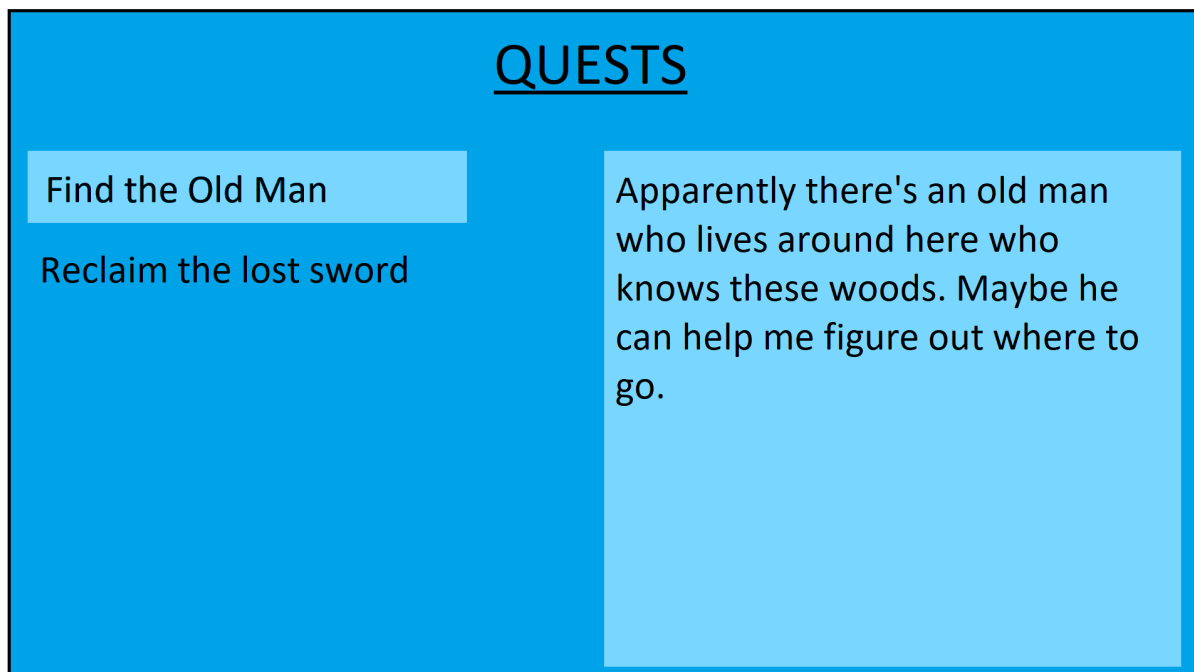
more players feel they have control over events transpiring in the game, the more seamlessly education can be integrated. In my initial design stage, I had hoped to implement branching narratives to show players not only what historical actions lead to what outcomes, but also how the outcomes might have been changed by making different decisions. This proved to be too much of a challenge to implement in the given timeframe. My project will differ from this existing work as it shall focus on teaching the discipline of history and will aim to be subtle in its educational aspects, such that players undergo learning without the awareness that they are playing a game designed to be educational.

## Concept Design

At this stage, I drew up some initial sketches to give a rough idea of how I wanted various elements to look, ensuring that the appearance appropriately implied their functionality.

### Quests

The menu was intended to be a simple overlay to display textual information regarding each quest.



*Initial Quest Screen Concept*

A list of quests would be displayed on the left hand side of the screen and when you hover over one with the mouse, a textbox showing additional information would be shown on the right.

### Dialogue

As is common in RPG games such as the *Final Fantasy* series, I aimed to create a dialogue system that would display lines of dialogue in a textbox on the bottom half of the screen. The name of the character currently speaking would be displayed at the top and to make it

more animated, letters would appear in sequence (i.e. the display would update to add one letter at a time).



*Final Fantasy Dialogue Screen*



*Initial Dialogue Screen Concept*

As giving the player a sense of autonomy is an essential part of the giving players an engaging experience, I also designed screens in which players can choose different dialogue options and receive different responses from NPCs (non-player characters).

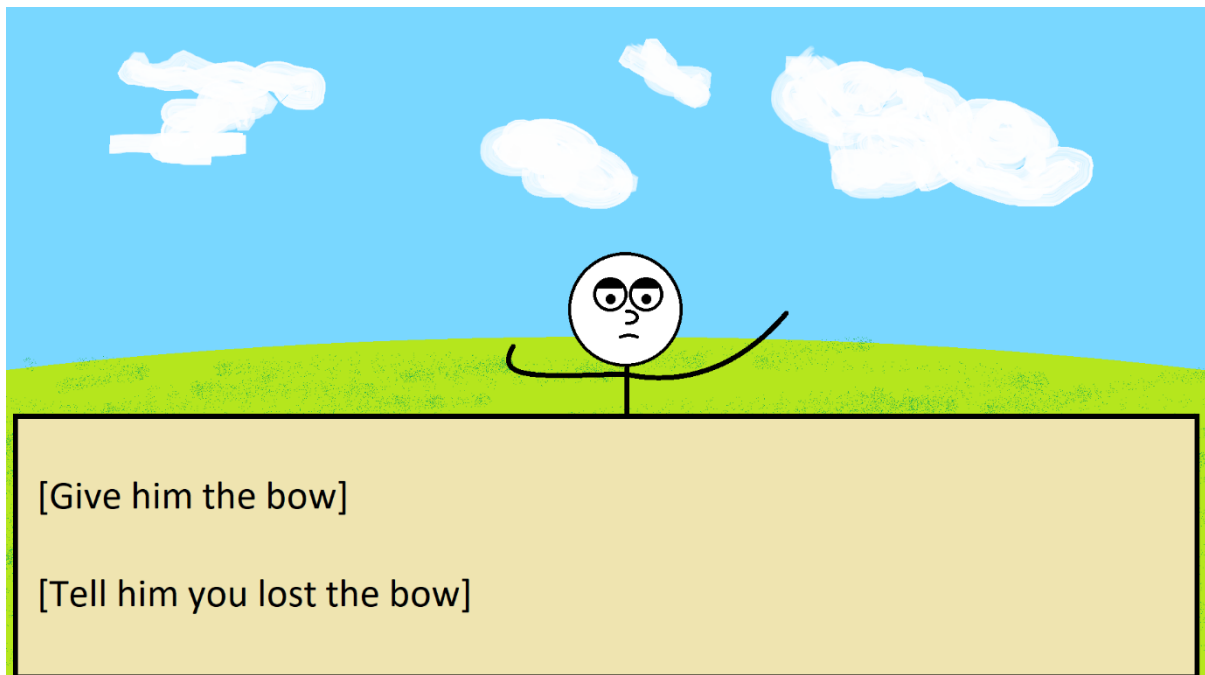


*Dialogue Choice Screen Concept*

The continue button would disappear when the user is required to make a choice and instead, they would need to click on one of three shown options to “say” to the NPC.

