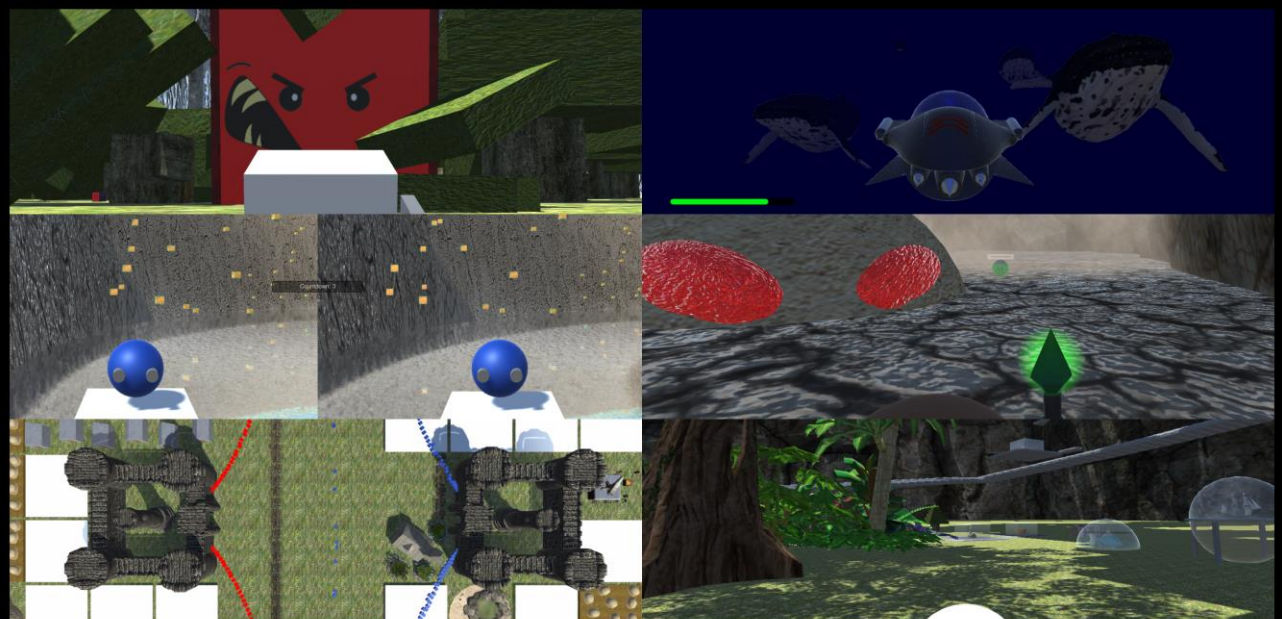# Continuation Desire and Player types

A Framework for testing Continuation Desire in Games Based on Player Types

Spring 2017 – Medialogy Master
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Action, Social, Mastery, Achievement, Immersion, Creativity -
- What type are you, what makes you continuate?

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Abstract: Games is a widely used medium in which there are millions of active players world wide. As such it is a testament in relation to their compelling nature, and therefore discovering what makes a game successful is useful from the perspective of businesses who are creating games, as well as the academic world. The use of the first is in relation to creating better games that will render a profit, where the latter can benefit in creating educational games or other games related to the game-genre 'games for good'.

This project attempts to create a framework that can be used for testing games, where the components of said framework was constructed in relation to Self-Determination Theory, Continuation Desire (as a concept), Flow Theory and Player types.

In order to test the framework six games were created, which each was targeted a specific player type. Participants were then meant to take a player type test and play all games as to figure out if the test method, as provided by the framework, could accurately determine where the games had success and where they failed. This would show if the method could be used in discovering whether a game is correctly targeting a specific player type, and detect the games success in relation to continuation desire.

Only four participants completed the test, and as such these were used in order to discuss refinements of the method. The framework proved adequate enough as to propose a test method, but it still needs to be specified as in relation to which data that needs to be collected when testing with this method.

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1 Motivation

"This 'telephone' has too many shortcomings to be seriously considered as a means of communication."
– 1876 William Orton, President of 'Western Union'

"The horse is here to stay but the automobile is only a novelty – a fad." – 1903 President of the 'Michigan Savings Bank'

"Television won't be able to hold on any market it captures after the first six months. People will soon get tired of staring at a plywood box every night." – 1946 Darryl Zanuck, '20th Century Fox'

"I predict the Internet will soon go spectacularly supernova and in 1996 catastrophically collapse." – 1995 Robert Metcalf, founder of '3Com'

"Predicting the future is easy. Getting it right is the hard part." – Unknown
(Szczerba, 2015)

As the above citations indicate, technology, and especially new technology, may seem to get a rough start when emerging from the hands of an inventor. But who would ever have predicted when the first computers emerged, that they would shrink to backpack -, and even pocket size, while their effectiveness skyrocketed? Who would have thought that the computer would migrate from being a tool for computations, to the arcades, to the home, to the cellphone and even into cars with the self-driving car (Waymo, 2017) as the new craze?

When looking at one part of the computer market, namely the part about digital games, this is currently a billion dollar industry with over a billion people engaged playing, and it is expected to have continued growth in the future where new areas and countries are forecast to enter the market (Statista, 2017), (Research, 2017), (Data, 2017), (Graham, 2017), (Kuss, 2013). This alone is a testament showing that digital games can provide a powerful entertainment experience in which players can pour hours upon hours of their free time (esa, 2015), (Statista, 2014), or even make a profit of it if they enter eSports (eSports, 2017).

Much still needs to be understood, however, about why games makes us want to continue playing them so badly that it has been proposed to make "gaming addiction" a medical accepted condition (Khan, 2007), (Kuss, 2013) with research pitching in to investigate not only pathological gaming but also pathological use of the internet (Young, 2009), (Gentile, et al., 2011), (Lam & Peng, 2010), (Nielsen, 2013). Hence research into what makes a digital game successful can have value from a business perspective, where "cracking the code" to the compelling nature of successful games may lead to the creation of other successful games in the future, which turns to profit for gaming companies. But from an academic and societal perspective, research into games and what drives humans to play them can give more than just a profitable outcome. Here, "cracking the code" could lead to better education systems where implemented game elements, also known as gamification

(Groh, 2012), could fuel student motivation in learning situations. Furthermore it could be used to better games that aims at promoting awareness of a specific topic such as poverty, environmental problems and social problems or help enhance games that should foster empathy and/or pro-social behavior - in other words the genre 'games for good' (Cobb, 2013), (Games for Change, 2017), (Belman & Flanagan, 2010), (Passmore & Holder, 2015).

But how does one "crack the code" and look into the compelling nature of games? Here another aspect of the problem also emerges, namely player types. One game that might be really good for one person, may hold nothing of interest for another. As such, when looking into this subject, I find it important to include player types in the equation, since this could be crucial when trying to target a specific group of people, or perhaps target as many people as possible (e.g. a game developer wants to create a game which sets focus on cancer, but in order to target as many as possible, he might need to create different versions of his game such as action oriented or story oriented, or create one game with many different features that caters to many different player types).

The above sets the baseline motivation for this project. However, going forward from that baseline could take numerous directions, and as such it is important to narrow down the scope of the project, which leads to the initial problem formulation (IPS).

1.1 IPS:

"*How can a test be set up in which the player type of a test subject is determined, and the test result focuses on the compelling nature of games and how it matches up with the player type?*"

From this IPS formulation, it is now important to look further into the components specified by it, such as: what is "the compelling nature of games" in the first place? How do we even define player types, and how should the experiment be constructed in order to test the whole ordeal?

1.2 The compelling nature of games

In regards to the compelling nature of games I will argue that it can be broken down into three subjects. The first is that playing games is often an intrinsic motivated behavior rather than extrinsic, where an individual takes initiative to play because they find the provided experience enjoyable. These two concepts, **intrinsic** and **extrinsic**, will be looked at in the next chapter, Analysis, where the source (Ryan & Deci, 2000) will be used. The reason for picking this source is that it utilizes the elements from the second subject, which are the psychological factors, involved when playing games. Here I will take a standpoint from the **Self-Determination Theory** (Ryan, Rigby, & Przybylski, 2006), (Przybylski, Rigby, & Ryan, 2010) as a mean to look into which psychological needs digital games satisfies. The third subject is **Continuation Desire** (CoDe) as defined firstly by (Schoenau-Fog, 2011a). The reason why I chose this subject is that although the above two subjects both looks into motivation and psychological need satisfaction in relation to games, they are not specific enough in terms of asking what the actual components of a game makes a player want to continue

playing. CoDe will provide such aspect for this project, which will make it useful in both the transformation of the IPS into the final problem statement (FPS) and the design approach which will be used for the design, which will be laid out in the 'Analysis' chapter. As a further aspect of the compelling nature of games I will also look into the subject of flow-theory which has proven to be a persistent theory that has not been disproven and relates well to the experience of enjoying to play games.

1.3 Defining player types

In regards to the component of player types, there have been made several attempts over the years to outline these, such as Richard A. Bartle's categorization of MUD (Multi-User-Dungeon) players (Bartle, 1996). Bartle's model (Figur 1) divides players into the four types, where players interacting with players are seen as '**Socialisers**' [sic], players acting on other players are '**Killers**', players acting on the world are '**Achievers**' and players interacting with the world are '**Explorers**'. But Bartle's model does not take much else into account, and it can be critiqued to be too simple for establishing player types where crossovers may happen. What would you for instance call a person who is equally an explorer and socializer? Or equally an achiever and socializer?
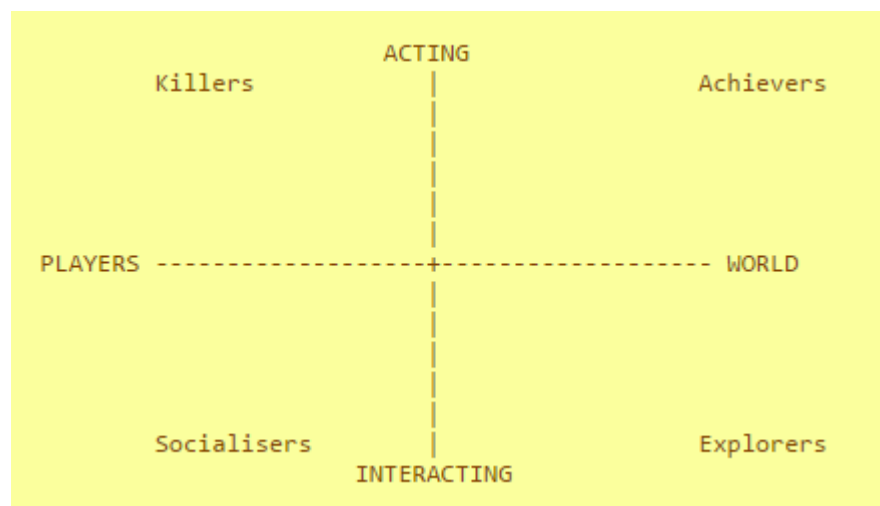
Figur 1 Bartle's model for four player types (http://mud.co.uk/richard/hcds.htm)

For the player types aspect one could also consider using what is commonly known as '**the big five**' personality traits: **Openness, Conscientiousness, Extraversion, Agreeableness** and **Neuroticism** , which was tested out in for instance this study: (Zammitto, 2010). But the big five model is a limited help when one wants to create a game based on player types. How would you for instance design a game for a person scoring low in the Openness trait which is roughly characterized as "down-to-earth, conventional, narrow scope" (Zammitto, 2010)? Or what would be an interesting gameplay for a person scoring high in Agreeableness which is roughly defined as "Trusting, helpful, sympathetic"(ibid)? Here I would argue that observing how a person plays may transfer into knowledge about that person's personality trait, as told by the big five, but transforming these into a general tool to be used for directing a game design to target a specific player type may be difficult.

What seems to be a better categorization of player types are presented by Nick Yee and colleagues (Yee, The Gamer Motivation Model in Handy Reference Chart and Slides, 2015), who have generalized these into six types with two sub-genres each: **Action** *Destruction*/*Excitement*, **Social**

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Competition/Community, **Mastery** *Completion/Power*, **Immersion** *Fantasy/Story* and **Creativity** *Design/Discovery*. As their research is based on a very large amount of participants (140.000+) from all over the world while their refined player types appears to persist across their gathered data, this suggests that their model is highly credible for defining player types. Therefore I will use their model for this project and as such it will be processed in the next chapter, 'Analysis', where it will be defined how it can be used for this project.

1.4 Constructing an experiment

As for the experiment aspect there are several subjects which needs to be considered, such as should the test be in the homes of the participants or somewhere else, how should the questionnaire be set up, how many should there be and should they play their favorite game or a custom made game? These subjects are typically tackled in the 'Methods' chapter; however, in the 'Analysis' chapter I will go through the selected sources for this project, where I find that these strike a chord in line with my project, such as the study about CoDe (Schoenau-Fog, 2011b) which developed a set of questions and named this the '**Engagement Sample Questionnaire**'. These test methods will then be used as inspiration sources for how I will set up my experiment.

1.5 Summary of the 'Motivation' chapter

In the above I have described my motivational reasons for this project about creating a test with emphasis on the compelling nature of games and player types, which both can be used by the industry and the academic world and society in regards to have a higher chance to create successful games. After this I broke down my IPS into three different subjects: the compelling nature of games, player types and constructing an experiment. The first of these three subjects was then broken further down into the subjects of intrinsic/extrinsic motivation, SDT and CoDe. For the player type subject I chose to select 'The Gamer Motivation Model' (Yee, 2015) to be utilized for this project. For the experiments part i argued that I will look into similar research to find useful components, such as the Engagement Sample Questionnaire.

In the following chapter, 'Analysis', I will go through the above subject firstly to specify the IPS into the FPS, where after I will go through sources that can be used for design, and end the chapter by setting up design requirements.

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2 Analysis

In this chapter I will firstly analyze the stated source as told from the motivational points of what makes a game compelling (intrinsic/extrinsic motivation, self-determination theory, continuation desire and flow theory), then I will analyze the source regarding player types before moving on to specify the IPs presented in the previous chapter into the FPS. After this I will present sources that are related with how to design games as to use for the design chapter, before presenting design requirements in relation as to how to create a product to test for this project. The chapter will then end with a summarization of the chapter.

2.1 The compelling nature of games

As stated in the motivation chapter, there are several subjects which are related to the compelling nature of games. As determined in the chapter, these were broken down into four subjects: intrinsic (and extrinsic) motivation, Self-Determination Theory (in relation to games), Continuation Desire (CoDe) and the flow-theory. As such sources found for this project which relates to these subjects will be analyzed and knowledge from these sources which is useful for this project will be specified.

2.1.1 Intrinsic/extrinsic behavior

In this section I will go through the source explaining what extrinsic and intrinsic motivation is and what this can be used for in relation to this project.

2.1.1.1 Intrinsic and Extrinsic Motivation: Classic Definitions and New Directions (Ryan & Deci, 2000)

In this source, the authors review research in relation to motivation as being divided into intrinsic and extrinsic motivation. They furthermore relate these two types of motivation with the 'Competence', 'Autonomy' and 'Relatedness' components from the Self-Determination-Theory (SDT). These components relate to the innate psychological needs of humans (and possibly other animals) as to feel that they have control of their own lives ('Autonomy'), are competent in relation what they are doing ('Competence') and are important/belonging to/are a valued member of their societal settings. By societal settings it is meant the social structures to which an individual needs to feel accepted and valued. This can for example be in relation to family, in regards to colleagues or in online communities. As such the psychological needs of said components are stated to have a significant impact on the well-being of people.

The authors of this source describe motivation as being "*moved to do something [...] where a person who feels no impetus or inspiration to act is thus characterized as unmotivated, whereas someone who is energized or activated towards and end is considered motivated*" (Ryan & Deci, 2000). They furthermore establish that people are not only able to have different levels of motivation, but also different types of motivations. They define "*the most basic distinction* [of motivational types as] *intrinsic motivation, which refers to doing something because it is inherently interesting or enjoyable, and extrinsic motivation, which refers to doing something because it leads to a separable outcome*" (Ryan & Deci, 2000).

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The authors argue that extrinsic motivation is often regarded as 'impoverished' even though it can be powerful, but that persons being extrinsically motivated can either perform a task with resentment or with an inner acceptance in knowing that a task will in the end benefit them. Intrinsic motivation, on the other hand, is regarded as rendering a better quality of learning and is regarded as less stable in keeping the same level as the extrinsic motivation. The authors present the following model (Figur 2) as to show how amotivation-extrinsic motivation-and intrinsic motivation fit into a taxonomy of human motivation:
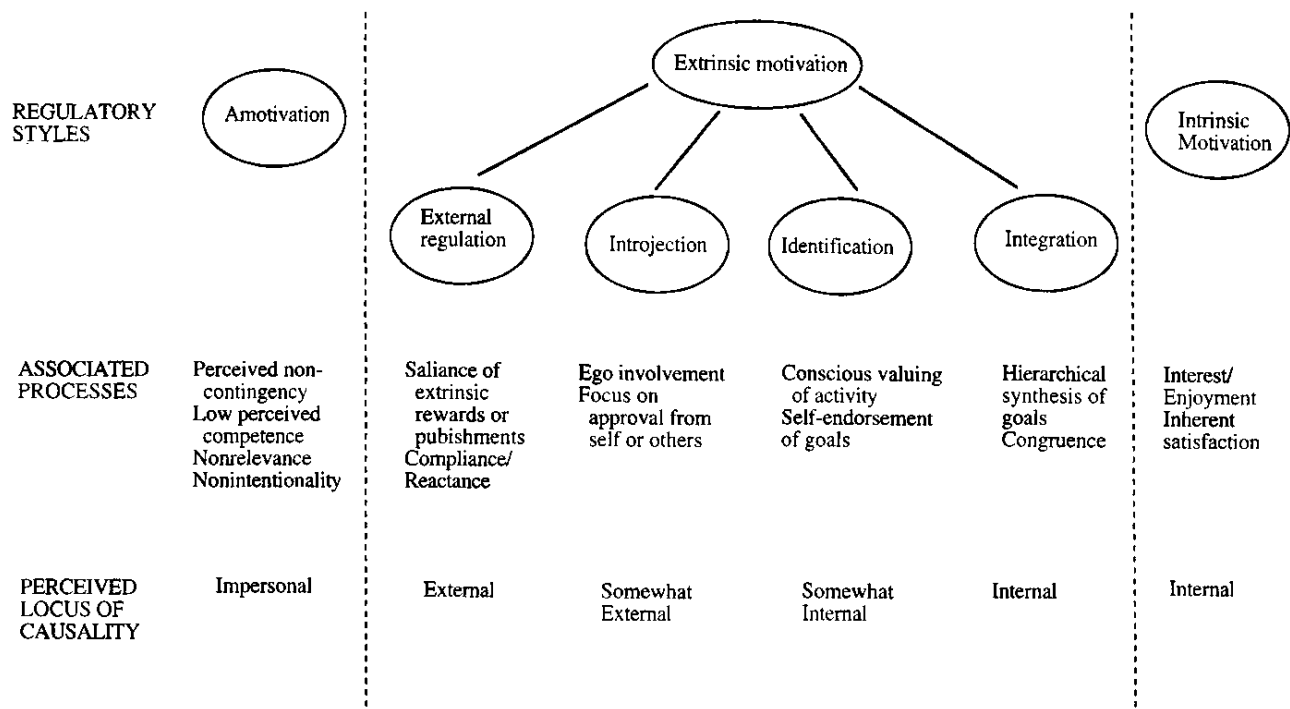
Figur 2 A model over the taxonomy of human motivation (Ryan & Deci, 2000)

On the model it can be seen that there are various degrees in terms of motivational levels. From the left to the right, the left side indicate the lowest amount of motivation, where the right indicate the highest level of motivation. The extrinsic motivation is presented as having four different levels of motivation and how internal it is perceived to be, where the intrinsic motivation is strictly personal of origin.

In relation to the SDT components, the psychological needs for 'Autonomy', 'Competence' and 'Relatedness', the authors claim that freedom to choose what to do and the level of felt competence in relation to a task can prompt intrinsic motivation in individuals (i.e. the components of 'Autonomy' and 'Competence' is needed to spark intrinsic motivation). The 'Relatedness' component, however, can help increase extrinsic motivation, where e.g. positive feedback on doing a task would feed the psychological need for 'Relatedness'. The authors specify that it is in any case critical to remember that intrinsic motivation can only occur if a task has the appeal of novelty, challenge or aesthetic values for an individual.

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As for extrinsic motivation it is further noticed that 'Autonomy' can have a positive effect, where a person who feels forced to do a task in order to avoid penalties entails less personal endorsement for the task, than a person feeling that he/she has a choice in taking up the task. The source states that in relation to extrinsic motivation, it is a problem as to how to foster 'internalization and integration' of a task such that an individual takes up said task with a feeling of personal commitment, which would be featured as the far right extrinsic motivational category in the presented model.

The source references studies performed which holds the background for the claims featured, as to relate the SDT components with extrinsic and intrinsic motivation. One such study presented was where students who were more externally regulated "*showed less interest, value, or effort, and the more they indicated a tendency to blame others, such as the teacher, for negative outcomes*" (Ryan & Deci, 2000), which supports the claim of a lower perceived 'Autonomy' level having a negative impact on individuals' motivational level.

2.1.1.1.1 Critique of the source
In relation to this source I have no negative critique. The subject and related research presented in the source is well-established, and the researches presented have been well grounded. I furthermore regard their argumentation as valid as to believe what they conclude in the report.

2.1.1.1.2 What to take away from the source
The usable aspect of this source is in relation to whether or not people who participates in my study will experience most intrinsic or extrinsic motivation. As the product that will be tested in this project is most likely going to be some video game, the knowledge of a participant's main motivation can be used as to see whether or not a created game is successful enough to create and sustain intrinsic motivation. As such it is needed to ask participants whether or not they were mostly intrinsic or mostly extrinsic motivated while playing the game.

2.1.2 Self-determination theory in relation to computer games
In this subsection the SDT will be looked upon as how it relates to computer games and what it can be used for in this project. As a further reference to this subject, the elements presented in the SDT of Autonomy, Relatedness and Competence will be referred to with the acronym CAR.

2.1.2.1 The Motivational Pull of Video Games: A Self-Determination Theory Approach (Ryan, Rigby, & Przybylski, 2006)
This source looks into four studies which applied the SDT when investigating motivation in regards to playing computer.

The source argues from a standpoint in related research, that gaming is a recreational activity, and that it has both been suggested that video games increase negative tendencies such as violence in players, and positive tendencies such as improvements in learning. In any case regardless of positive and negative effects, it is agreed upon that when gamers engage in gameplay experiences, this is because they get "*something*" out of it. The authors present work by Bartle (as also written about in the motivation of my project 1.3 Defining player types) and Yee (Yee, 2005) in relation to present their view on player motivations in relation to games and why people play them. They argue that the

presented motivations is more in relation to currently existing games, "*rather than the fundamental or underlying motives and satisfactions that can spark and sustain participation across all potential players and game types*" (Ryan, Rigby, & Przybylski, 2006). As such they argue that "*players of all types seek to satisfy psychological needs in the context of play*" (ibid) and hypothesize that games which can increase perceptions of the CAR components will enhance players' motivation to play. As subthemes in this regard they further argue that a high perception of the CAR components will lead to the feeling of 'presence' where a player feels that they are within a game's world, and that controls which are experienced to be "*intuitive*" will contribute to this as they can lead to a higher perception of 'Autonomy' and 'Competence'.

In the first study presented by the source, participants had to play 20 minutes of the game "Mario 64" (1996). Here it is stated that 'Relatedness' is not a part of this game, and as such the game is theorized to be more 'Competence' related, and in lesser degree 'Autonomy' related as the gameplay does not allow much freedom. After the 20 minutes of gameplay the participants had to fill out a questionnaire, and could decide after this if they wanted to continue playing "Mario 64" or an alternate game. In the results it was shown that participants who felt a higher competence were also more likely to continue, and rated their self-esteem higher in the questionnaire. The feeling of 'presence' in this study was furthermore shown to be more related to felt competence than autonomy.

In the second study two games, one with high ratings ("Zelda: The Ocarina of Time" (1998)) and one with low ratings ("A Bug's life" (1998)) was played on two different days by participants. Both games featured what is sated as "easy" controls and the authors theorized that the better rated game would be shown to have higher perceived levels of CAR. In the results the participants did favor the better rated game. As such it was shown that easy controls are not enough to motivate player towards playing a game, where it was only in relation to the better rated game that it had a significant positive effect. The results furthermore showed that differences in perceived competence and autonomy "*accounted for differences in preference for future play, enjoyment and presence*" (Ryan, Rigby, & Przybylski, 2006).

In the third study four different games with high ratings were selected for testing ((Super Mario 64, 1996), (Super Smash Brothers, 1999) , (Star Fox 64, 1997) and (San Francisco Rush, 1999)). The participants would play on four different days playing a different game each time. The results for this study supported the findings that greater satisfaction in autonomy and competence predicted higher enjoyment, sense of presence and higher preference for future play.

The fourth study involved players who were already engaged in a massive-multiplayer online game, which was "*selected because it already actively discusse[d] games and other Internet-based activities*" (Ryan, Rigby, & Przybylski, 2006). The players from the selected game were presented with a questionnaire which put up on an online forum related to the game, where it was expected that participants had experience with these types of games. It was expected that 'Relatedness' would be a large incentive for the people playing these games. The results showed that competence and

autonomy was still significant in relation to players' motivation, but it was also shown that relatedness was an equally important aspect of player motivation.

2.1.2.1.1 Critique of the source

I find that their perspective of including the psychological need satisfactory from the SDT valid, and I will argue that I find the CAR components as being topics to which a large variety of motivational aspects could be added to each component. An example of this could be to add e.g. the subjects of movement, ability to fight and roaming possibilities in a game to the 'Autonomy' component, while the 'Relatedness' component could be added the subjects of chat possibilities, decisions affecting the end of a story and the ability of creating an entire world in games. The source also mediates that a game does not necessary have to satisfy all of the CAR components, although that their last study presented indicate that trying to cater all of them can render a high motivational level for players. This means that when designing a game a developer can try to vary the gameplay in relation to the CAR components, where this could be specified for a specific player type.

Another argument I will state in relation to this source is in relation to why players may return to play some games. With the components of CAR a vast ground on human psychology is covered, however, I will argue that they are missing a component to explain the aspect of 'Sensing' (which is in relation to the 'Continuation Desire' sources featured later in the chapter). My argument stems mostly from a personal view in which I find that I sometimes crave to go back to a specific game just to experience a specific part of it in relation to visuals, music or just to use some controls which are inherently satisfying to me, which has nothing to do with the CAR components. Of cause it can be stated that just the action of going back to play a game is somehow related to 'Autonomy', but in relation to the aforementioned reasons to revisit a game, this is not the primary reason to revisit a game. As specific reasons to go back to replay a game, I can mention the following examples, such as to demonstrate the lack of the SDT CAR components:

1) Wanting to play (Sid Meyer's Civilization II, 1996) just as to discover the map, as I find it inherently satisfying to see what is hiding in the black tiles in the game (see Figur 3)
2) Playing (Fallout 3, 2008) in which I have my character lying on a cliff top and shoot off the heads of raiders with a sniper rifle, specifically just to hear the 'ring' sound of the shot when the weapon is fired in what is called 'VATS' mode (see Figur 3)
3) Playing (Tortuga – Pirates of the new world, 2004) for the reason of using the user interface buttons that allows players to buy and sell items in the harbors (see Figur 3)

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Figur 3 Games mentioned as examples of 'Sensing' - Top left 'Tortuga - Pirates of the new world' - Top right 'Sid Meyer's Civilization II' - Bottom left VATS-mode in 'Fallout 3' - Bottom right 'Fallout 3' as the sniper rifle appears when shooting in VATS-mode

I have to note in relation to this, that the aspect of 'Sensing' can very well be tied into the subject of behaviorism in terms of conditioning (see e.g. this source on the subject (Chance, 2003)). This is in no way to imply that the 'Sensing' aspect can be entirely explained from the perspective that players are conditioned to like features in games as based on the positive feedback they receive while playing them. It can on the other hand, however, not be denied that some of the features of a game that a player comes to like may stem from being conditioned towards it even if it is unintentionally. In any case, I will still argue that the SDT is lacking this aspect.

2.1.2.1.2 What to take away from the source

In terms of what to take away from this source, it is clear that the CAR components have a large effect on motivations (which was also stated about intrinsic and extrinsic motivation). As such, when designing the product for this project, these components should be taken into consideration. This will help in terms of creating an experience which is suitable in relation to how a participant's psychological needs should be satisfied when engaging with the created product. This can also be used in relation to player types, as different player types will most likely have the need for different amounts of the CAR components. As such the design of the project product will firstly specify player type components that need to be incorporated, where after the CAR components will be utilized in relation to this.

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2.1.2.2 A Motivational Model of Video Game Engagement (Przybylski, Rigby, & Ryan, 2010)

In this source the authors present that video games' innate ability to provide psychological need satisfaction for the CAR components is part of why they have a broad appeal on humans. Furthermore they look into the subject that violent games should prompt players to be more violent and that when people's everyday lives are chronically deprived of need satisfaction, they can risk to be obsessively engaged in video games.

The authors starts from the standpoint that they will apply the SDT to understand why video gaming can "*satisfy or thwart psychological needs and thus foster or undermine sustained engagement and either positive or negative well-being outcomes for players*" (Przybylski, Rigby, & Ryan, 2010). They start from a historical standpoint in which they relates to the first game arcade games that were focused on competence (in which it was critical to balance the challenge as under challenging games would lead to boredom, and over challenging games would lead to frustration), over to the home-consoles in which games also began to focus on autonomy. The 'Relatedness' component of the SDT is argued as always having an important part in video gaming, where friends would go to the arcade together, and when the consoles came they were able to play together in the comfort of the home. The authors further argue that beyond the CAR components, games also create the need for 'mastery of controls'.

In the source the aforementioned violent video games was looked into. This lead to the findings that it is more aggressive people that prefer graphical violent content and when video games spikes player aggression this is related to competence-thwarting (i.e. the aggression is based on psychological need-frustration). The results furthermore showed that violence in videogames (on average) is not a motivational factor for play. Violence in video games was shown to be "*a weak and unreliable motivator of play or source of enjoyment*" (Przybylski, Rigby, & Ryan, 2010) even among aggressive players, where it was more likely to be unrelated or have the effect of making a game less appealing.

Beyond this, the source also takes on the topic of immersion, where their take on it involves branching immersion into three subcomponents: physical presence – the feeling that one is actually in the game world, emotional presence – feeling an emotional weight as related to events in the game and narrative presence – being personal invested and engaged in the story of the game. In relation to this, the results from this source suggest that "*the major predictor of presence is the degree to which games satisfy motivational needs*". They further argue from the results that immersion can be a key effect in amplifying effects of virtual content in relation to goals and decision making.

2.1.2.2.1 Critique of the source

I am inclined to agree with everything this source states, and as such has no criticism for it. An addition I however can provide, in relation to the rejection of violent video games makes players violent, is that a new study published in the first quarter of 2017 (Szycik, Mohammadi, Münte, & te Wildt, 2017) supports this where they used fMRI on participants. The study used participants who

were excessive users of violent games and a control group that was matched in age and education. The fMRI scans showed no difference in brain responses between the two groups.

2.1.2.2.2 What to take away from the source

As this source supports the findings from the other SDT related study, there is not much new to add, as to what to take away. However, it can be stated that in relation to the findings, it has become more apparent that the controls for any game created for this project should attempt to not be difficult as to not create a large amount of frustration in participants. In relation to the source's inclusion of immersion, I will argue that this is something which should normally be included in studies revolving around gaming motivation. However, due to the limited scope of this project and the time, I will not use this topic as immersion is still a widely discussed topic where no largely agreed upon definition has been established within the academic world.

2.1.3 Continuation desire

As there are several sources which relates to this topic, I will in this subsection firstly present the sources and the related critique I have for them, and end this subsection with what I can take away from all of the CoDe related subjects as to not turn this subsection into a section with many repetitions. Furthermore, when the sources are overlapping in relation to the presented material, I will allow myself to simply reference to the previous source where it has already been explained, such that the review of the sources will not become too repetitive reading either.