### **Context Choices**

In certain situations, the player should be able to make contextual choices that have an impact on the characters in the game and the story as a whole.



*Context Choice Screen Concept*



For simplicity, this followed the same visual pattern as the dialogue screen. The choices you can make would be displayed, but there would be no indication of the consequences of each choice; as such, you'd need to play the game and try giving different answers for the various choices in order to explore the different outcomes.

Upon reaching the development stage, I determined that this feature would be too time-consuming to implement and as such, it is not a part of my final submission.

## Requirements Analysis

Having settled on some initial design ideas, I created the following list of design requirements, for use during production to ensure development stayed focused.

### Functional Requirements

Requirement	Met
The software shall be playable by a single player on a single computer	
The software shall allow player movement in all three axes	
The software shall prompt users with NPC dialogue in text format	
The software shall store the results of user input when responding to NPC dialogue prompts	
The software will offer personalized dialogue experiences to the player dependent on their previous dialogue choices	
The software shall prompt users with context decisions in text format	
The software shall store the results of user input when responding to context decision prompts	
The software shall offer personalized narrative experiences to the player dependent on their context decision choices	

### Non-Functional Requirements

Requirement	Met
The software shall run on PC and Mac	
The software shall be playable using a keyboard and mouse	
The software shall be programmed in the C# programming language using the Unity game engine (version 2019.1.14f1)	
The software shall present all spoken and written word in the game in the English language	
The software should be playable using an Xbox 360 controller	

### Domain Requirements

Requirement	Met
The software shall be entertaining to use	
The software shall be educational	
The software shall have an aesthetically pleasing and intuitive user interface	
The software shall be suitable for audiences aged 15 to 25	
The software should ensure history knowledge learned during its use is retained	

# Implementation

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## Development Environment

For development I elected to use the Unity game engine as it is both powerful and versatile. Additionally, I have experience with both the engine and with C# scripting thanks to the Game Design and Development module I undertook in my second year, several courses on the learning platform *Udemy*, tutorial videos on YouTube and personal projects. Thanks to this experience, I was confident I could use the Unity engine to fulfil the objectives of this project.

## The Unity Engine

Like most game engines, Unity simplifies the process and workflow of game development by providing several components:

- Graphics – All rendering (including shading, shaders, and cameras) is handled by the Unity engine.
- Audio – Complex audio processing and playback features are managed by the engine and can be interacted with using Unity's API.
- Networking – There are various features for creating online multiplayer experiences using networks, though this is not used in my game.
- Physics – A realistic simulation of basic physics interactions is handled by the engine; gravity applies to all elements to which you add the "RigidBody" component and "Physic Materials" can be used in simplifying the process of defining new physics interactions (e.g. using a physic material with the friction set low, you can emulate ice for all objects moving over it, provided they have some recorded momentum). However, as the inbuilt gravity requires a RigidBody component to be on an object, it causes some limitations; in my solution, I instead used Unity's "Character Controller" component and calculated gravity manually.
- GUI – Unity provides an intuitive interface that allows you to visualise the finished 3D environments, properties of various objects and even the rendered, playable environment.
- Scripting – Though a lot of work is simplified through using the editor, programming must still be used to create complex custom behaviours. The Unity engine allows you to create C# scripts; you can trigger the construction of instances of these scripts or call methods within them using Unity's order of execution.

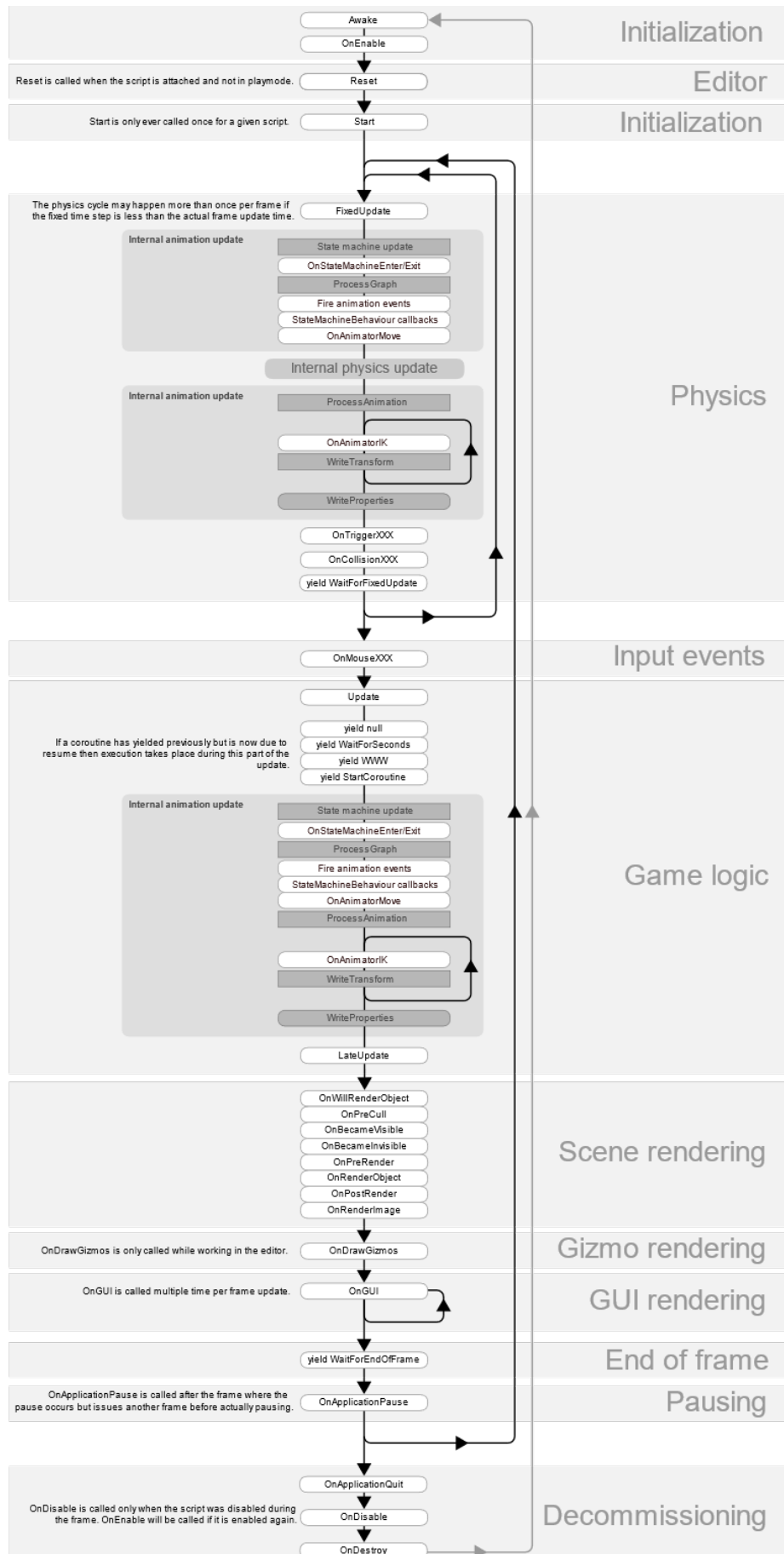
Unity's order of execution is the set of built-in methods that are called when a scene is first loaded. For example, if an object implements the Start() method, that method will be called when the scene first loads; if an object implements the Update() method, that method will be called every frame; if an object implements the OnApplicationQuit() method, that method will be called when the program is exited. A detailed diagram of all methods in Unity's order of execution can be seen on the following page.