2.1.3.1 The Player Engagement Process – An Exploration of Continuation Desire in Digital Games (Schoenau-Fog, 2011a)

This study sets out to imperially discover components that are associated with the desire to continue playing games.

The source argues that if a player's engagement is not sustained beyond the motivation for beginning to play a game, the player will simply stop playing it. As such it justifies the reason for investigating the topic of CoDe, where it uses grounded theory in order to "*develop a process oriented player engagement framework*" (Schoenau-Fog, 2011a). In this study, "*player engagement is understood as the level of continuation desire experienced in-game*" (ibid).

The results from this study were separated into four main components: 'Objectivities', 'Activities', 'Accomplishments' and 'Affects. As such the below model of continuation desire was created.
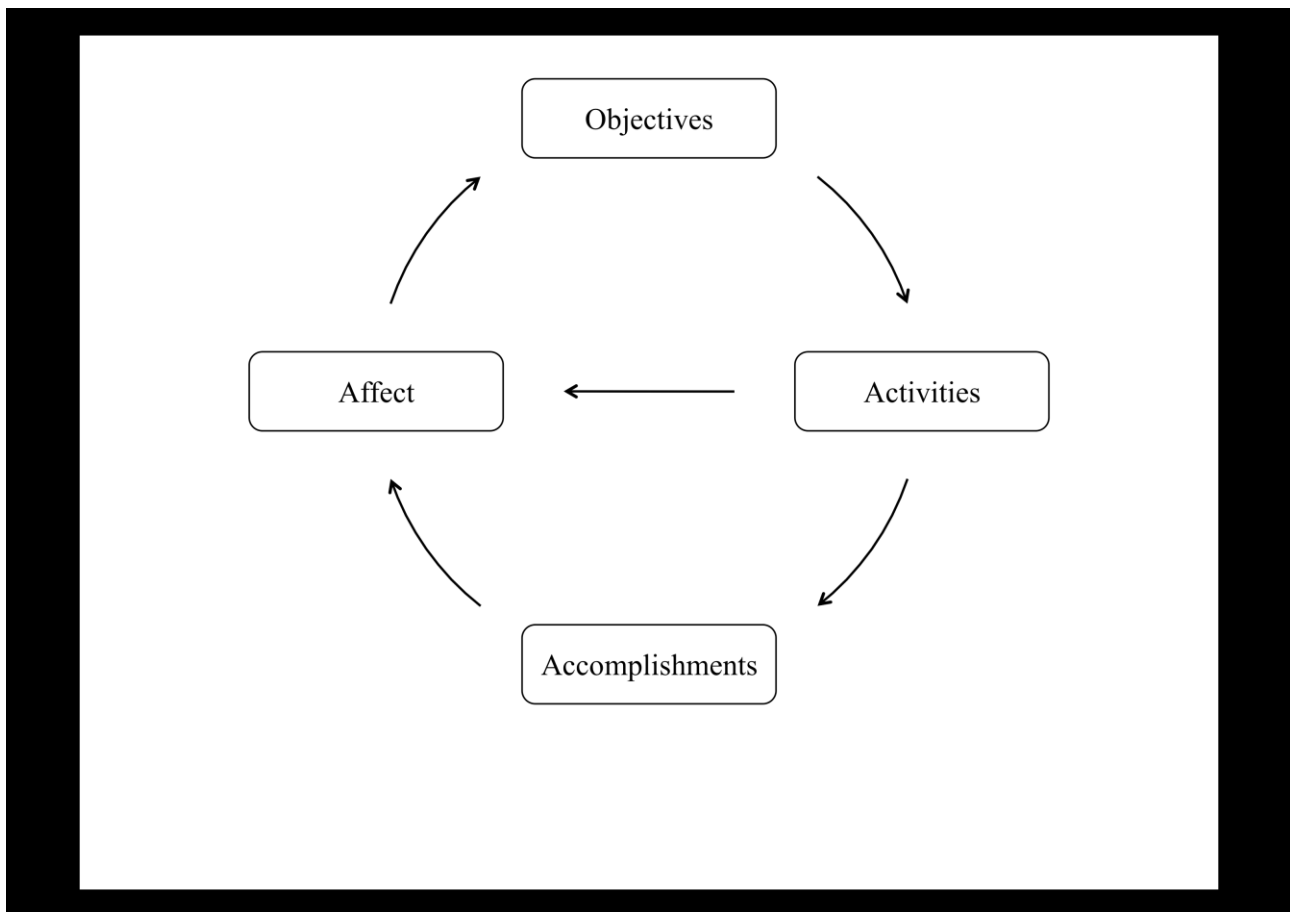
Figur 4 A model over the concept Continuation Desire as created by (Schoenau-Fog, 2011a)

The study reports player engagement described as a process with the following characteristics and relations between the identified components as presented in the model:

- A player begins playing through either game-related motivations (new interesting game) or personal motives (to find online friends)
- In the beginning the either the game sets an objective or the player makes a self-defined objective (Visit all locations)
- The objectives trigger activities the player can engage in
- An engaged player can have the desire to continue until the objective is reach, to experience accomplishment
- Players experience affect from performing an activity (relaxation, satisfaction, frustration)
- If the affect is experienced as positive, player engagement can be sustained and the cycle renewed.

In further specification, the objects of the model the following can be stated:

Objectives are game related triggers that can be extrinsic (quests) or intrinsic (I want this self-made goal to happen)
- Activities can be performed in/out of game and with mind/body with the following categories:

- Solving (puzzles, strategies)
- Sensing (wants to experience: music, visuals, atmospheres etc.
- Interfacing (How the gameplay is controlled e.g. voice input or body movement)
- Exploration (disengage if they HAVE to find something or the distance is too long)
- Experimentation (modify appearance, customize elements, different roles)
- Creation
- Destruction (this need to be varied)
- Experiencing the story (what happens next)
- Experiencing the characters
- Socializing (sharing experiences, compete)
- Accomplishments is what happens when you complete an objective
  Achievements
- Progression, not too repetitive (better equipment, level up, improve abilities, scores)
- Completion (also related to closure)
  Affect
- Positive affect (enjoyment, fulfillment, success, curiosity, relief etc.)
- Negative affect (boring, frustrating, not logical, too simple, anger)
- Absorption (flow, immersion and presence)

An important part of the CoDe sources aspect is the subject 'Affect'. In the source it is related to the feelings generated by the 'Activities' subject and the subject of 'Accomplishments' (Figur 4). The 'Affect' is described as having three different emotional states: positive, negative and absorption.

The positive 'Affect' can drive a players CoDe and is described as being "*an important category of engagement, as the respondents include a variety of positive emotions in their responses: enjoyment, fulfillment, success, victorious, excitement, curiosity, anticipation, surprise, satisfaction, relaxation, relief, empathy, the feeling of fun (e.g. through humor), suspense, [and] tension*" (Schoenau-Fog, 2011a).

The negative 'Affect' however, is seen as mainly a source of disengagement and can be related to a game that "*is uninteresting, boring, frustrating, dissatisfying, not logical, too simple, meaningless, annoying, unforgiving, wastes the player's time, if it can be completed too quickly or is too time consuming and simply not fun [...] does not appeal to the respondent, are too mainstream, the wrong genre, or create too much time pressure*" (Schoenau-Fog, 2011a). It has to be mentioned, however, that the source also states that negative 'Affect' can also fuel the CoDe where a player may be frustrated/angry in relation to solving puzzles, which fuels the CoDe as the player explicitly wants to complete them.

The absorption 'Affect' is described as being a feeling which "*is related to the concepts of flow, immersion and presence*" (Schoenau-Fog, 2011a), and can be a fuel for a player's CoDe. It was also reported in this study that if a game lacked the ability to create immersion in a player this may lead to disengagement.

2.1.3.1.1 Critique of the source

I have no critique of this source.

2.1.3.2 Hooked! – Evaluating Engagement as Continuation Desire in Interactive Narratives (Schoenau-Fog, 2011b)

This source is interesting due to its use of what it names the 'Engagement Sample Questionnaire' (ESQ). The source uses the previous aspects as talked about in the previous source, where it utilizes the four components of 'Objectives', 'Activities', 'Accomplishments' and 'Affect', in order to create the questions for the ESQ, which was created as can be seen in Figur 5:

ESQ Part One: Demographics (gender, age, frequency and amount of playing, favourite game / genre)							
ESQ Part Two: Before the experience							
Q1. Please indicate below the extent to which you agree or disagree with this sentence: "I want to begin the experience" (to quantify the users Continuation Desire (CD))							
Disagree strongly	Disagree moderately	Disagree a little	Neither agree nor disagree	Agree a little	Agree moderately	Agree strongly	Other
Q2. "What makes you want/not want to begin?" (to identify the user's CD and objective)							
ESQ Part Tree: During the experience							
Q3. Please write the code which is written on the screen in the application: (identifying the latest event)							
Q4. Please indicate the extent to which you agree or disagree with this sentence: "I want to continue the experience now!" (Response options as in Q1)							
Q4. "What makes you want/not want to continue?" (to identify the source of the user's CD and objective)							
Q5. "What do you feel now?" (to indicate the user's affect)							
Q6. "What is happening in the experience?" (to explore the narrative generated by the user)							
Q7. "What do you want to do next?" (to identify the user's activity)							
Q8. "General comments concerning the experience so far" (technical, content)							
Q9. "Do you want to continue?" (yes/no) ("yes" resumes, "no" directs to the final part of the ESQ)							
ESQ Part Four: After the experience							
Q10. Please write the code which is written on the screen in the application: (identifying the latest event)							
Q11. Please indicate the extent to which you agree or disagree with this sentence: "I want to try again!" (Response options as in Q1)							
Q12, "What makes you want/not want to try again (in the application / experience)?"							
Q13. "What do you feel now?" (to indicate the user's affect)							
Q14. "What did you just experience?" (to explore the narrative generated by the user)							
Q15. "Why do you want/not want to try again?"							
Q16. "General comments concerning the experience" (technical, content)							
Q17. "How many minutes do you think you have spent in the experience?"							
Q18. Extra questions related to communication of the theme and learning outcomes, not used in this study							

Figur 5 The Engagement Sample Questionnaire (ESQ) as created in the study by (Schoenau-Fog, 2011b)

The conclusions from the study was in regards to intrusive testing methods and CoDe, where it was shown that all though presenting a questionnaire during gameplay can be considered as an intrusive method, it showed that such a method, nonetheless can be a usable way of testing, also in relation to CoDe.

2.1.3.2.1 Critique of the source

I have no critique of this source.

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2.1.3.4 Evaluation of Continuation Desire and an Iterative Game Development Method (Schoenau-Fog, Birke, & Reng, 2012)

This source researches the topic of using an intrusive method where players' CoDe was measured during play, and used the results as a way to direct iterations of a game created for the study.

The study used an altered version of the ESQ (as used by other sources above as well), as to interrupt players while playing and ask them how motivated they were in terms of continuing and why this was. During the study several iterations of the tested game was created, and the continuation desire of the players rose continuant between iterations except for one iteration. The iteration, in which CoDe dropped, was found to be due to an implementation problem. Upon fixing this the CoDe rose again. As such this source proposes the measurement of CoDe, and why people have it, as a toll which can be used to improve games, by determining where they succeed and fail.

2.1.3.4.1 Critique of the source

I have not critique of this study. It is a relative small study with valid sources and a valid approach to the problem specified by it.

2.1.3.5 What to take away

The study in which an iteration method was used on a game where participants' CoDe was measured as to ensure that iterations would not lose what made players wanting to continue, showed that CoDe can be an effective tool as to enhance games' abilities to create engagement across iterations. As such, if the project product has the opportunity to be iterated, if there is time available for it, this means that a measurement of players' CoDe and why they are motivated to continue, can be used in order to make better iterations. If not, this source only proves that CoDe can be a powerful tool to use when making games and testing them, such as to figure out what works and what does not work. Hence I will argue that CoDe should be used in the data collection method as to measure a games success (or failure).

In relation to creating a product for this project that can be tested, the element of 'Activities' (2.1.3.5 What to take away) can be used in the design process. Here the elements of the 'Activities' can help in creating aspects which people can engage in when participating in the experiment that will be created for this project. When designing from the 'Activities' element it will also be easier to correlate the results of the experiment with CoDe, as data to be gathered can be directly constructed in relation to the CoDe elements which will be further descried below.

One of the topics in the 'Activities' aspect of the CoDe model (Figur 4) is 'Solving'. In regards to this project this can be used when collecting data from the participants. 'Solving' includes the subject of challenge (which is a part of the flow theory analyzed later in this chapter), and as such it will make sense to try and find if a participant finds that their skills does not match the challenge provided by either being too high or too low in comparison. This knowledge can then be used to figure out if a participant's CoDe is diminished or enhanced when encountering the provided challenges. It can further be noted that even if a challenge supersedes a participant's skill, this may actually lead to an enhanced CoDe if the participant in question likes to be challenged, which also ties into the 'Affect'

aspect, where it was previously stated (2.1.3.5 What to take away) that frustration from 'Activities' could fuel CoDe.

For the topic of 'Sensing' in the 'Activities' aspect of the CoDe model (Figur 4) this can be used in this project in relation to which data to collect. As the 'Sensing' is a generator of CoDe for a player, it will be incorporated in the data collection method that the participants will be asked about this topic.

With regards to the 'Exploration' element of the CoDe, this can be used in the data collection, in order to see whether or not participants wants to explore, feels that there is enough to explore, or may even feel that there is too much to explore, where all of these different answers can be related to their feeling of CoDe. The 'Experimentation' element can have a similar effect, and as such I will also include this in the data collection. A similar situation occurs as in regards to 'Creation', 'Destruction', 'Experiencing the characters' and 'Experiencing the Story' where these are equally relevant for data collection.

In regards to the Accomplishments, I will argue that this may be more important than gathering data on the 'Activities' as this can directly have an impact on players' feelings, where these ultimately can make a player disengaged, which relates to the 'affect' aspect of the CoDe.

In relation to the 'Affect aspect of the CoDe model (Figur 4) this is described as being an important part of what can fuel or disengage a player's CoDe. As such it will make sense to include collection of data in this regard when creating the test. This should both be done in relation to find positive and negative emotions as well as asking to a participant's emotions in regards to 'Absorption'. As a further note on this, it may make more sense in this study to present the participants with selectable emotions as a reference to the positive and negative emotions described about the 'Affect' subject, as it should be easier to gather quantitative data on the matter. The described emotions from the source (Schoenau-Fog, 2011a) can then be used to design which types of emotional responses the participants can select from.

In the source (Schoenau-Fog, 2011a) other sources in relation to engagement was referenced, from which several of them had designed questionnaires in as to determine the engagement experience provided by games. The elements of these questionnaires (GEQ, iGEQ and the EQ) along with the ESQ from the sources (Schoenau-Fog, 2011b), (Schoenau-Fog, 2012) and (Schoenau-Fog, Birke, & Reng, 2012) will be used when creating the data collection method. As such I will choose the elements I find relevant for this project to include in what will most likely be a questionnaire presented for participants.

2.1.4 Flow theory
As stated in the motivation for this project, the experience of flow in games can contribute to a game's compelling nature. As such, the below sources on flow is analyzed, as to find element that can be used further in this project.