## Legend

User callback

Internal function

Internal multithreaded function



## Unity's Order Of Execution

## Structure of Solution

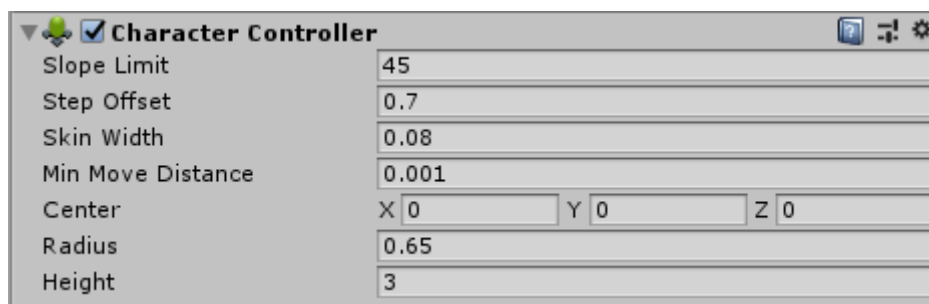
Following traditional object-oriented programming concepts, the solution is based on creating objects and giving them unique methods and variables. When the player interacts with each, methods in different scripts will be triggered to lead to certain events.

## Mechanics

### Player

The player operates through a number of scripts.

The player movement handles keyboard input for moving around, jumping and gravity and is based on Unity's in-built character controller system. This system provides definitions of various factors such as how steep a slope the player can walk up and how high a step they can climb.



*Unity's Character Controller System*

Mouse movement is handled by the "MouseLook" script on the camera component of the player. This takes mouse input and converts it to a usable variable for changing the rotation of the camera. Using the Mathf.Clamp function prevents the player from looking more than approximately 90 degrees up or down (i.e. it provides the same restrictions experienced when trying to look up and down in the real world).

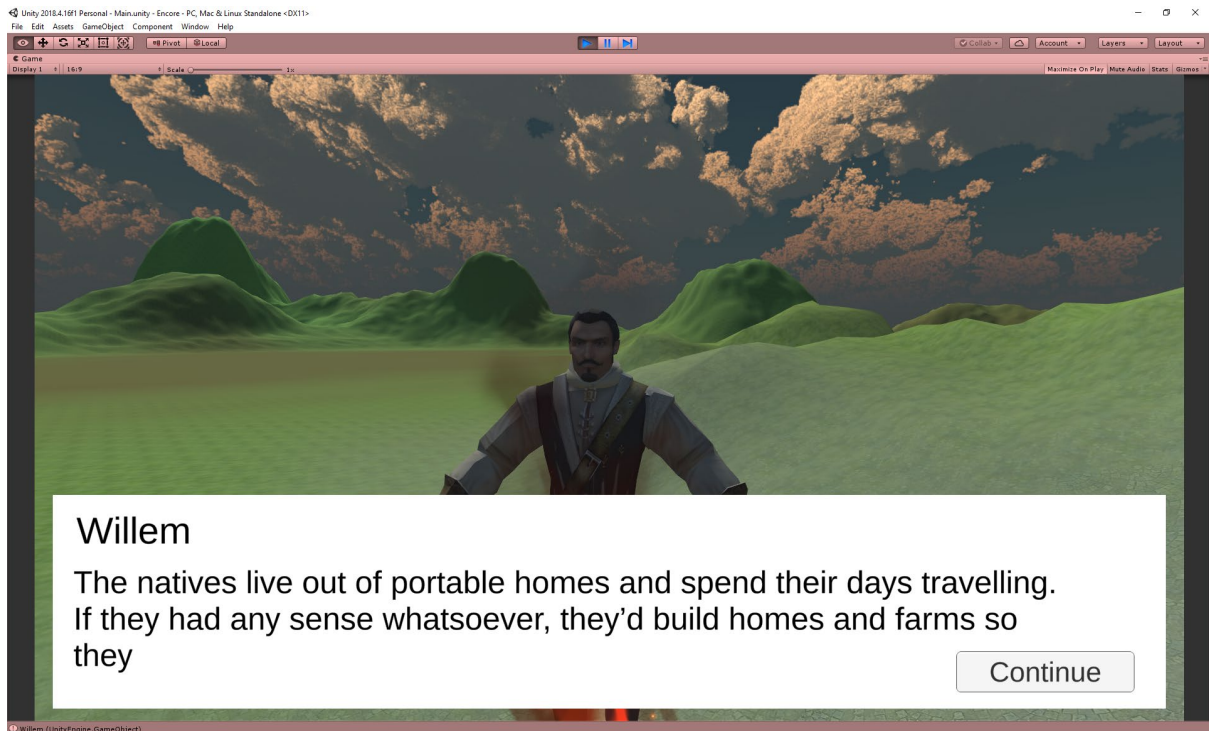
The player script handles all other keyboard input – specifically, the keys for opening the quest and pause menus. As the cursor is hidden during most gameplay, these functions also make it visible to allow you to interact with these menus.

### Dialogue System

As described in the concept stage, the dialogue works using a textbox that appears on screen and writes the text one letter at a time. You may progress through different dialogue systems using the continue button and one screens that require you to choose a response, you give input using the 1, 2 and 3 buttons on the keyboard.

Dialogue managed through a number of scripts – the dialogue manager handles the transitions and DialogueState holds information for each screen of dialogue. Dialogue state has the "CreateAssetMenu" attribute, meaning these can be created directly within the Unity editor. All dialogue was written using this method, so no dialogue has been coded in.

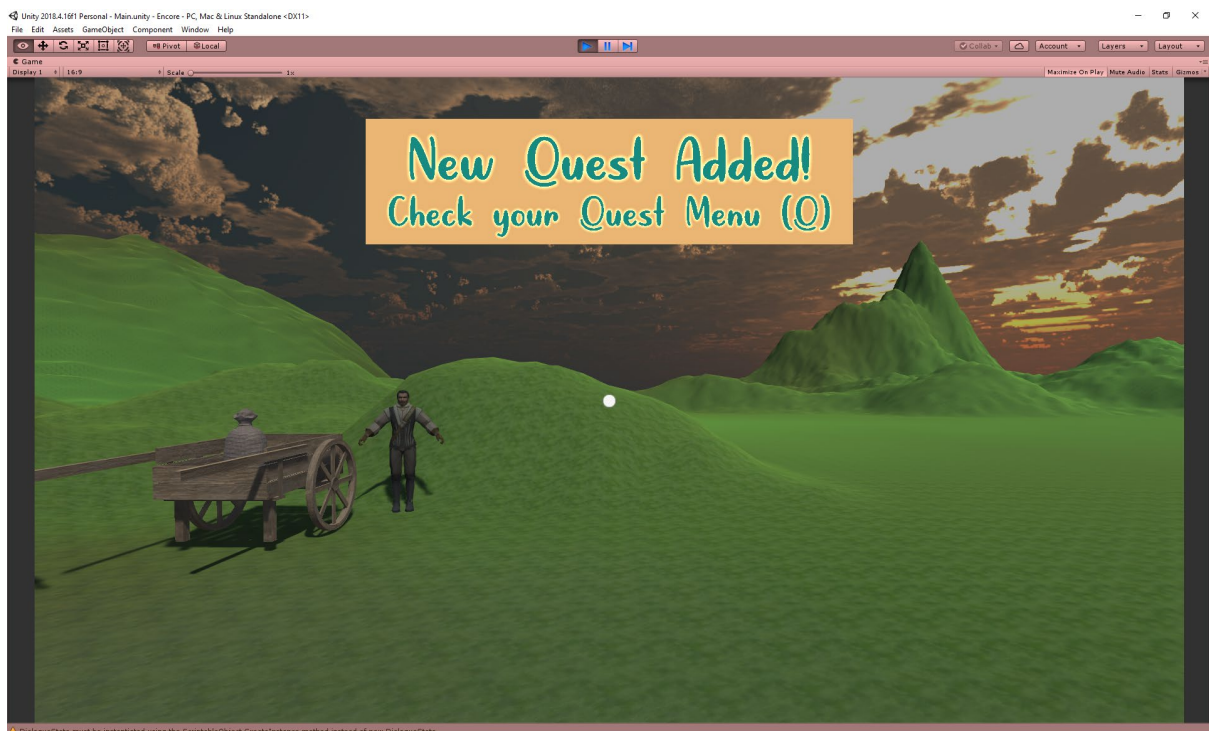
Because of this, it is quick and easy to write new dialogue, meaning this system is easily expandable.



*In-Game Dialogue*

## Questing System

The questing system keeps track of current quests and displays them in a quest menu. When you receive a quest, you get a notification that disappears after a few seconds.



### *New Quest Notification*

Quests can be viewed from the quest menu. Here, I implemented tooltips where the name of the quest is displayed and its description can be viewed by hovering over it. When you click on a quest, a secondary screen shows a list of goals that must be completed as part of that quest. If a goal is completed, it has a line through it. Goals also have tooltips to display their descriptions.



### *Quest Screen*

## Item System

I implemented an expandable item pickup system, where when you look at an item, text telling you to press E to pick it up shows. While you hold the E button, an on-screen progress circle fills up and when it is full, you pick up the item.

## Evaluation

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### Aim

The aim of the study was to gather feedback from users that fit into my target demographic and use this feedback to determine whether I had met my aims and objectives and to iteratively improve the final product. The key areas I focused on during testing were:

- How enjoyable/entertaining the game is
- The effectiveness of employed teaching methods
- The extent to which education is integrated in a fluid and natural way
- The intuitiveness of the UI and gameplay as a whole

### Methodology

Due to the lockdown caused by the Covid-19 pandemic, I had to adopt non-traditional methods of user testing, where I would ideally have liked to perform in-person testing sessions and interviews. However, I used social platforms Zoom and Discord to perform voice calls and use screenshare to get a similar testing experience.

The testing comprised of 4 stages: introduction, gameplay, interview and debrief.

The introduction stage merely consisted of friendly greetings before I gave a rundown of the game and its purpose (i.e. participants were told what the game is about and why I am working on it). They were then asked for formal consent to participate and were informed that they could leave at any time.

The gameplay stage was used to make observations on how players play the game (i.e. what they do). Each participant was sent an executable copy of the game and asked to screenshare themselves playing it. They were asked to give any thoughts they had as they out loud and as they occurred. During this time, I watched their screenshare and made notes where relevant.