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2.1.4.1 The Concept of Flow (Nakamura & Csikszentmihalyi, 2002)

This chapter tries to describe the flow model (Figur 6) and how it and related constructs have been measured.
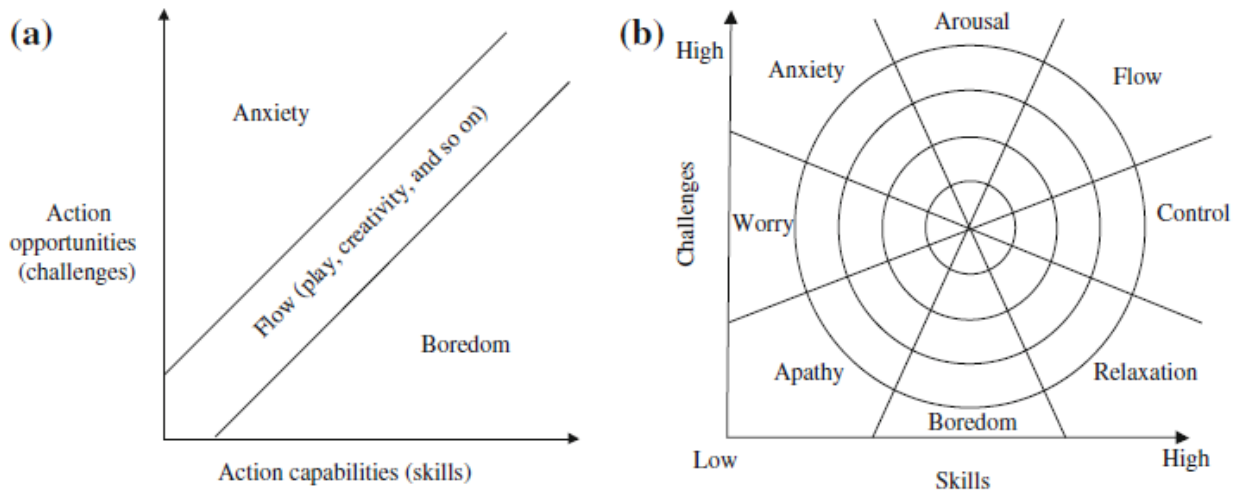
The research into flow is described from the perspective of wanting to understand intrinsic motivation as to where it becomes so intense, that a person can disregard physical unpleasantness such as hunger, fatigue and discomfort, although when finished with the task inciting this intrinsic state, can completely loose interest in what was made/completed.

In researching this phenomenon, it was discovered that this state was remarkably similar across play (e.g. chess) and work sessions. As such the conditions for flow was stated as being when

"• *Perceived challenges, or opportunities for action, that stretch (neither overmatching nor underutilizing) existing skills; a sense that one is engaging challenges at a level appropriate to one's capacities*
• *Clear proximal goals and immediate feedback about the progress that is being made.*"

"[...] *and one enters a subjective state with the following characteristics:*"

"• *Intense and focused concentration on what one is doing in the present moment*
• *Merging of action and awareness*
• *Loss of reflective self-consciousness (i.e., loss of awareness of oneself as a social actor)*
• *A sense that one can control one's actions; that is, a sense that one can in principle deal with the situation because one knows how to respond to whatever happens next*
• *Distortion of temporal experience (typically, a sense that time has passed faster than normal)*
• *Experience of the activity as intrinsically rewarding, such that often the end goal is just an excuse for the process.*"

"[But the balance for flow is fragile] *If challenges begin to exceed skills, one first becomes vigilant and then anxious; if skills begin to exceed challenges, one first relaxes and then becomes bored.*"

(Nakamura & Csikszentmihalyi, 2002)

The source further argues in lengths that flow is a subjective experience, where it argues that there cannot be some "*objectively defined body of information and set of challenges within the stream of the person's experience, but rather the information that is selectively attended to and the opportunities for action that are perceived*" (ibid).

For entering flow, the source argues that it is mostly related to attention both past and present, where the past can create interests which will guide it towards specific challenges, and that attention is needs to be held in order to sustain flow.

In this source, a previously made model of flow is being presented alongside a new model of flow. In these it can be seen how

2.1.4.1.1 Critique of the source
I have no negative arguments for this sources, it seems well defined, and many related sources presented are able to support the claims presented by the authors.

As a further note about the source stating that attention is needed in entering and sustaining flow. For this I will argue that it can be related with CoDe, where, as a minimum, attention of a player has to be kept by the game, in order to keep the player interested in it. As such, flow seems to be coincided with intrinsic motivation as discussed as a concept earlier.

5.1.4.1.2 What to take away from the source
In regards to attention, what can be gathered from this source, beyond participants being asked whether or not they have had an experience of flow, is the inclusion in regards to whether or not a person's attention is so engulfed in an experience that they lose their sense of time. This coincides well with the other sources information.

The arguments further presented in the source also states that flow stems from the subjective experience of challenge and skill. In regards to this it is clear that the perspective on Challenge, which has also been handle by some of the previous mentioned sources, is something that should be gathered data about, as to make sure that perceived challenge is not what could potentially be ruining a product made for this project.

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2.2 Player types

In this sub section I will firstly look at the Gamer Motivation Model (Yee, 2015), and the related interpretation of it, as to figure out how to best utilize it for this project. Secondly I will look into another research, as also presented on Quantic Foundry (Yee, 2016), which relates to the player types and their ages.

2.2.1 The Gamer Motivation Model (Yee, 2015)

The Gamer Motivation Model is comprised by 140.000 answers, which showed a baseline for six different types of primary motivation as to play video games, with two subtypes for each (Figur 7). The six different player types that are presented by the model is 'Action', 'Social', 'Mastery', 'Achievement', 'Immersion' and 'Creativity'. These have the following two subtypes: Destruction/Excitement, Competition/Community, Challenge/Strategy, Completion/Power, Fantasy/Story and Design/Discovery. The motivations of the subtypes are shown Table 1.

Figur 7 The Gamer Motivation Model as created by (Yee, 2015)

If people go to the website featuring this model, they can take a questionnaire which will tell how people are motivated for games as in relation to other persons who has taken the survey. This means that small adjustments can be made for this model, but as of the substantial amount of answers received, it appears unlikely that the baseline for the model will change.

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Table 1 The definitions of what each subtype enjoys as presented by the Gamer Motivation Model (Yee, 2015)

Action	
Destruction - Guns, Explosives, Chaos, Mayhem	Excitement - Fast-Paced, Action, Surprises, Thrills
This subtype enjoys being an agent of chaos and likes to blow things up just to see the destruction caused.	These types seeks adrenaline rush by being involved in fast-paced surprising gameplay.
Social	
Competition - Duels, Matches, High on Ranking	Community - Being on a team, chatting, interacting
These players are always being overtly combative, as some of them may only care about being acknowledged as the best "something" in a guild.	For this player, gaming is more about holding and sustaining a social network, as they enjoy working together for a common goal.
Mastery	
Challenge - Practice, high difficulty, challenges	Strategy - Thinking ahead, making decisions
These players want to play games that require high skill levels. They take pride in practicing to becoming better players.	This type seeks out gameplay that requires long time strategies, where they enjoy creating strategies, which can e.g. be related to balancing resources in a game.
Achievement	
Completion - Get all collectibles, complete all quests	Power - Powerful character, powerful equipment
These players want to complete all the content a game has.	These players have the motivation of getting the most powerful armor/weapon in order to be as powerful as possible in relation to the games world.
Immersion	
Fantasy - Being someone else, somewhere else	Story - Elaborate plots, interesting characters
These players enjoy the experience of being immersed in a game, and might just engage in exploration just for the sake of exploring.	These players need to have an elaborate storyline to delve into, with multidimensional character and interesting backstories.
Creativity	
Design - Expression, customization	Discovery - explorer, tinker, experiment
These players want to express their individuality in relation to the games they play, where they e.g. put many hours in character creation and customization.	This type of player can be related to the thought "what if" as they test out things in games, and often do not play games as they were intended to be played.

2.2.1.1 Critique of source

I largely agree with the created model, although I would argue that it may lack the feature of including the addition of 'Sensing' as described by the CoDe sources. It could be argued that the 'Sensing' may not be linked at large by the player types presented by the Gamer Motivational Model, but testing in relation to this will have to be done as to confirm or reject this.

2.2.1.2 What to take away from the source

In relation to this source the use of it is both in relation to designing a product, but also in designing the data gathering method.

As a test product should always attempt to be as controllable as possible, the primary motivators of the presented model in this source suggest that it would make sense to create six different experiences for the people who participate in this project. The different experiences made would

then be based on the inclusion of the secondary motivators, to make sure that the six different experiences should cater to both subtypes related to the primary motivators.

For the data gathering method, the information gathered from this source can be used to create questions in relation to how well an experience was directed at one player type. But questions in relation to improvements to a created experience could also be useful, as to see whether or not the other secondary motivators were successfully excluded from the experience. I.e. if a game is created for the primary type of 'Action', then if a participant, with the type of 'Mastery', wants more strategy included, it would suggest that the element of strategy, which is a secondary motivator, has at least been somewhat successfully kept out of the game. In relation to this if other participants with other primary motivator type then does not suggest that the game features too much strategy, it would then mean that the game was successful in either keeping this out of the game or only feature insignificant portions of it.

2.2.2 As Gamers Age, The Appeal of Competition Drops The Most. Strategy is The Most Age-Stable Motivation (Yee, 2016)

In this article it is discussed how gamers and their motivations apparently changes with age. The data sets were drawn from the same population, used for the Gamer Motivation Model, and as such have more than 140.000 data sets to draw from. In the article it is argued, and shown, that the elder a gamer is, the more their motivations drop. Men were shown to have a steeper drop than women, and as such the differences between women and men appears to shrink to almost no difference in some motivation groups, as the age increases. The only motivational type which was argued to be most stable, was the 'Strategy' motivation, which is one of the subtypes for the primary 'Mastery' type.

The source then counter argues its own findings, as it firstly states that the drop in motivation could relate to more responsibilities present for the older gamer generations. Secondly, and more importantly, it is also argued, that 'less' in this regards does not necessary coincide with ""*less" of a motivation*". It may simply imply that when rating low in excitement, this can relate to another specific kind of gameplay, namely stress-free gameplay.

2.2.2.1 Critique of the source

Due to the data presented, I cannot find any major critique points for the source. I will however ague, that gamers' age and how their player types are related to this, should be continuously updated. This is both in terms of investigating whether or not it will be continually supported, but also in terms of how the gamer generations of today might change the perspective presented.

In any case it is important to notice that when testing in this project, if there are going to be 'older' gamers as participants, the test results for these may be skewed as to them have a more unified motivational level.

2.2.2.2 What to take away from the source

As stated in the source, the more people age, the more their motivational drop is in the different categories. As I expect to gather data on participants' ages in this project, this information can be

used in relation to how to group participants by age. As it appears that there is a rather steep curve for the motivational drop in the younger years, where it appears to become more flat in the later years, it will make sense to construct age groups in which the younger participants is grouped by a shorter age span, than the elder participants.

As the elder gamers also appear to be "only" roughly the size of 25% of the gaming population (esa, 2015), this suggests that the elder generation of gamers is a less diverse structure than the younger gamers. I have to note here that in the future the amount of gamers in the 50+ group will most likely grow as todays gamers grow older, and as such it could be expected that the steep drop presented in the source may change. This, however, needs to be tested upon in the future as to either confirm the current drop as a consistent baseline, or reconstruct it.

2.3 FPS

In light of the above, the IPS can now be specified into a more suitable final problem statement as to investigate for the remaining of this project:

"*How can a test-framework be set up which can detect peoples game playing types and measure the level of continuation desire within said people to such a degree that the framework can help determine whether or not certain player types will enjoy a game or not?*"

2.4 Design requirements

The FPS specifies that a framework will be created in order to test the FPS. As such, the design requirements here will be in regards how to make a product onto which the framework can be applied.

As there are six primary player types specified by (Yee, 2015), a requirement for the product is that all these types should in some way be catered to. As such I have chosen to state the design requirement of creating six different games, one for each player type, where the gameplay for each of the six games should cater to both subtypes from a primary player type. As such it should be controllable as to test the applied test method created from the framework.

In further regards to these games, the components in relation to the SDT and the CoDe should be used when designing for the player types, as to try and establish a coherent gameplay that caters to one type across all the different sources in relation to compelling gameplay. This is how ever with the exception of the Flow Theory, which will mainly be used from a data gathering perspective.

As to not make this report too repetitive, the 'Design and implementation' chapter will become responsible as to specify in greater detail what the requirements for each game will be in relation to the above mentioned topic, before the actual design choices for each game will be made and implemented.

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2.5 Summary of the 'Analysis' chapter

In this chapter different sources were analyzed, which was in relation to why games are compelling, and what gamer type could be used for in this project. As such the FPS was specified as in relation to create a framework in this project. As such the framework designed for this project in order to test the FPS will be presented in its own individual chapter below, before the methods chapter is presented. The created framework will take the above finding in regards to how it is constructed, and will as such be used to create a test, for which the effectiveness of the framework can be tested.

Hence the design requirements stated that six games will be created as to try to correlate with player types, where the framework will be used on each game as to create a test to test the games, and an evaluation of the test method will be created as to figure out how successful the frameworks proposed method is.

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3 Creating the framework and test method

This chapter will present the designed model for the framework and explain the components and structure of it.

The model created for this project was designed from the perspective about testing games without the presence of any test personal. This was done from the perspective that players might be more comfortable when knowing that there is no-one looking over their shoulder while they play, which in turn could create better conditions as to experience elements such as flow. As such the model was designed (Figur 8).
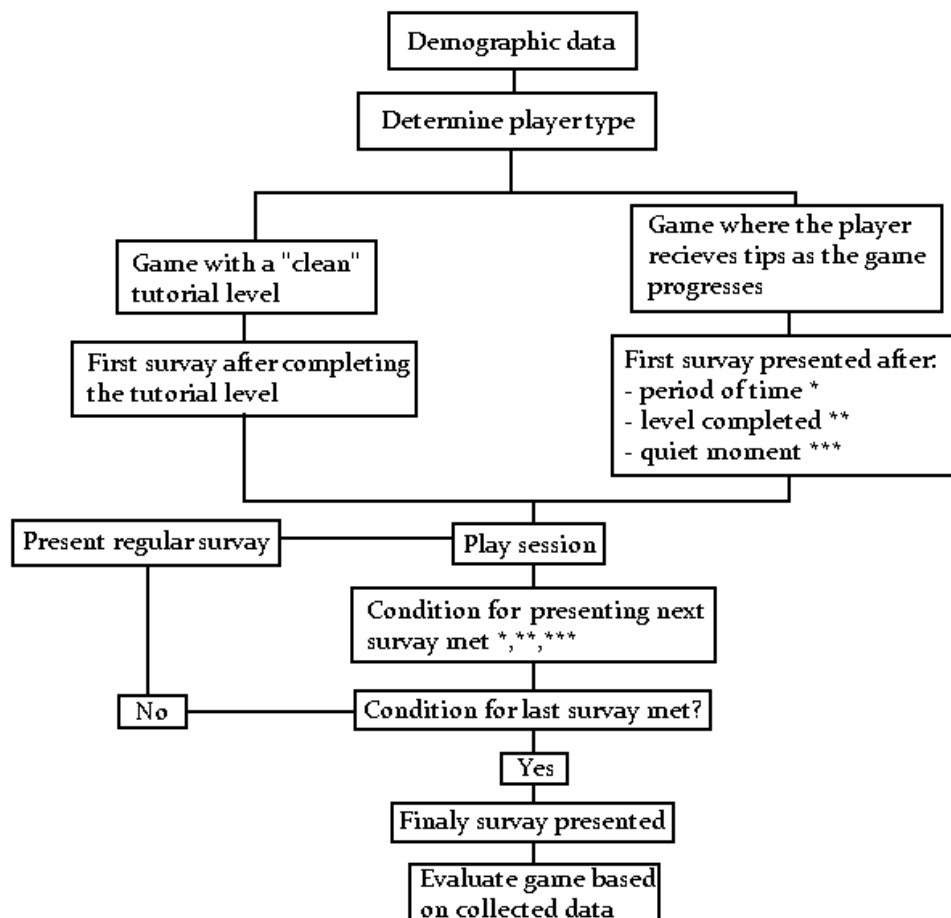
Figur 8 The created framework model 'Game Test Loop' (GaTeLo)

For the created model it has been designed from the perspective as an experience for a player. Firstly the player will be asked about demographic data (e.g. age, educational level) where he needs to give data as related to his player type. In relation to player type, this data can be collected as in regards to any method available for relaying this information, but for my project I have chosen that this model component should be decided in relation to the Gamer Motivation Model (Yee, 2015).

Hereafter there are two different scenarios which can take place, which is in relation to how the game is constructed. On the left side of the model is a scenario in which a game contains what I have

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named a 'clear' tutorial level. The referential meaning of this is when a game features a start with in a somewhat secure setting in which a player is given the opportunity to learn the controls featured in the game, but with no real penalties involved. An example of this can be found in the game "Call of Duty 4 Modern Warfare" (2017) which features a tutorial level in which the player finds him/herself at a military base where he/she is taught how to use the game controls and can practice on non-dangerous objects such as cardboard figures (Figur 9).

Figur 9 'Clean' tutorial level in "Call of Duty 4 Modern Warfare" (2017)

When a participant then has completed the tutorial level, he receives the first questionnaire. For the right side of the model however, here it is meant for games which does not feature such a 'clean' tutorial level, which most likely has the game presenting hints during the first parts of the game in relation with how to play it.

The right side of the model therefore jumps straight into the play session loop as opposed to the tutorial featuring games. As such, a player will receive the first questionnaire after one of three different conditions has been accomplished.

1) **The first condition is in regards to how long a game has been played**
    This method is suggested slow-paced games in which players can take their time when playing the game. This is when having games that are e.g. heavy story related, where the main part of the game is to experience a story. But this condition can also be used for games that may be fast-paced, but does not feature much variation in gameplay. Here I am thinking of e.g. "Pac Man"

(Pac-Man, 2017) where the gameplay cannot be related to as slow-paced, but it is rather static and unvaried.

2) The second is in relation to when a level has been completed
This condition is suggested to use in games that feature level completion, often in relation with puzzle solving (such as the game "thomas was alone" (Bithell, 2017)), where, or cooperation tasks to be completed or matches between players/groups of players.

3) The third is in relation to what can be named 'quite moments' in games
This condition is suggested to be used in relation to games that features fast-paced gameplays, and does not have much of level completion involved. An example of such games is e.g. (Fallout 3, 2008), where the player can both engage in fast-paced gameplay if they are overrun with enemies charging at them, but also be in more secure settings such as inside the in-game city of "Megaton". The reason for waiting for 'quite moments' in these games is from the perspective that it would create a high amount of annoyance within players should they be interrupted while they are fighting for their characters life.

After completing the first questionnaire, the framework model goes into a plays session loop, where the player will play the game until one of the three conditions are meet (regardless of whether or not a player entered the loop from the left or right side of the model) and be presented with a questionnaire. In order to break free from the play session loop of playing the game, reaching the condition, completing the questionnaire, and go back to playing the game again, the persons setting up the test has to decide when a player has sufficient knowledge about the game in order to enter the last questionnaire. When a player reaches this point in the game will depend entirely on the game and as such I can only generate the following guidelines for this decision:

For a game that features level completion, where there is no 'clean tutorial level' I will suggest that the last questionnaire should be presented when the player has gone through all levels that feature a new game mechanic, and has been allowed to test the three next levels with this knowledge.

For story heavy games I will suggest that the last questionnaire is presented when a player has experienced enough of the story to be able to somewhat accurately guess the ending.

For a fast-paced game with only few controls and game mechanics I will suggest an hour of playing the game (excluding the time spent on completing questionnaires).

For 'open world' games (which often has many game mechanics and controls to be experienced) I will suggest that a player should have discovered at least 80% of the actions they can make in the game, along with having roamed/discovered at least 50% of the environment.

For games relying heavily on strategy, I will suggest a two hour of playing time (excluding time used on filling out questionnaires).

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For game types not included in the above, I will suggest that a player should experience between 40-70% of a games content in order to reach the last questionnaire.

After taking the last questionnaire, the model features the extra step of evaluating the game based on the collected data. This should be pretty much self-evident as to why this step has been included.

As for my project an extra step will however be included, and that is an evaluation questionnaire as to what the participants think about the proposed test method by the framework, where I specifically want to gather information as to how intrusive and annoying it was perceived to be.

However, as I have not featured any specifics on my model as to what to ask players, these will need to be constructed on their own. For the questionnaires which will be designed, there needs to be four different types: A questionnaire for demographic data, the 'regular' and 'last' questionnaire from the model, and an evaluation questionnaire to evaluate the test method.

The demographic data questionnaire will be referred to as DQ1The second type of questionnaires, the 'regular' questionnaires, will be referred to as RQ2.
The third type of questionnaire, the 'last' questionnaire, will be referred to as LQ3 and
The evaluation questionnaire will be referred to as EQ4.

As they are a part of designing in relation to the framework, they will be created in the 'Design and implementation' chapter, where the knowledge gained in the 'Analysis' chapter will be used.

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4 Methods

In the above chapters the motivational grounds for this project was established, where after research was then selected and analyzed as in relation to the topics presented, leading to design requirements for the product to be created. This in terms lead to the above chapter presenting my framework for testing games, where further design requirements, in relation to the questionnaires that are going to be created, was made. As such, the following chapter will present a specification of how the test was planned to be carried out, and how the results from the test should be processed.

4.1 Test Procedure

For the test procedure of this project, I have chosen that I should have the least impact as possible. As such it was planned that the participants should be able to download a single file from the web, where this file would contain the questionnaires, the games and instructions on what to do. As questions may arise from participants which has not been accounted for, they will furthermore be given the information of my email as a mean of contact should the need arise. The participants will not be told as to what this project is about while testing for it. It has already been chosen that there should be made six different games for this project product, and as this might cause constraints on participants' time, the implementation of a save-system will be made, along with a pause button. This should make sure that if participants are interrupted in the test, they have the ability of leave it as is, and continue it later. There will be no forced structure as to which game the participants start playing, nor how they should select the following game to play. The participants will be given the freedom to select which ever game they wish and due to the save-system, they are also allowed to save a games process and try another game before coming back. They will however be required to play through the entirety of the games in relation to complete all available questionnaires for each game. The last questionnaire that will be presented to the participants will be the Evaluation Questionnaire (EQ4), which will be activated once the others have been completed. Once they have done this, they will be required to send their data results to me over email.

4.2 The results

The questionnaires which will be presented to the participants is planned to contain both quantitative and qualitative data. The questionnaires further have two different purposes: the DQ1, RQ2 and LQ3 will be used in relation to the created games in order to figure out what worked/did not work, and the EQ4 will be used in relation to evaluate the framework. As such the first three questionnaires' results will be used in correlation with the participants' player types as to how the games were able/unable to fit these. Hence, the quantitative results will be run through correlational methods (depending on whether or not the data is parametric or non-parametric) and grouped in relation to demographic data and player types. The qualitative data will on the other hand be processed by first running them through a content analysis in order to find correlational themes, where after they will be quantitatively gathered as to find common themes and less common themes reported by participants.

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5 Design and implementation

This chapter will go through the design and implementation process of both the games and the questionnaires.

5.1 Designing and implementing the non-specific part of the questionnaire

In this subsection I will design and formulate all the questionnaires, meaning the Demographic questionnaire (DQ1), the Regular questionnaire (RQ2), the Last questionnaire (LQ3) and the Evaluation questionnaire (EQ4). In designing these I have chosen that the last LQ3 will be a RQ2 with additional questions featured, as I have chosen that the LQ3 should not be featured when a game is over/won, but occur before that point. The reason for this is that I do not deem it necessary for my project that people need to complete the games created, as my main objective is to test my framework. This is not to say that I will not create some form of ending to a game, since participants may get frustrated if they want to complete the game and are unable to do so. The inspirational sources for the questionnaires, was stated previously, and I will incorporate the aspects of intrinsic/extrinsic motivation, SDT, CoDe, flow and player types in these questionnaires.

5.1.1 The exception

One specific part of the RQ2 will however not be featured here, but below in the sections covering each different game. This is the part that will concern itself with why the participants have the amount of CoDe they have. The reason for omitting that part here and describe it in the other subsections is that since six games are going to be created with an emphasis of each of their own player type, and as such, they need to be addressed individually, and here I find it logically to tie this up with the corresponding games.

In relation to this I have chosen to create statements which the participants can pick, instead of allowing for comments on why the participants rate their CoDe level as they did, because this will allow for a quantitative gathering. My other argument for doing this is that I want to know how their CoDe relates to the CoDe sources, and as such it should give more accurate data if I formulate statements in accordance with these. Furthermore I want to make sure that the participants consider all the aspects provided by the CoDe sources in relation to each game, where a person may not initially think of a given response, but select it if provided the option (e.g. a participant may like experiencing the characters, which is a part of the CoDe (Schoenau-Fog, 2012), but may not think about commenting on it). It has to be noted that I have chosen to create a positive and a negative statement for each subject I include statements on because I not only want to know what works, but also what does not work (e.g. the game allows for exploration, but the participant does not think that there is enough to explore, or they might think that there is too much to explore).

5.1.2 The demographic data

The DQ1 will be featured as the first questionnaire encountered by the participants, before allowing them access to playing the created games. For this questionnaire I have chosen to include the following:

Age

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Gender
Current occupation
Average playing time a week in hours
Country of origin and
Their player type data as handled by the website Quantic Foundry and their gamer profile tool.

These data will be used to group the participants in attempts to look for common ground, tendencies and trends.

5.1.2.1 About age
I have chosen to divide age into 9 different groups where all of the groups have an age span of 5 years, except the first and the last. The first group is for people 15 and below where I chose to have no lower limit from the perspective that people in this particular group is in strong development both mental and physical, and as such the other data gathered may provide a better type of grouping than the participants' age due to their rapid development. The last group is for people 50 and above as data shows that people above 50 makes roughly 25% of the playing population (esa, 2015), and that these elderly gamers are apparently more uniform in their gaming desires as already stated previously (2.2.2.2 What to take away from the source) than the younger gamers. The rest of the groups have been divided, as already stated with a 5 year span: 16-20, 21-25, 26-30, 31-35 etc.

5.1.2.2 About gender
Beyond the label Male and Female I have chosen to include the option of "Other", where a person can fill out specifics in this relation. The main reason is that should one of the few persons identifying as "other" actually take the test, they would not be put off by only having the option of selecting either Male or Female. The secondary reason for choosing to incorporate this is to sort out trolls (i.e. persons who specifically try to ruin the test results by answering dishonestly). As this question is one of the first to be featured in the DQ1, it will be relatively easy to spot people giving themselves the gender of "Attack Helicopter" or an equally silly term, which gives the option of discarding a response sooner rather than later.

5.1.2.3 About current occupation
This label will be filled out by the participant where examples will provide the participant with an idea of how to specify their situation. When grouping by occupation, I have chosen not to go into large detail (e.g. whether a participant is a taxi driver or a bus driver) in order to keep this grouping method simple and due to the fact that I aim to get 25~50 answers (ref), which could quickly render too many groups should the occupation be divided in detail.

5.1.2.4 About average playing hours per week
For this subject I have chosen to look at the past 6 months of average playing hours per week. I have furthermore chosen to divide average playing hours into four different groups: 0-14, 15-29, 30-44, 45+. These groups are based on the following assumptions: The first group play roughly a maximum of two hours per day on average and is suitable for people going to high school/university or working where the leisure time is limited. The second group plays an average between two and four hours a day and is suitable for people attending school where there is more leisure time as opposed to the
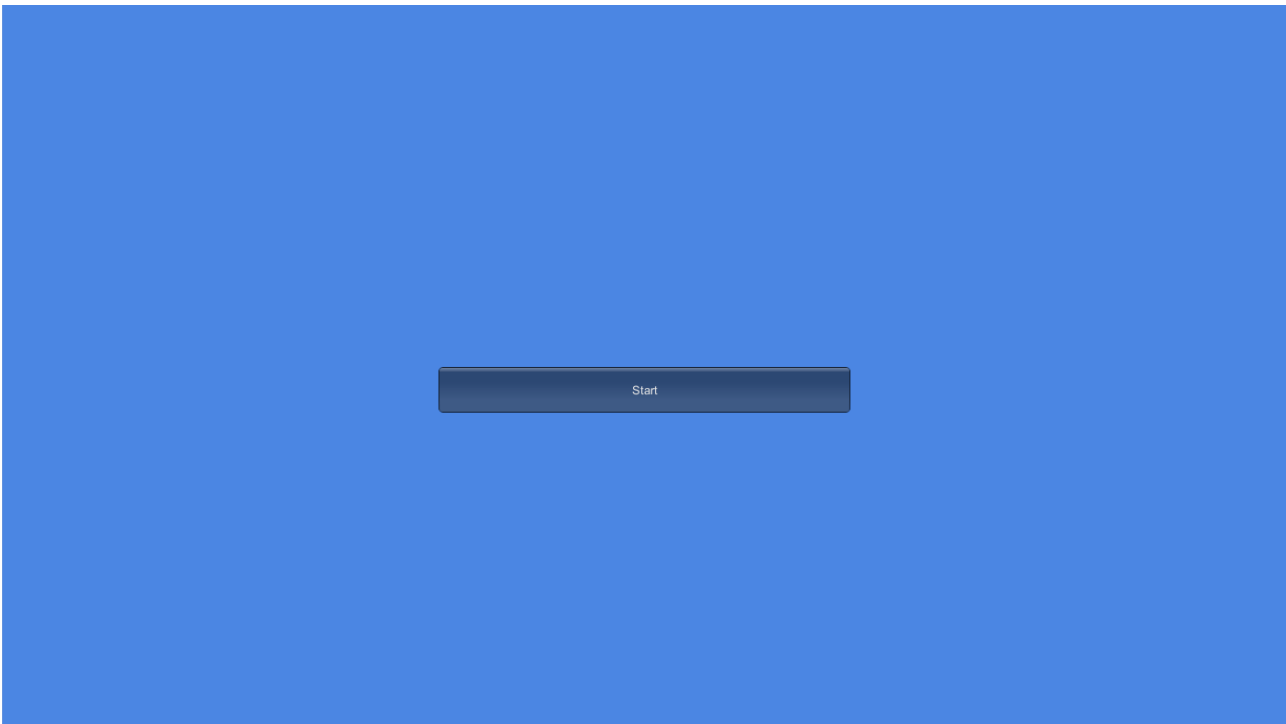
first group. The third group plays between four and six hours a day and is suitable for people not having a job, nor going to school. The last group is for those playing above 6 hours on average a day for which I have no assumptions about except that they might have a strong compulsion towards gaming. Naturally the types I assume for these playing groups can be mixed as to having participants in the first group being unemployed, but having such a rich life as to only have a maximum of two hours available a day to play games. However, in coming up with these groups assumptions had to be made as in regard to how to separate them based on average playing time, and this seemed like the most logical division.

5.1.2.5 About Player type

As already stated their player type will be determined by the use of the Quantic Foundry gamer profile tool (Yee, Quantic Foundry: Lab, 2017). In collecting these data the participant will be asked to rank order the percentile of their gamer profile and write from top to bottom starting with the primary motivation getting the highest percentile. E.g. if a participant scored the following: Action 30%, Social 43%, Mastery 19%, Achievement 86%, Creativity 20%, Immersion 5%, the rank ordering would be as follows: Achievement, Social, Action, Creativity, Mastery and Immersion.

5.1.3 Implementing the Demographic questionnaire

For the implementation of the DQ1, and consequently the rest of the questionnaires, I decided to use the GUI (Graphical User Interface) feature of UNITY (UNITY, 2017) creating a simple look which was fast to implement. The downside of this decision is if the GUI boxes and buttons are given a size which is calculated from the screen width and screen height, at which point a computer smaller than the computer used for implementing may not allow for big enough boxes and buttons that can show the entire text needed to be displayed. Another downside is that GUI boxes and buttons are semi-transparent, and as such a clear background is needed in order to make the text in the GUI boxes and buttons easily visible. Therefore I chose to add a UI (User Interface) image that is pure white as a background to the GUI boxes and buttons for the RQ2 and LQ3 to be displayed in-game, and a plain colored background using the incorporated camera features in UNITY for the DQ1. Another design choice I made about the GUI questionnaires was that when presenting a test participant with GUI buttons where they are meant to press one or several buttons to answer a question, a GUI box will show itself on the selected button in order to create a visual clue to what the participant has selected. Figur 10, Figur 11, Figur 12 and Figur 13 show the implemented result when running the created UNITY execution file.

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Figur 10 The first screen shown when running the UNITY file

Figur 11 The page presented after pressing start, where age, gender and occupation data is gathered

Figur 12 The third page shown, which will gather average gaming hours per week, nationality and the rank ordering of the six player types. As can be seen, a selected box will appear darker, which is an effect generated by adding a GUI box on top of the GUI button

Figur 13 The page shown when the data has been gathered. If a participant runs the UINTY file, but has to shut down after completing this page, upon running the UNITY file again, they will only be shown the page with the 'Start' button, and thereafter this page

Upon completing the DQ1 and reaching the above shown page with a button to "Proceed to menu" the participants data is saved in a binary file I named GameTestData.gd. I made the choice of implementing a save system using binary files as these files are not easily tampered with and they have a very small size as to not fill up much space in a computer's memory.