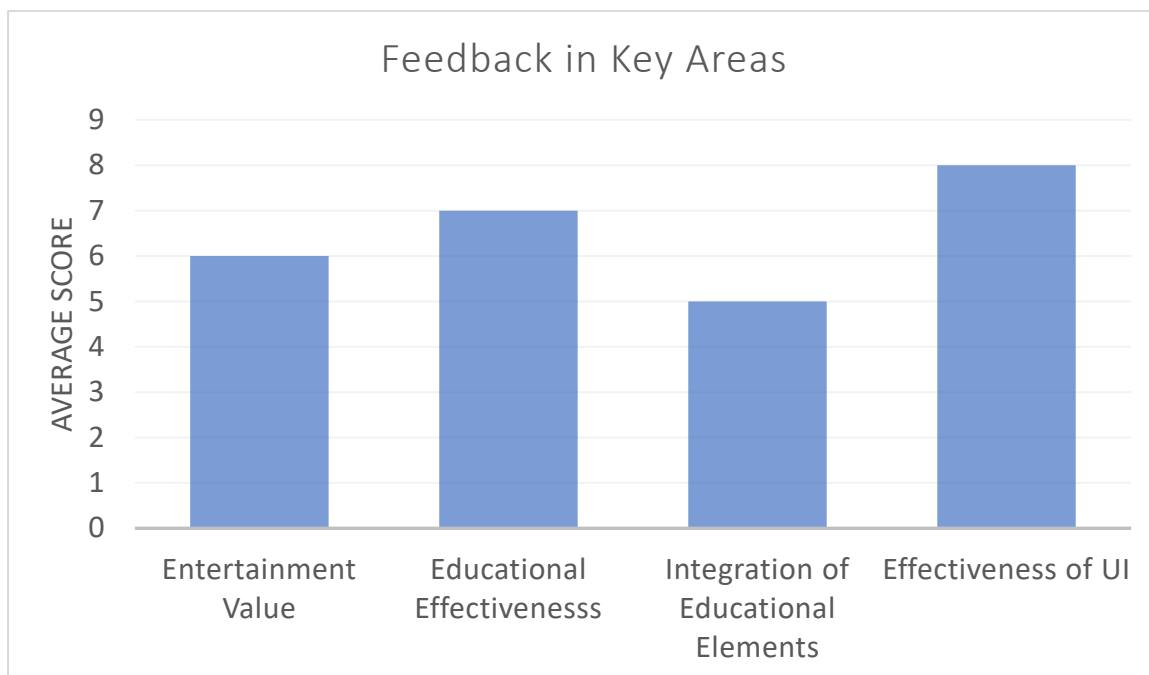
The third stage was a basic semi-structured interview. This was performed over voice chat and involved me posing questions from a prepared list and asking spontaneous follow-up questions when appropriate. Answers were received through spoken word and recorded via simultaneous notetaking.

In the final stage, I thanked participants for their time, assured them that all data received would be anonymous and then proceeded to tell them how I would use the answers they gave to improve the game.

### Results

The data gathered was entirely quantitative, as open questions were asked in order to receive the richest, most meaningful responses. I then gave used qualitative analysis each participant a score out of ten for each of the focus areas I highlighted in my aims. This was

calculated using a combination of their performance and engagement during the gameplay, the answers they gave during the interview stage and how their level of enthusiasm varied throughout the test. Results for the key objectives can be seen in the following table:



While the generally positive scores indicate that the solution largely met its goals, each participants individual critique highlighted key areas for improvement. As I was unable to implement these changes during the given timeframe, they were added to the list of ideas for future work.

## Requirements Review

At this stage, I can assess the extent to which I met the requirements as laid out in the requirements in the introduction of this report. The following tables show which requirements I successfully met.

### Key:

The requirement was successfully met	
The requirement was partially met	
The requirement was not met	

## Functional Requirements

Requirement	Met
The software shall be playable by a single player on a single computer	
The software shall allow player movement in all three axes	
The software shall prompt users with NPC dialogue in text format	
The software shall store the results of user input when responding to NPC dialogue prompts	



The software will offer personalized dialogue experiences to the player dependent on their previous dialogue choices	Met
The software shall prompt users with context decisions in text format	Not Met
The software shall store the results of user input when responding to context decision prompts	Not Met
The software shall offer personalized narrative experiences to the player dependent on their context decision choices	Not Met

### Non-Functional Requirements

Requirement	Met
The software shall run on PC and Mac	Met
The software shall be playable using a keyboard and mouse	Met
The software shall be programmed in the C# programming language using the Unity game engine (version 2019.1.14f1) <b>NOTE: Unity ver 2018.4 used instead</b>	Met
The software shall present all spoken and written word in the game in the English language	Met
The software should be playable using an Xbox 360 controller	Not Met

### Domain Requirements

Requirement	Met
The software shall be entertaining to use	Met
The software shall be educational	Met
The software shall have an aesthetically pleasing and intuitive user interface <b>NOTE: Some UI elements are aesthetically pleasing but some are too simplistic</b>	Not Met
The software shall be suitable for audiences aged 15 to 25	Met
The software should ensure history knowledge learned during its use is retained <b>NOTE: More testing required to clarify whether this is the case</b>	Not Met

### Time Limitations

Due to time restrictions, certain features were dropped. This was the case with “context” decisions, which would have been used to create branching narratives. Ultimately, the time it would take to create the system and implement all the narrative paths would have been immense and retrospectively, it would never have been feasible for a project of this scale with the given time limitations.

### Does it meet the user needs?

The primary user need was a game that is both educational and entertaining to use; as these domain requirements are met, I can conclude that this project has successfully fulfilled its purpose.

## Conclusion

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### Objectives Review

#### **Prove educational games can offer the same entertainment value as non-educational games**

Given the positive feedback received during evaluation, I am confident I have proved that educational games can be entertaining. However, as this project lacked the same resources, funding and amount of time that the majority of games by major development studios have, it does not in itself provide an equally entertaining experience. That being said, I believe it provides a strong argument that a more heavily funded educational game could be as entertaining as non-educational games.

#### **Expand my knowledge of programming and game development**

Throughout development, I was frequently searching for tutorials on YouTube, referring to courses on Udemy and reviewing the C# and Unity documentation. I have learned many new skills and cemented my previous understanding.

#### **Depict a more accurate representation of native American history**

While the narrative depicts a real historical event to a high degree of accuracy, I fear the game falls short of an accurate representation in many areas. For example, the models used to show native Americans and colonials do not necessarily reflect the appearance of natives and colonials in Northeast America during the early 17<sup>th</sup> century. Additionally, as these were the only free 3D models I was able to find during my research, duplicate models have been used to represent different characters and thus cannot showcase variety in fashion and appearance at the time. As such, I believe this was a success for the narrative aspect of the game but a failure for the visual aspect.

### Learning Outcomes

As previously stated, I have expanded my technical understanding of Unity, C# and the game development process. I have also gained an appreciation for the level of work required to produce large-scale projects and of the challenge faced in trying to balance education and entertainment in games.