Naturally I have no intension of a participant filling out the same questionnaires several times so I furthermore implemented an array of Booleans to keep track of which questionnaires had already been presented and should not be presented again. As a precaution already at this point, I implemented the save system in such a way that all the test data would be gathered within the GameTestData.gd file, while each individual game got its own binary file to save to. This also ensures that if a game breaks, a participant can go and locate the game save file and delete it to reset the game, without having to re-do the questionnaires all over again. As a last precautionary action I implemented Booleans to keep track of whether or not an answer had been given, such that a participant cannot leave a questionnaire page before all the relevant Booleans have turned true, meaning that all necessary data have been gathered.

5.1.4 The regular questionnaire

For the RQ2 I have chosen to have as few commentary fields as possible in order to control the flow of data, and also make the regular RQ2 quicker to complete as I do not want the participants to loose motivation due to a large amount of time spent on these questionnaires. The LQ3 will however have more comment fields as this is the last opportunity the participant has to give information about the game. For the scales that will be presented in all my questionnaires (including the EQ4), I have decided to make them all a 1-10 scale. For the RQ2, I have chosen that it will feature the following:

A scale to indicate the participant's current CoDe
Selectable statements to indicate why the participant rated their CoDe as they did
A scale to indicate the participant's current feeling of relatedness
A scale to indicate how curious the participant is about how the game will progress
A scale to indicate how competent the participant feels and
Selectable statements about how easy the controls of the game are.

5.1.4.1 About the formulation of some of the questions

The formulation for two of the questions featured in the RQ2 was made with inspiration from the ESQ (Schoenau-Fog, 2011b), where some of the statements were formed with what can be called a strong edge. When creating statements this way I do so from the perspective that strong statements should make sure that when a participant agrees, they fully align with the statement. As such I formulated the question about CoDe this way: How motivated are you to continue on a scale from 1-10 where 1 is 'I am not motivated at all' and 10 is 'I have never been more motivated than now'. From this, if a participant chooses 10 they must be seriously invested in the game and have a really high CoDe drive. On the other hand if they rate it 1, then it is clear that they have no CoDe for the game which they are playing.

In the same manner I formulated the statement about curiosity for the games progress in the following way: Rate the following statement on a scale from 1-10 where 1 is 'not at all' and 10 is 'that is exactly how I feel!': "I am curious to see how the game progresses and I view this as a positive feeling". For this statement I considered the aspect of a participant might be curious about the game, but not really engaged in it, maybe even bored, at which point it could become a nuance for the participant that their curiosity makes them continue even though the game bores them. I take this approach from a personal perspective in which I sometimes have engaged in an experience because I was curious, but ultimately I did not enjoy the experience and got annoyed with my curiosity keeping me from leaving the experience.

5.1.4.2 About the statements concerning the game controls
In order to keep track of why a participant might feel competent or not, and also to see if the controls needs improvement to make a game better, I created four statements from which the participant can select one in order to indicate what they currently think of the controls. The four statements are as follows: Broken, Challenging, Easy and Intuitive. When collecting these data they will be translated accordingly to the numbers 1, 2, 3 and 4 in order to keep the data simple in the sense that the higher the number, the better the game is. I chose to only feature four different statements here as I find it logically that if controls are not easy they are challenging, and have their outer perimeters set by unplayable controls (broken) and controls which are so easy that they tend to disappear from a players mind during gameplay (intuitive).

In the collection of data on the controls I made an extra inclusion, where the first RQ2 of every game will feature a commentary field in which the participant can state why they find the controls challenging/broken. Commentaries made on this subject can then be used when looking at the competence feeling and should also be used to make the control easier which in turn should make a game more successful.

5.1.5 The last questionnaire
The LQ3 will, as already stated (5.1 Designing and implementing the non-specific part of the questionnaire) be a RQ2 with additional questions attached to it, along with several commentary fields in order to gather qualitative data. For the additional features in the LQ3 I have chosen the following data to be collected:

A scale to indicate the participant's feeling of autonomy
A scale to indicate how much they enjoyed the current game
A scale to indicate how challenging the game is (if the controls were perfect)
A scale to indicate how important it is for the current game to offer challenge
Question about whether or not they experienced flow
Question about whether or not they noticed time passing
Question about whether or not they experienced absorption
Selectable statements about the CoDe aspect of 'Affect'
Qualitative data in regards to the sensory/visuals the game offered

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Qualitative data in regards to both negative and positive things about the tasks/missions/challenges provided by the current game and finally
Qualitative data on how the current game could be improved in regards to the secondary motivators taken from the Quantic Foundry website (Yee, Quantic Foundry: Lab, 2017).

5.1.5.1 About the formulation of some of the questions

As was also the case with some of the questions featured in the RQ2, the ESQ was also used as inspiration for some of the questions added with the LQ3 from the same perspective that strong statements should make sure that when a participant agrees, they fully align with the statement. As such I formulated the question in regards to 'Autonomy' this way: "Rate to which degree you feel that the game allowed you freedom where 1 is 'this game does not allow me to experience any freedom/autonomy at all' and 10 is 'this game allows me all the freedom/autonomy I need". I formulated this question from the perspective that the amount of 'Autonomy' is based on a subjective perception, where the same game may render different feelings of 'Autonomy' for different people, as their psychological need for said element is expected to be different. As such it does not matter much how much freedom a game's developer intents to allow, but how it is experienced subjectively for a player. From the player type perspective it can arguably be stated that the same player types should regard the amount of perceived 'Autonomy' in a similar fashion, which should make the question adequate in detecting whether or not a game allows for the amount of freedom needed for a specific player type.

In the same manner the question relating to how much a participant enjoyed the played game is formulated like so: "On a scale from 1-10 how much did you enjoy the game where 1 is 'I hated it' and 10 is 'this is my new favorite game!'". Again this question has been given an edge that should ensure the participant to be more selective in which number they want to use for this, where a rating of 10 will mean that the game was a complete success in satisfying a participant. A rating of 8 or 9 will similarly mean that the game was well suited for a participant where the numbers of 5-7 will indicate a more moderate suited experience for the participant. Any number below 5 will mean that the game was not suited for a participant, where a rating of 1 would be a complete misfit.

In regards to asking a participant whether or not they experienced flow, it could be argued that this question was more suited for the RQ2 questionnaire. But the reason I chose to use this in the LQ3 instead, is from the perspective that I do not want them to focus on whether or not they experienced flow between the RQ2s, but whether or not they experienced it at all upon reaching the LQ3. This should ensure that they have experienced long enough gameplay for them to have the chance of experiencing flow.

Hence the explanation of flow is also included in the question, which should make it easier for participants to recall if they ever felt flow during the experience. As such the question is formulated with inspiration of the flow theory source ((Nakamura & Csikszentmihalyi, 2002)): "While engaging in any activity a person can sometimes reach what is known as a state of 'flow'. This state can be described to roughly have the following characteristics: experience of intense and focused

concentration, not being conscious about your own existence (e.g. not noticing hunger), time seems to go faster, the activity in itself is rewarding, your skill and the challenge provided is matching, you do not need to think about your response actions you are just performing them. Considering this description, do you recall that you at any one point this game were in a state of flow?".

5.1.5.2 About the question of absorption and sense of time

In regards to a topic which I have not brought forward previously, namely the topic of immersion, my original intension for not including this is that it is extremely extensive and goes beyond the scope I have set up for this project. However, a subject which is in relation to immersion is the feeling of absorption in relation to the CoDe aspect of 'Affect' (Schoenau-Fog, 2011a). When experiencing absorption it can be argued that a person is also feeling some level of immersion. Hence I have chosen to include a separate question about this in regards to the 'Affect' aspect, where I want the participant to try and recall whether or not they have experienced this. The description of what absorption is will be described as being a "mixture of immersion, flow and the feeling of in-game-presence". This may not be adequate if I wanted to test for actual immersion, but for this project the question is good enough to indicate whether or not a game was well enough made to draw in the attention and focus of a participant substantially enough for them to feel absorbed. Furthermore it is still related to the CoDe sources, and as such it can also be used in relation to a participant's CoDe.

In the same sense in regards to the absorption question, I chose to include a question about whether or not a participant noticed that time was passing. This is not only an indicator of how well a game can draw in a player, but also tells something about their CoDe. If they are not aware that time is passing while playing they should have a CoDe strong enough to keep the cycle of CoDe running. If they are, however, noticing that time is passing by, this means that the game is not sufficient enough to fuel the CoDe of a player.

5.1.5.3 About the questions regarding challenges and controls

In the RQ2 I chose to have the participants select how they feel about the controls as an indicator to use in relation to the 'Competence' element of the SDT. However, in relation to this I also want to gather information about how challenging they perceive the game should be. As such I want to give them the question that if the controls of the game were perfect, how much of a challenge they think the current game provides a player. This topic is also in alignment with the 'Activities' aspect of CoDe. As stated previously in the 'Analysis' chapter 'Solving' as part of 'Activities' is something that can motivate a player and fuel their CoDe. As such data on their perception of a game's challenge level can indicate if they e.g. find the game too challenging which could diminish their CoDe.

But in relation to this there is also the aspect about how much of a challenge a game should offer at all, in which one may argue that a game which purpose is e.g. to lay out a story for the player may not need to provide a high challenge. In such case it would also depend on the story being told where one could think of two different scenarios. One could be a horror game, where the player needs to figure out the story by gathering book pages guarded by monsters, and as the story progresses the book pages suddenly reveal that it was the player (or the person they are playing as)

who released all of these monsters, which then makes the encountered monsters a story element of the game. Another scenario could be that the developer of the game simply wants to mediate a linear story about a serious topic (such as the game "That Dragon, Cancer" (Green, et al., 2017)), where it is more important for the player to walk in the developers shoes, so to speak, rather than being focused on challenging gameplay. In any case, for the games that will be created, it will be interesting to see data in this regards, which from a business standpoint also could be used to tweak the game and its mechanics to better fit what sort of challenge their game should be expected to provide for players in order to substantiate their CoDe.

5.1.5.4 *About the questions relating to the CoDe elements 'Affect' and 'Sensory'*

For the gathering of a participant's felt 'Affect' during the game in relation to the CoDe aspect 'Activities' presented by the game, the source (Schoenau-Fog, 2011a) was used in order to select and order ten different selectable statements, in which five are positive and five are of negative 'Affect'. The creation of the ten words was based upon the statements in (ibid) made by respondents used in that study. There were initially more than five positive and negative statements presented in the source, however, some of them aligned to a similar emotion such as 'uninteresting' and 'boring', which can be argued as being quite similar.

Hence the statements in the source were reduced to the following ten words where I made the attempt of creating what could somewhat be referred to as antonyms (Positive/negative): Fun/Boring, Satisfying/Dissatisfying, Enjoyment/Annoying, Empathic/Meaningless, (positive) tension/Illogical. The last pair may not seem like antonyms, but was created from the perspective that if a player is engaged and feel tension in a positive manner, then the feeling of a game being illogical may create an emotional numbness as the player tries to figure out what is happening and how to play the game. Naturally the feeling of a game being illogical could also generate frustration, and in that perspective I will argue that frustration would be tension felt in a negative manner.

For the sensory questions it can be argued that they too should be part of the RQ2 instead of only the LQ3, but the reason that I chose to present this aspect here was that I want the participants to experience as much as the visual environment as possible, before commenting on it. All of these questions allows for a participant to make their own comments, as I regard this method better suited for a thing as subjective as the visual perception of a person.

I chose to have four different questions in relation to the visuals, where the first is concerned with the overall environment, such as to get an indicator of whether or not that type of environment suited a participant at all. The second question is in relation to the visual feedback/cues/clues that is featured in the game and the third is about the character's appearance. It has to be noted here, that in order to reduce the production time, the characters that will be featured in the games will be as simple as possible, where their appearances most likely will be made out of cubes and spheres. I still find that it is necessary to ask this question, as the design choice involving this might be a reason for participants to lose interest in the games if the characters does not allow for them to relate properly to the character they play as. The fourth question will simply ask the participant if they have other

comments in regards to the visual environment in order to catch any opinions not accounted for by the other three questions.

5.1.5.5 About the qualitative data for tasks/missions/challenges and improvement of a game

In order to gather information in relation to what can fuel a participant's CoDe in relation to the presented 'Activities' of a game, the participants will be asked to make positive and negative statements about these, which will be denounced as tasks/missions/challenges instead of 'Activities' in order to try and create a more suitable term for participants who cannot be expected to have studied CoDe. There will be two commentary fields, one for the positive and one for the negative as to make it easier to distinguish between upon reviewing the results after the test has finished. This data should reveal if some of the 'Activities' enhanced or diminished a participant's CoDe, which can in turn help to improve a game to feature more suitable 'Activities' for a given player type.

In terms of improvements of the game, the participants will be asked to consider the following aspects: destruction, fast paced gameplay, elaborate story, elaborate characters, quests, diverse environment, building features, strategy elements, opponents, upgrades and achievements. The participant is then asked in relation to these aspects how they could be used to improve the game both in regards to quantity and quality. The aspects suggested to the participant were mainly chosen by using the secondary motivational factors from (Yee, 2015). The reason for this is firstly that it is expected that participants with a different player type than what the game was targeting will choose to elaborate on improvements in relation to what they like (i.e. the secondary motivations). This should then prove that the game was successful in trying to avoid the game features which were related to that player type. The second aspect for this is to see what the participants with the targeted player type suggests, which will render data on how well suited the game was to satisfy the targeted player type. It has to be noted that the aspects that the participants are asked to consider does not include every item from the secondary motivational features, however this was due to an attempt to limit the amount of features the participants have to consider in order for them not to be exhausted by the amount of aspects. As a further note some of the secondary aspects, such as the 'Challenge' aspect has already been featured in the LQ3 elsewhere.

5.1.6 Implementing the regular and last questionnaire

When implementing the RQ2s and LQ3s the design choices about how they should look were already commented on in (5.1 Designing and implementing the non-specific part of the questionnaire). I chose to furthermore implement a page counter allowing participants to see how many pages they need to complete along with what page they are currently at, for no other reason than the perspective that participants may find it less annoying than not knowing the amount of questionnaire pages. A GUI button was implemented stating to save the current data at each page, and when the last data had been filled out and this button selected, a new button appears stating that it will save the answers. This was done to make it more clearly for participants that they had reached the end of the current questionnaire, and that this would save all their answers. For the LQ3, I also put in a GUI box telling the participants that this is the last questionnaire for that game, as I want the participant to know when they have completed the data gathering for a game, so that they can choose whether or not to continue playing upon finishing the LQ3.

In relation to when the RQ2s and the LQ3s should appear in a game, it makes more sense to describe this under the different games' subsections as it depends on how the games are designed. As such the only additional comments about coding I will make on the questionnaires is that the same Boolean array as describe earlier (5.1.3 Implementing the Demographic questionnaire will make sure that a questionnaire is only presented once, and that the same safe guards implemented were the same as described (ibid).

The following images (Figur 14, Figur 15, Figur 16, Figur 17, Figur 18 and Figur 19) will show how the questionnaires ended up looking where the example has been taken from the game targeted the 'Mastery' player type.

5.1.6.1 The RQ2

Figur 14 The first page of the RQ2, in which a participants' level of continuation desire and why they have this level is gathered, alogn with level of felt competence and percieved control difficulty felt by participants, and stat why they might be percieved as broken or challenging. As can be seen in the lower right corner, the button which is used to save the data also shows how many pages there is, and at which page the participant is currently at.

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Figur 15 The second page of the RQ2, where the participants' felt relatedness, if they have set a personal goal to complete and how curious about how the game will progress

5.1.6.2 The LQ3

Figur 16 This is the first page as shown to the participants upon reaching the LQ3, and as can be seen, it is identical to the RQ2 first page, with the exception of stating that it is the last questionnaire for a game - a GUI box which can be seen in the lower left corner

If the term 'relatedness' is defined as your need to feel important and/or connected with the world and persons around you (this includes virtual/game worlds and fictional/non-playable characters), rate on a scale from 1-10 how well this game suites your need for relatedness, where 1 is 'It does not satisfy my Need in any way' and 10 is 'It satifies my need for relatedness completley'

Have you set a personal goal which you want to complete in the game? yes No

Rate the following statement on a scale from 1-10 where 1 is 'not at all' and 10 is 'that is exactley how I feel':

I am curious to see how the game progresses, and I veiw this as a positive feeling

Imagine that you found the controls for this game easy/intuitive. How would you then regard the challenges provided by the game on a scale from 1-10 where 1 is 'way too easy' and 10 is 'too hard'

On a scale from 1-10 where 1 is 'not important at all' and 10 is 'extremely important', how important do you think it is that this game provides a serious challenge for its players to overcome?

Save current input data 2/4

!Last questionnaire for this game!

Figur 17 This is the second page of the LQ3, and here the difference between it ant the RQ2 begins to show. After the question about curiosity, the participant is now also asked how easy/hard the game is perceived, if the controls were easy/intuitive, and below it is asked how important it is that this game should give a serious challenge for a player to overcome.

Consider the tasks/missions/challenges which you experienced in this game, please state the ones you liked/saw positively on and write a short comment on why you liked them. If you did not enjoy any, simply write 'none' in the comment field.

Same as the question above, but this time about the tasks/missions/challenges you did not like.

In regards to you overall perception of the tasks/missions/challenges in the game please select the boxes below that correspons to how you think/feel about them

Clear

| Fun | Enjoyment | Satisfying | Empathic | (positive) Tension |
| Boring | Dissatifying | Annoying | Illogical | Meaningless |

Rate to which degree you feel that the game allowed you freedom where 1 is ' This game did to experience any freedom/atonomyat all and 10 is 'this game allow freedom/autonomy I need'

On a scale from 1-10 how much did you enjoy this game where 1 is 'I hated it' and 10 is 'This is my new favorite game!'

While you played, did you noticed time was passing? yes No

yes No

While engaging in any activity a person can sometimes reach what is known as a state of 'flow'. This state can be described to roughly have the following characteristics: experience of intense and focused concentration, not being conscious about your own existence (fx. not noticing hunger), time seems to go faster, the activity in itself is rewarding. your skill and the challenge provided is matching, you do not need to think about your response actions you are just performing them.

Considering the above description, do you recall that you at any one point in this game were in a state of flow?

Save current input data 3/4

!Last questionnaire for this game!

Figur 18 In this LQ3 page the participants are asked about their positive/negative views on 'Activities' provided by a game, where after they are asked to select which 'Affect' the 'Activities' provided to them. Following this is the

question concerning felt autonomy, where after data about the enjoyment of the game, sense of time and if flow was experienced is gathered.

Figur 19 As the last page of the LQ3, the data concerning participants' experience of absorption and 'Sensing' is gathered, where the LQ3 ends by asking how the game could be improved by in relation to the aspects presented in the GUI box. The button which previously stated 'save current input data 4/4' is then changed upon selection to the 'Save Answers' button, as to give the visual feedback clue to participants that this is the end of this questionnaire.

5.1.7 Designing the evaluation questionnaire

The EQ4 is, as already stated (3 Creating the framework and test method), the last questionnaire to be presented to participants, and it is the questionnaire which, as planned from the framework (3 Creating the framework and test method), is going to be used to evaluate the test. However, as the project product is going to feature six different games where player type is involved in making these, this questionnaire will also be used to gather data on whether or not the games was correctly targeting their own player types. As such I have chosen that the EQ4 will contain the following subjects:

Whether or not a participant was mostly intrinsic or extrinsic motivated
A scale to indicate how intrusive the test method was
A scale to indicate how annoying the test method was
Other comments on the test method
Which game the participant enjoyed the most
Which game the participant enjoyed the least and lastly
Which game the participant would like to play again

5.1.7.1 About the formulation of intrusiveness and annoyance questions

In relation to asking participants for how they regard the test in terms of intrusiveness and annoyance, I chose to create the questions for this in a more vivid explanation than previously created formulations. The inspiration was still in regards to the ESQ, but I chose their vividness from the perspective that I wanted to have the best possible way of interpreting their answers where the most negative rating can be interpreted as truly being an extreme. Hence I formulated the questions in this way: "On a scale from 1-10 where 1 is not intrusive at all and 10 is up in your face and screaming, how intrusive did you find this test method?", and the question about annoyance in this way: "On a scale from 1-10 where 1 is not annoying at all and 10 is having a mosquito in the ear, how annoying did you find this test method?". As can be seen from the formulations the negative explanatory statements are relatable from what can be a real life experience, and as such i will argue that if rated completely negative this should be taken as a serious indicator that the method I use should not at all be used again.

5.1.7.2 About intrinsic/extrinsic motivation and enjoyment and replay ability of the games

From the source about intrinsic/extrinsic motivation it has been stated that both of these types of motivations can exist at the same time. As such a participant can experience both types of motivations, from which I made the choice of asking participants whether they were most intrinsic motivated, or most extrinsic motivated during the test. The reason for asking this at the EQ4 is in order to see how the entire test was perceived by participants, where if the answers of mostly intrinsic motivation will suggest that the test method used would not feel too forced for the participants.

In regards to the three questions about the most/least enjoyable game and which game a participant would like to play again, this can be used to indicate whether or not a game was made correctly in targeting the right player type (e.g. a participant scoring high in the 'Achievement' type likes the 'Achievement' game the best) and whether the least enjoyed game resembles the least enjoyed type for a participant (e.g. a participant scored 10 in 'Mastery' as the lowest in the rank ordered player types and liked the 'Mastery' game the least). The replay ability for a game may not correlate with a participant's player type, but at least it should indicate the success of a game where replayability is a strong indicator for a good game.

5.1.8 Implementing the evaluation questionnaire

The implementation of the EQ4 is a fairly simple one. When all the other Booleans in the previously mentioned array has turned true but the last one, the EQ4 will be presented when a participant is returning to the menu. Due to the amount of questions it could furthermore be fit into one page instead of several. The Figur 20 shows how the EQ4 ended up looking.

Figur 20 The EQ4 only had one page, which gather the data on whether a participant was more intrinsic or more extrinsic motivated for the entire test, which game was most and least enjoyed, and which game a participant would like to play again, if any. After this data is collected on how intrusive and annoying the test method was perceived to be and if there are any additional comments to be made.

5.1.9 Implementing a way to extract the answers from the binary files

When creating binary files in order to safe guard the answers provided by test participants, naturally they need to be converted into something that can be read by humans and not only computers. The easiest solution to this was to implement that the custom C# class created to hold the answers was copied over in another 'Serializable' list, which was then saved as an XML file at the press of a GUI button. This means that the data can be retrieved by opening the XML file with programs such as 'Notepad'. It has to be noted that some previously made code had to be adjusted, where I had originally created 2D arrays (e.g. "*private int[,] myArray = new int[2,3]*" where this would create a matrix of 2 rows and 3 columns) I had to implement multiple 1D arrays instead, as XML serialization is not able to process multidimensional arrays. There were the option of transforming the multidimensional arrays into jagged arrays (e.g. private int[][] myArrayOfArrays), but as this method started off by giving compiler errors it was simply easier to do as described previously. In order for participants not to be able to create an XML file, I removed the GUI button (Figur 21) for the built product for the test, and only had the code being active in my own editorial version of the product.

Welcome and thank you for participating in my study. This is the game menu in which you can select what game to play. Please read this text in full before beginning the experiment.

When you play one of the games, you will frequently be interrupted by a questionnaire, at specific points. There is a certain amount of questionnaires for each game, and when you reach the last of a questionnaire in a game, it will let you know. Hence you do not need to complete every game at full in order to fill out all of the questionnaires.

When you have finished all the questionnaires, please locate the file "GameTestData.gd" by typing %appdata& in your computers search bar, which will let you access appdata-Roaming, from where you can backtrack to appdata-LocalLow-DefaultCompany-10th semester 2017 spring, in which the file is located. Send this file by email to LLRA12@student.aau.dk. Only responses that has completed all of the questionnaires will be taken into account(!)

The end date for accepting responses is Friday the 16th June 18.00 GTM-1.

Upon recieveing and accepting a response, you will be delivered you number for the participantion in the contest of 50£, unless you state that you will not participate in this contest. The payment will be transfered to the winners steam account, and if the winner does not have such an account, we'll figure out what to do. The winning number will be drawn Sunday 18th June and the winnier will be contacted directly.

Be aware that these games are not to compair with triple A games, nor an indie release. These games were made for the sole purpose of this test, and bugs will most likely occur. And I'd like to state an appology here, for the complete lack of music. I sadly did not have time to implement this. If you are on a lower end computer, you will experience lag. Some of the games taker longer to load than others, but have patience, it will load.

If you for some reason have to reset a game entierly because you made a bad save somewhere, you can locate the savefile for the game in the same folder as the GameTestData.gd, where you can delete said savefile. The names of the files will match up with the game's name as displayed on the buttons below. Deleting a game savefile does not mean that you have to fill out the questionnaires you already completed. However, should you delete the GameTestData.gd file, then all your answers are lost and will have to be redone.

Any questions can be send to the above mentioned email..

General: any game (except the "Defend your castle" game) has a working savefunction, and it, and the return to this menu can be reached by pressing ESC while playing one of the games. It also functions as a "pause" button. For the game "Maze flyer" you need to have a co-player present.

"The cursed land" hint: The game has more than one ending
"Simulation explorer" hints: 1) top of the world, 2) cave diving, 3) standing on the shoulders of others, 4) keep your hand on the right wall

| Mercenary | Maze Flyer | Defend your castle | Submarine adventurer | The cursed land | Simulation explorer |

Figur 21 This page is referred to as the main game menu, in which the different games can be accessed on the lower bottom buttons. A quit button was implemented here as to allow for closing the application. In the red square, the button for activating the creating an XML file is seen. This button was only featured in the editorial version of the project product, and does not appear on the product version made available for participants. The background text in this image simply tells the participants about the test method, how they can enter a contest when returning the results, and where to find the results, how to contact me, and some hints for the 'Creativity' game, as to make it quicker to complete.

Hence, when converting test data from a participant to XML, their GameTestData.gd file has to be put into the folder from which UNITY put in saves, and retrieves these again for loading up (Figur 22), where after the editorial version of the product can be run in order to use the GUI button.

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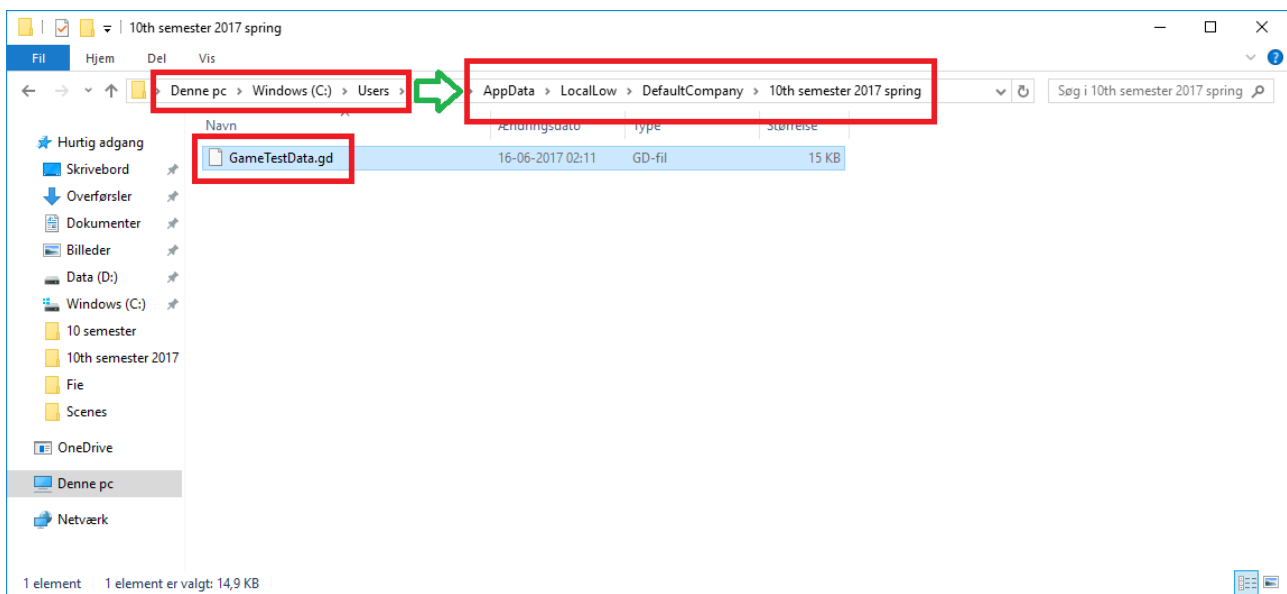
Figur 22 When the game is saved, the save file can be found in a folder as exampled on this image, where the folder can be accessed by searching for %appdata% and navigate to LocalLow - DefaultCompany - (name of UNITY project)

The created XML file and the GameTestData.gd file will then have to be removed from the save folder in order for them to not be overwritten by the next data set. In order to make the data easy to structure upon reviewing the received answers, the program "OpenOffice Calc" will be used, where one can select how inserted data should be split up in cells (Figur 23), which means that the "<" and ">" which is a part of the XML file (see Figur 24 for example) can be used for this.

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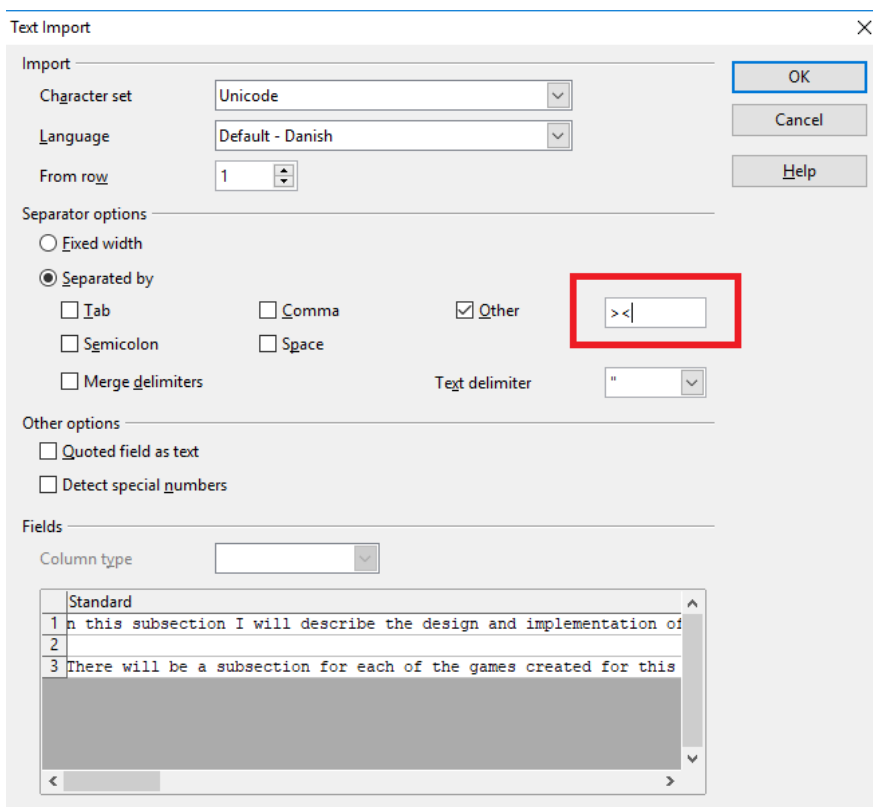
Figur 23 Dialogue box from "OpenOffice Calc" which lets the user select how copied content should be handled, where my example features the division of the content by the signs < and >

Figur 24 This is a cutout from an example dataset created for the purpose of showing how < and > can be used to separate the data from the XML file.

As such, the questionnaires (with the exception of the statements for why a participant rated their CoDe as they did and how many and where the RQ2s and LQ3s should be presented) and the retrieving of their data were completed, which leads to the next subsections in which design and implementation of the games created for this project will be described.