As a side note, I have learned more about the historical period represented in this game and have expanded learned how to gather more accurate historical data.

### Future Work

As aforementioned, this project was massively limited by a lack of budget, resources, staff and time. As such, future work that has greater access to these factors should consider improving upon the areas in which I made sacrifices.

For example, characters should be created from scratch (i.e. modelled and textured) in a style most representative of the time. This would involve reference to artistic depictions of natives and colonists from the early 17<sup>th</sup> century – ideally, Dutch colonists and Lenape natives. On top of this, characters would be more convincing and engaging if they had voiceovers (for which each character has a unique voice) and custom animations.

Similarly, the environment is vague and while some effort was made to give the native American camp the impression of a real native living space, it does not reflect reality. The land should be modelled to be true to Manhattan (where the transaction of the sale of Manhattan took place) and the native and colonist living spaces should be appropriately decorated to appear as they may have at the time (again, with reference to artistic depictions).

A limitation of this game is that education cannot be expanded upon what is learned during the gameplay. To amend this, a publicly accessible wiki could allow more in-depth information to be given while staying true to the context of the game. In the same vein, the game could be expanded to represent various different historical events (e.g. life in feudal Japan, lives of soldiers in the trenches in WWII or the life of Julius Caesar).

Due to shortcomings of my own development, future work could consider implementing the context decisions and branching narratives that I did not. Through this, students could explore how different decisions in history might have led to different consequences and caused the world today to be different.

Finally, I believe this game provides a good precedent to show that educational games can teach various topics. As there are a huge number of topics one can teach and an immense amount of information for each, it is unfeasible for game developers to produce solutions that teach all of these. I propose that inspiration be taken from this game to work towards a code-free game engine, in which students and teachers can create their own learning games. This would allow teachers to customise the content for their own specification while ensuring a high level of engagement from students. Additionally, such a solution could be used by students to submit assignments to their teachers to showcase their understanding of different topics

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## Appendices

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### Appendix A

#### **Ethical Compliance Form for UG and PGT Projects\*** **School of Engineering and Informatics** **University of Sussex**

This form should be used in conjunction with the document entitled “Research Ethics Guidance for UG and PGT Projects”.

Prior to conducting your project, you and your supervisor will have discussed the ethical implications of your research. If it was determined that your proposed project would comply with **all** of the points in this form, then both you and your supervisor should complete and sign the form on page 3, and submit the signed copy with your final project report/dissertation.

If this is not the case, you should refer back to the “Research Ethics Guidance for UG and PGT Projects” document for further guidance.

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1. Participants were not exposed to any risks greater than those encountered in their normal working life.  
*Investigators have a responsibility to protect participants from physical, mental and emotional harm during the investigation. The risk of harm must be no greater than in ordinary life. Areas of potential risk that require ethical approval include, but are not limited to, investigations that require participant mobility (e.g. walking, running, use of public transport), unusual or repetitive activity or movement, physical hazards or discomfort, emotional distress, use of sensory deprivation (e.g. ear plugs or blindfolds), sensitive topics (e.g. sexual activity, drug use, political behaviour, ethnicity) or those which might induce discomfort, stress or anxiety (e.g. violent video games), bright or flashing lights, loud or disorienting noises, smell, taste, vibration, or force feedback.*
2. The study materials were paper-based, or comprised software running on standard hardware.

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\*This checklist was originally developed by Professor Steven Brewster at the University of Glasgow, and modified by Dr Judith Good for use at the University of Sussex with his permission.

*Participants should not be exposed to any risks associated with the use of non-standard equipment: anything other than pen-and-paper, standard PCs, mobile phones, and tablet computers is considered non-standard.*

3. All participants explicitly stated that they agreed to take part, and that their data could be used in the project.

*Participants cannot take part in the study without their knowledge or consent (i.e. no covert observation). Covert observation, deception or withholding information are deemed to be high risk and require ethical approval through the relevant C-REC.*

*If the results of the evaluation are likely to be used beyond the term of the project (for example, the software is to be deployed, the data is to be published or there are future secondary uses of the data), then it will be necessary to obtain signed consent from each participant. Otherwise, verbal consent is sufficient, and should be explicitly requested in the introductory script (see Appendix 1).*

4. No incentives were offered to the participants.

*The payment of participants must not be used to induce them to risk harm beyond that which they risk without payment in their normal lifestyle. People volunteering to participate in research may be compensated financially e.g. for reasonable travel expenses. Payments made to individuals must not be so large as to induce individuals to risk harm beyond that which they would usually undertake.*

5. No information about the evaluation or materials was intentionally withheld from the participants.

*Withholding information from participants or misleading them is unacceptable without justifiable reasons for doing so. Any projects requiring deception (for example, only telling participants of the true purpose of the study afterwards so as not to influence their behaviour) are deemed high risk and require approval from the relevant C-REC.*

6. No participant was under the age of 18.

*Any studies involving children or young people are deemed to be high risk and require ethical approval through the relevant C-REC.*

7. No participant had a disability or impairment that may have limited their understanding or communication or capacity to consent.

*Projects involving participants with disabilities are deemed to be high risk and require ethical approval from the relevant C-REC.*

8. Neither I nor my supervisor are in a position of authority or influence over any of the participants.

*A position of authority or influence over any participant must not be allowed to pressurise participants to take part in, or remain in, any study.*

9. All participants were informed that they could withdraw at any time.  
*All participants have the right to withdraw at any time during the investigation. They should be told this in the introductory script (see Appendix 1).*
10. All participants have been informed of my contact details, and the contact details of my supervisor.  
*All participants must be able to contact the investigator and/or the supervisor after the investigation. They should be given contact details for both student and supervisor as part of the debriefing.*
11. The evaluation was described in detail with all of the participants at the beginning of the session, and participants were fully debriefed at the end of the session. All participants were given the opportunity to ask questions at both the beginning and end of the session.  
*Participants must be provided with sufficient information prior to starting the session, and in the debriefing, to enable them to understand the nature of the investigation.*
12. All the data collected from the participants is stored securely, and in an anonymous form.  
*All participant data (hard-copy and soft-copy) should be stored securely (i.e. locked filing cabinets for hard copy, password protected computer for electronic data), and in an anonymised form.*

**Project title:** Encore

**Student's Name:**

**Student's Registration Number:** 21701966

**Student's Signature:**

**Date:** June 1<sup>st</sup>, 2020

**Supervisor's Name:** Judith Good

**Supervisor's Signature:**



**Date:** June 1<sup>st</sup>, 2020

## Appendix B

# Story

## Part 1

### Chapter 1 – Introduction

The screen fades in from black to a classroom. You are seated at the back of the class and can see that students occupy the other seats in the room. The teacher stands at the front of the class. He greets the students and tells them to bring out their History books so that they can continue their study of the colonisation of America.

As the teacher begins to talk about the topic of the sale of Manhattan, the screen starts to fade out to black.

## Part 2

### Chapter 2 – Where!? WHEN!?

The screen fades back in, this time to a different setting. A strange land, with water and grass. It appears quiet and rural. You move forward and see a man dressed in strange old clothes – those worn by Dutch colonists in the early 17<sup>th</sup> century.

When you talk to this man, you learn he is Peter Minuit, the famous Dutch colonist that first settled in the area we now know as Manhattan. When you speak to him, he is wary of you and questions how you got here. To him, your clothes, name and general manner are all very strange. He concludes that you must have been a stowaway aboard his ship. Not wanting his men to think he negligently set sail with a stowaway on his ship, he sends you to integrate with the native people, so as to appear as a native to the other Dutch sailors.

### Chapter 3 – A Civil Dispute

You move in the direction Minuit indicates until you come across a group of Native Americans. Not recognising you, some of them grab spears and move close to you, holding the spears up to you defensively. From behind them, you see an older native raise his hand and speak to those with the spears, after which they lower their weapons and retreat backwards. The older man moves towards you and introduces himself as Seyseys, chief of the Canarsee people. From him, you learn that he is in the process of making a deal with Minuit and is expecting the Dutch to deliver some goods to him. He tells you to retrieve these goods from Minuit and bring them to him, that they may consider Minuit's offer.

### Chapter 4 – Lost in Translation

You return to Minuit and relay this information. Though disgruntled that you failed to integrate yourself with the natives, he is impressed that you managed to communicate with them so easily. He assigns you the position of translator and commands you to take a bag of goods to Seyseys.



## **Chapter 5 – Peaceful Union?**

You take the aforementioned goods to Seyseys; he doesn't understand the purpose of some of the goods, so you explain them to him. He expresses appreciation of the gifts and that they are useful to him, but tells you that it is not enough to convince him to leave this place. He informs you that a much bigger gift would be required for the Canarsees to consider vacating their home.

Once again, you return to speak to Minuit and relay the information you learned from Seyseys. He is joyous to hear the news and implores you to remember this as a great day. The screen starts to fade out to black once more.

## **Part 3**

### **Chapter 6 – Rewriting History**

The screen fades back into the classroom as it was in part 1, except all the students have now left and the teacher is standing over you. It seems you fell asleep and woke up at the end of the lesson.

The teacher lectures you on the importance of paying attention in lessons and tells you that due to failures in your previous History exams, you are at risk of not graduating to the next year unless you achieve at least a B grade on your next and final report; a report on the purchase of Manhattan by the Dutch. The screen once again fades to black and the words "The End" appear. You then return to the main menu.

## Appendix C

### Dialogue

#### Main Story

[Scene 1 – Classroom Intro]

**Teacher:**

- Ok, everyone, I hope you remembered your history books. There are a few spares at the back but not enough for everybody.
- Last time, we had a brief look at the lives of native Americans before colonisation and saw that they had a very different life style.
- Today, we'll be looking at what happened when the natives and the colonists met and started to trade.
- Here's a fun fact for you; did you know the Lenape people, who resided in what we now know as Manhattan, sold their land for only \$24?
- It was purchased by the Dutch, who controlled the land for nearly 40 years until the British took the settlement by force and triggered the second Anglo-Dutch war.

[Scene 2 – Main Game]

**1. Peter Minuit**

- Halt! Who goes there?
- **You:** Um... Alex.
- What a ridiculous name; your parents must have disliked you greatly.
- State your business, "Alex".
- **You:** I'm just looking around. I'm not really sure how I got here. I fell asleep and woke up here.
- A stowaway, eh? Normally I'd have my men arrest you for coming aboard my ship unauthorised, but frankly, that's more work than it's worth.
- If I make it known that a scrawny kid managed to slip by me, I'll look inept.
- So you don't tell any of my men you were on my ship and you'll get to keep your freedom. Deal?
- **You:** Fair enough. Deal.
- Good. Now go and integrate yourself with the locals so it seems like you've been here a while. Look for chief Seyseys; he leads the "Canarsees", as they are known.

**[Once you've spoken with Minuit]**

- Get out of here.

**2. Chief Seyseys**

- Greetings, young one. I am Seyseys, chief of these people. Did the Dutch man send you here?
- **You:** You mean that Minuit guy? He said I should come and learn about your people, or something.
- I am glad to make your acquaintance. My people shall try to teach your people of our ways. We do not wish to fight, but we will not tolerate disrespect.
- **You:** ...
- Have you brought the supplies promised to us by chief Minuit?
- **You:** What supplies?
- We were promised many valuable items in return for my people leaving this land so the Dutch may reside here.
- He claims his offering is much needed by our people and that it's worth far more than our land.
- But we have yet to see it. We will not vacate our home based solely on the promises of strangers. We're not going anywhere until we see the goods.

**[Once you've spoken with Seyseys]**

- I have nothing more to discuss with you.

**3. Peter Minuit**

- What are you doing back here?

- **You:** Seyseys sent me back. He said something about bringing supplies you owe him?
- You what? So you told them you came with us after all? That's exactly what I told you not to do.
- **You:** Oh... sorry.
- But anyway, how did you get back so quickly? It takes our best and brightest hours to communicate even a simple message to these savages.
- **You:**
  1. They're not savages, they're people just like you.
  2. What are you talking about? He was pretty upfront   
so it wasn't exactly hard to figure out what he was saying.
- **[If 1]** Don't be ridiculous. Have you seen the clothes they wear? Or the way they dance around their fire? They're uncivilised. **[Return to questions page]**
- **[If 2]** You must have dealt with their kind before, to be such a fluent speaker! You've caused me a lot of trouble, but if you act as our translator, I'll forget your crimes.
- **You:** What do you want me to do?
- We're hoping to settle on this land. The river provides a good location for docking ships near here, so we can bring supplies from the Netherlands and trade with the locals.
- We only brought some supplies, but I've put together a selection of items to show the natives.
- If they like what they see, we can bring more goods from home to give them so they will move.
- Take the bag on the cart there and bring it to chief Seyseys. Tell him of my proposal and let me know what he says.

**[Once you've taken the goods]**

- Talk to me again when you've shown our wares to chief Seyseys.

#### 4. Chief Seyseys

- You have returned. Do you bring chief Minuit's offering?
- **You:**
  1. Yes, here you go. [Give bag of supplies]
  2. Not yet.
- **[If 1]** Excellent. Let me see...
- Many of these items are strange. I am unfamiliar with their purpose.
- **You:** [Explain what the various tools are for]
- I see. These items may prove useful to our tribe, we shall keep them as your offering.
- However, this land is worth more to us, so we ask that your friends offer a greater gift if they wish for us to vacate this area.
- **[If 2]** Then we have nothing to discuss.

**[Once you've given the goods]**

- My people appreciate your kind gesture and hope it marks the start of a peaceful understanding between our tribes. However, a greater offering is required if you wish for us to leave these lands.

**5. Peter Minuit**

- What news do you bring?
- **You:** Seyseys accepted the items but said he's not leaving unless you give him a lot more.
- Excellent! The way our communications were going, it was hard to tell if we were heading towards peace or war.
- Soon you shall bear witness to a momentous occasion: the settlement of New Amsterdam!
- **You:**
  1. Wouldn't Manhattan be a better name?
  2. ...
- **[If 1]** What kind of a name is that?
- **[If 2 and after response 1]** Today – May 24<sup>th</sup>, 1626 – the great Peter Minuit settled on American soil for a mere 60 guilders!

[Scene 3 – Classroom Ending]

**Teacher:**

- Alex...
- ALEX!
- Wake up! I hope you had a good nap while the rest of us actually studied.
- You received an F in your last 3 essays. Unless you get a B in your next report, you'll have failed History as a whole. You know what that means?
- **You:** Yes sir. I won't be able to move up into the next year.
- That's right. Believe me, I'm really trying to help you here, but I can't do anything if you don't help yourself.
- Do yourself a favour and study. I mean really study, like you've never studied before.
- This next report is on a specialist subject; the sale of Manhattan from the native Americans to the Dutch colonists. This isn't going to be easy, you're going to need to give it everything you've got if you want to pass.
- **You:** ...
- Ok, let me give you a hint. Nobody was really there; nobody knows what actually happened. Look at the source materials; written documents from the time and the such.
- Use your head and read between the lines. You don't need to tell me what really happened, only what might have happened. But make it convincing. Make it real.

## NPC Encounters

### Native Americans

- These white men are strange, but they have many tools and supplies that would be useful to our tribe.
- The Dutch people have powerful weapons and fancy clothes, but they don't appreciate the value of the land and of the soul.
- Welcome to our tribe! Respect our customs and our way of life and we'll get along just fine.
  - **You:** Do the other tribes share your customs?
  - Those friends you came with think so. We share some customs and differ on others. No two tribes are the same.
  - Battles have been fought and lives have been lost because of our differences. We have learned to coexist as separate tribes by inhabiting different places.
- We get on ok with the Dutch, but I don't trust them. They care more for lifeless possessions than for the invaluable gifts of nature.
- The Dutch try to pay us to leave this land. We are happy to take their goods, though most of this area is controlled by a neighbouring tribe, the Wecquaesgeek.

## Colonists

- The indigenous people are incredibly odd. They don't seem to realise the value of their land. We're certainly not keen to tell them; those fools are basically giving it away.
- The natives live out of portable homes and spend their days travelling. If they had any sense whatsoever, they'd build homes and farms so they don't have to move all the time.
- I miss the Netherlands. I don't see what's so great about this place. Not worth settling if you ask me.
- What strange clothes! You don't seem like a native though. Tell me, where are you from?

○ **You:**

1. England



2. America



3. The Netherlands



○ **[If 1]** Ha! I always knew you English were a little odd, but this is just bazaar. Where are the rest of your people?

○ **You:** Back in England, I suppose.

○ They stranded you here? How unfortunate.

○ **[If 2]** Oh, so you are a native? Are you with these... "Canarsee" people?

○ **You:** No, I'm from a different... uh... tribe.

○ Are they much different from the people here?

○ **You:** Actually, I think my people are a lot more like yours.

○ I highly doubt that...

○ **[If 3]** Ahaha, nice try! I think I'd notice if someone dressed like that went walking around my homeland.

○ Eh, but fashion moves so quickly and I don't have much need for it as a sailor, so who knows.



## Appendix D

### Quests

#### Main Story

*[Given when you first arrive on the island]*

**Where Am I?** – Figure out where you are

- **Talk to Peter Minuit** – You have learned that a man known as “Peter Minuit” can be found nearby. Make his acquaintance.

*[Given once you have spoken to Peter Minuit]*

**New Friends** – Find the chief of the local Canarsee tribe

- **Talk to Chief Seyseys** – Minuit has instructed you to integrate yourself with the local tribe.

*[Given once you have spoken to Chief Seyseys]*

**Ah, the Errand Boy** – Return to Peter Minuit

- **Talk to Peter Minuit** – Seyseys wants to see the goods promised to him by Peter Minuit. You should let him know.

*[Given once you have spoken to Chief Seyseys]*

**Lost in Translation** – Try to negotiate with chief Seyseys

- **Find Minuit’s Goods** – Minuit informed you that there is a bag of goods ready to be taken to chief Seyseys on a cart nearby. Find them and pick them up.
- **Take the goods to chief Seyseys** – Looks like your communication skills impressed the Dutch leader. He wants you to give some items to the chief of the Canarsees.

*[Given once you have given Minuit’s items to chief Seyseys]*

**Alex in the Middle** – Head back to talk to Minuit once again

- **Relay Seyseys’ answer to Minuit** – Looks like the Canarsee chief liked the goods, but doesn’t think they’re worth his land. You should tell Minuit he should send more.

## Side Quests

*[Given when you first arrive on the island]*

**The Great Canarsee Tribe** – Get to know the locals

- **Speak to the Native Inhabitants** – Talk to at least 4 Canarsee tribespeople.

*[Given when you first arrive on the island]*

**Dutch Tourists** – Learn about the Dutch visitors

- **Speak to the Colonists** – Talk to at least 4 Dutch sailors.