5.2 Designing and implementing the games

In this subsection I will describe the design and implementation of each game, along with describing the adaptation of the questionnaires into the games. I have chosen to that the games will be implemented using the game engine UNITY 5 (UNITY, 2017). In relation to the questionnaires, this is also the subsections, as referred to earlier (5.1.1 The exception) in which it will be described what selectable statements participants will be able to choose from as to state why they rated their CoDe as they did. There will be a subsection for each of the games created for this project and they will be structured in the following way:

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Designing the game -
1) Firstly the Gamer Motivation Model will be used to construct a loose idea of what the game should feature in order to accommodate a certain player type.
2) Then the SDT will be used on order to design adaptations to the game in order to try and design for participants to have their psychological need satisfactions fulfilled when playing the game. For this I have to note however, that although the 'Autonomy' component of the SDT is normally related to as the "*sense of volition or willingness when doing a task*" (Ryan, Rigby, & Przybylski, 2006), I will use this component in terms of perceived freedom provided by the game.
3) Hereafter the elements of the CoDe model (ref) will be used in order to further specify the 'Activities' that should be used in the game.
4) The above three points will then have made way for the specified design and further design choices presented hereafter.

Implementing the game -
1) After the game has been designed by following the above four points, the description of how the game was implemented will then be presented, where aesthetic choices will be presented, and important game mechanics will be described with as few code terms as possible in an attempt to create an understanding of game mechanics without becoming too technical.

Adaptation of the questionnaires (RQ2s and LQ3s) -
1) After the design of a game and how it was implemented has been described, the following will firstly describe how the selectable statements, for why a participant chose to rate their CoDe as they did, was formulated. When two or more games needs to feature statements about the same, the statements will simply be the same (e.g. if two games features the possibility for exploration, the statements relating to this will be the same for both games)
2) After this the choices as to when a RQ2/LQ3 will be activated for a participant will be presented. The main argument for when these are going to be presented is in relation to how much of the game a participant is expected to have experienced when being presented with a questionnaire. This also means that it will not be attempted to keep the amount of questionnaires the same for every game.

I have to note before proceeding with the description of the games that the individual games will be given a title instead of just stating that they are e.g. an 'Action' game. This is done from the perspective that a participant should not go into a game thinking that the game with the bias of thinking that said game would be the best suitable match as to their player type. Hence the subsections names below will be constructed of which player type that game is targeted, along with what chosen name it was given in parenthesis. In relation to bias I also have to state that some participants may try to guess which games are targeted to them, but this I regard this as a better option rather than having them expect a game to fit (or not to fit) their player type. Hopefully they will be engulfed enough in the games in order for them not to care about which player type the game was meant for.

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5.2.1 The 'Action' game (Mercenary)

5.2.1.1 Designing the game

5.2.1.1.1 The Gamer Motivation Model aspect

For the primary player type of 'Action', the two subtypes of 'Destruction' and 'Excitement' are presented in the Gamer Motivation Model (Yee, 2015). The two subtypes were described as having the following preferential features: Chaos, destruction, mayhem, guns, explosives fast-paced and intense gameplay, rewards for rapid reaction time, surprises and thrills.

As such, this game will be designed as a first person shooter game, in which a participant will be granted the gameplay options for guns and explosives, many enemies to ensure a fast-paced gameplay and an environment that is destroyable. As to the preferential features of rapid reaction time and surprises, the first can simply be accommodated by the amount of enemies where a rapid reaction time will ensure survival and possibly a large amount of dead enemies, and as for surprises, this can be included both in the relation of the destroyable environment, but also by the use of quests in the game. In relation to thrills this is a bit harder to design for, as it is more a requirement of the other parts of the game to fit together in order to provide a situation in the game that can give the emotionally response of thrills. I will argue here that if the fast-paced gameplay and destruction elements of the game are executed correctly, thrills will be possible to be experienced by a player.

5.2.1.1.2 The Self-Determination Theory aspect

For the SDT elements CAR, a game with fast-paced gameplay and destruction should allow for an easy obtainable 'Competence' feeling for a participant as the player type 'Action' would be expected to have the desire of getting on with the game as fast as possible. Hence, this game will feature a 'clean' tutorial level (as referred to in my framework 3 Creating the framework and test method) where a participant should quickly learn the game mechanics. For the 'Autonomy' component I will argue that for this game it should be sufficient to allow an 'Action' player type free movement in a 3D environment in which they have the ability to create destruction and chaos as they please. This is again referring back to the feature of a destroyable environment as already argued. For the 'Relatedness' element in this game it can be argued that it does not need much in term of an elaborate story in which players can immerse themselves or the like. But in relation to feeling important and relatable in regards to the game, non-aggressive characters will be created as a way for the players to relate to the game's world and to feature more destruction possibilities (e.g. destroying other characters' properties).

5.2.1.1.3 The Continuation Desire aspect

For the CoDe aspects of the model as presented by (Schoenau-Fog, 2012) the 'Activities' of 'Sensing' and 'Destruction' will be used to create the primary experience for the game. The 'Activities' element of 'Destruction' is somewhat self-explanatory as to the already made arguments about this game, however the 'Sensing' in this case is in relation to this, where it is expected that 'Action' type players are motivated by the visual features of destruction (i.e. what fun is there to blow something up if you cannot watch the explosion?). The secondary 'Activities' that will be used for this game is 'Solving Problems', 'Experiencing Story' and 'Experiencing Characters'. The 'Solving Problems' aspect will be

in relation to quests that allows for upgrading. The choice for involving the ability to upgrade is from the perspective that a player should be rewarded in terms of their progress in the game, although this should not at all be the main aspect of it as an 'Action game. The other two secondary points were selected since the non-aggressive characters needs some form of justification of being there and to make it easier to generate and ending of the game that would be more satisfying than just telling the player "*there is nothing more to destroy go play another game*".

5.2.1.1.4 The design choices

With the above points in place, the design of the game can now be specified. As for specific design choices, I have chosen that the players should have four different weapons: a small gun, a bigger gun, explosives and an instant-kill shield. As opposed to the other three types of weapons the shield will run on electricity, which means that the player needs to acquire power that is used over time in order to have it activated. This choice was made as I intend to make the shield a one-hit-kill, which means that if it is always activated the player would be extremely overpowered. As for purchasing ammunition and power, it will be featured that for the same amount of currency, the player can buy different amounts of ammunition where the less effective an ammunition type is, the more a player can get. As a further choice for the ammunition I have chosen that bullets should lose damage over time as to make them more effective when a player enters close combat, which should ensure that players are more willing to engage the enemies up close.

As to incite players with the initiative to upgrade, they will only be given the small gun to start with and a finite amount of ammunition for it, such that they have to frequent non-aggressive characters in order to purchase more ammunition and unlock the other weapons. In order to establish an easy to require currency used for buying ammunition, such that the players does not have to spend much time on this part of the game, I have chosen that wood-logs will be used for this. As such the environment needs to feature a substantial amount of trees in order to accommodate for purchases. In relation to this it means that there should be formulated four different quests. One in which the players' obtain an axe in order to cut down trees and gain logs, and one quest for each of the three locked weapon types.

There will be three types of enemies, with the exception of one enemy (which will be referred to as the fourth enemy) that will be used for an upgrade quest. These will each have a different amount of base health, and base damage that they can deal to the player. In order to level the playing field, the enemies will also have three different detection radiuses where the stronger and enemy is, the closer the players' character needs to be in order for the enemy to attack. The enemies will be of what is known as 'melee' types, which means that they do not have any weapons, but that they will do damage upon impact with the players' character.

For the story element of the game I have chosen the following simple storyline to present to the players: You are a bred soldier whose only goal is to solve the 'problems' you are presented by your superiors. The soldier is sent to a valley which is overrun by bandits who seeks to destroy the villages and villagers present in the area, and it is the soldier's job to eliminate all present bandits. As the

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game will feature a tutorial level, this will be used to mediate the storyline through the superiors of the soldier. The tone set by the mediated story should be of a lighter nature and will not feature much of a sub ordinary story that needs to be uncovered as the story element is not the important aspect of this game.

The quests designed for the game will be as follows:

Unlocking the ability to buy from villagers:
A villager, who is also a shopkeeper, will ask the player to cut 30 logs as this is much used by him and his merchant brothers. He will provide the player with an axe to cut down trees. Upon returning to him with 30 logs his, and the other merchants' shops will be usable, and the player gets to keep the axe. The players are only capable of buying ammunition types from the shopkeeper in relation to which types of weapons they have unlocked. (As to not have the player running rampant with the axe, there will be a maximum amount of logs that can be carried around).

Unlocking the bigger gun:
A villager will ask the players if they can give them 200 normal bullets (ammunition for the smaller gun). The reason given is that the villager has been in an argument with the shopkeeper and is therefore not able to purchase bullets which he will use to shoot the crows destroying his crops. Upon giving him 200 bullets he will give the players a bigger gun which he has a spare one of.

Unlocking the explosives:
The explosives, which have been given the name 'boom boxes' for this game, can be unlocked by taking a quest from a crooked villager doing shady businesses. The villager will state that all the bandits are bad for business in terms of other villagers (who owes him money) fleeing the village he is currently in. As such he asks the player to help him state an example in another village where the villagers have not fled yet, in order to encourage them to pay up quicker. The example consists of the soldier blowing the house up that belongs to a villager owing him money. The players are then given only one 'boom box' in order to fix this, and to make the task a bit more difficult, they should not kill the targeted villager. If they complete the task without killing the villager they will both unlock the 'boom box' from the shopkeepers and be given 30 'boom boxes' from the crooked villager. If the villager is dead upon returning to the crooked villager the 'boom boxes' will be unlocked, but the players will not receive any additional boxes from the crooked villager.

Unlocking the shield
To unlock the shield, which will be called the 'energy shield' the player needs to take a quest from a villager, in which the objective is to kill the previously mentioned fourth enemy. This enemy will be given a substantial large size in comparison with all other enemies as to create the image of what could be called a boss-fight. It will in relation to this also have more health points and inflict more damage than the other enemies in the game. When the quest villager is then spoken to after the enemy is dead, this will unlock the possibility of buying 'power' for the energy shield from

shopkeepers, where it will be presented as amount of time the shield can be active, as opposed to e.g. the bullets which simply shows the amount of bullets that can be bought.

As there are four different quests, I have chosen to have the game world feature three villages, in which the first that can be approached will have the quests for unlocking the ability to use the shopkeepers, and the bigger gun. This village will be the most populated one, as to reference the quest in which it is described that villagers are otherwise fleeing from bandits. As such there will be one villager for every placed house. The second village that can be approached will have the quest in relation to the 'boom boxes', where the house needed to be blown up is located in the first village described. There will not be many villagers in this village as to not break the coherency of the game and the information provided by the crooked villager. For the third village, I have chosen that this should be overrun with enemies as to keep the coherency of the game, and as such the villager who will give the quest to kill the fourth enemy, is placed outside the village where the villagers have taken refuge. There will be a shopkeeper for each village in the game, as to not have the players run back and forth in order to purchase ammunition.

In relation to the characters featured in this game, I have chosen that they should all be cubes. The standard cube (Figur 25) in UNITY will be used for this. However, as a design choice in regards to 'Relatedness' I have chosen to equip the characters with faces. These will be a simple non-animated facial expression, where there will be an expression for when the character is alive, and one for when it is dead as to make it easy distinguishable whether or not a character is active. The character given to players, however, will not feature any facial features, as I have chosen to lock the position of the players' camera behind the soldier, and as such, they will never see the front in any case. As to distinguish the soldier character from the rest of the characters, it will not be visibly altered from the standard UNITY cube, with the exception of adding objects in relation to the four different weapons and the axe.
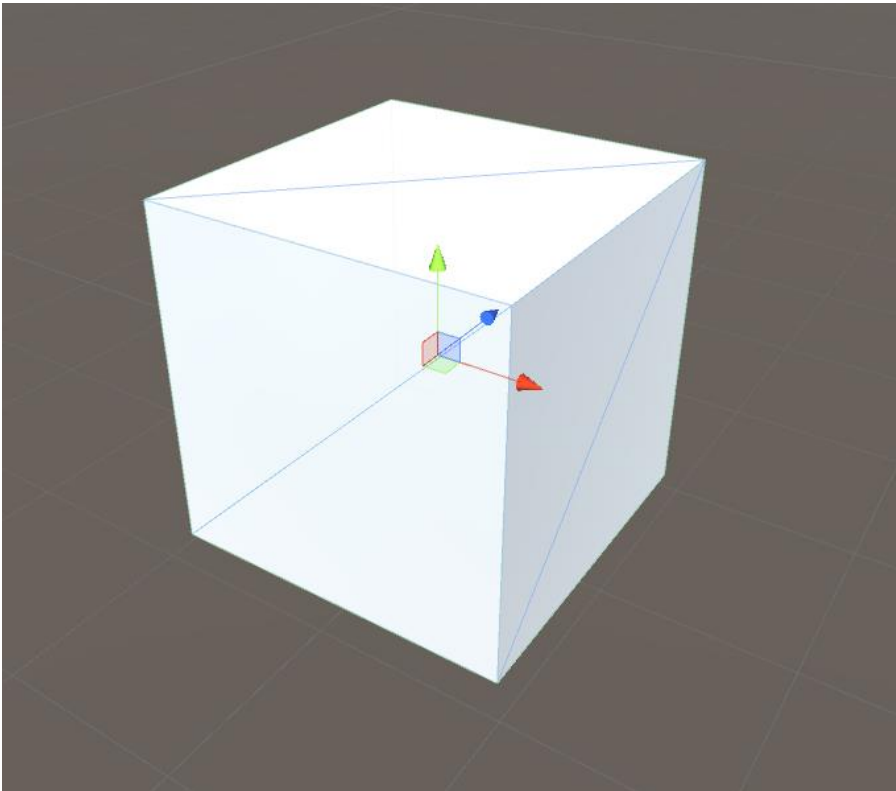
Figur 25 How the standard created cube in UNITY looks

The tutorial for the game will need to teach the player how to activate and use each of the weapons, and as such there will be four different parts, where each of the parts requires a different weapon for completion. As the players needs to practice aiming, each part will have two steps; one in which there are unmoving objects that can be eliminated, and one where there are moving objects that can be eliminated. I have chosen that there should only be three of each type as to not make the tutorial long. The players will first face the unmovable objects on which they can practice aiming at their own pace before facing the moving objects. The players will start using the small gun, then the bigger gun, then the 'boom boxes' and then the energy shield. As this is the tutorial level, the players will be provided with a large amount of ammunition, and no time limit on the use of the 'energy shield'.

5.2.1.2 Implementing the game

The graphical choices for the environment were chosen to be depicted as a squared design. As such everything in the game will be blocky in looks. On the pictures below it can be seen that the cliffs surrounding the environment is square and that the trees are squared as well. The environment was created with the intension of leading the player from one end of the map to the other, where they would be prompted to go through the villages. As such, it can be seen on Figur 26 that the road from the start point (marked with a red X) leads through the environment and all the villages, where the cliffs were used to block of the sides of the road.

Figur 26 This image is a screen capture of the mini-map as presented to the players, and shows how the environment for the 'Action' game was created, as seen from above. The lighter area on the map is a dirt road. The red X shows where the players will start after they have completed the tutorial level. The black, purple and light blue circles are markers of enemies, and the red dots are quest and shop villagers. The darker brown areas with green dots are fields with crops on.

The villagers and the bandits can be seen as being squares on Figur 27, a design choice already written about, to keep this look in coherency. As can be seen, they have been given two boxes, one for their face, and one to surround the face-box. This was done as UNITY uses a repetitive system for its standard cube, which means that the face-box actually has a face on each side of it. Hence it made sense to add an additional box in order to hide this. As to add a bit of life to the characters, they have different expressions for being alive and dead Figur 27. The villagers were furthermore added extra in-between facial expressions, as to state how close they are to dying Figur 27. This implementation choice was made from the perspective that if a player is not aware that his/her bullets will actually kill the villagers, the change in facial expressions should create a pretty strong indication that they do react to getting shot. An implementation feature in relation to the facial expression, which was

planned for but not included due to the project time limit, was that when the villagers lost enough health to reach the third expression, they would run away from the players' character. Furthermore it had also been planned that the villagers should run away from the bandits if these got to close to the towns, but this was also omitted due to time pressure.
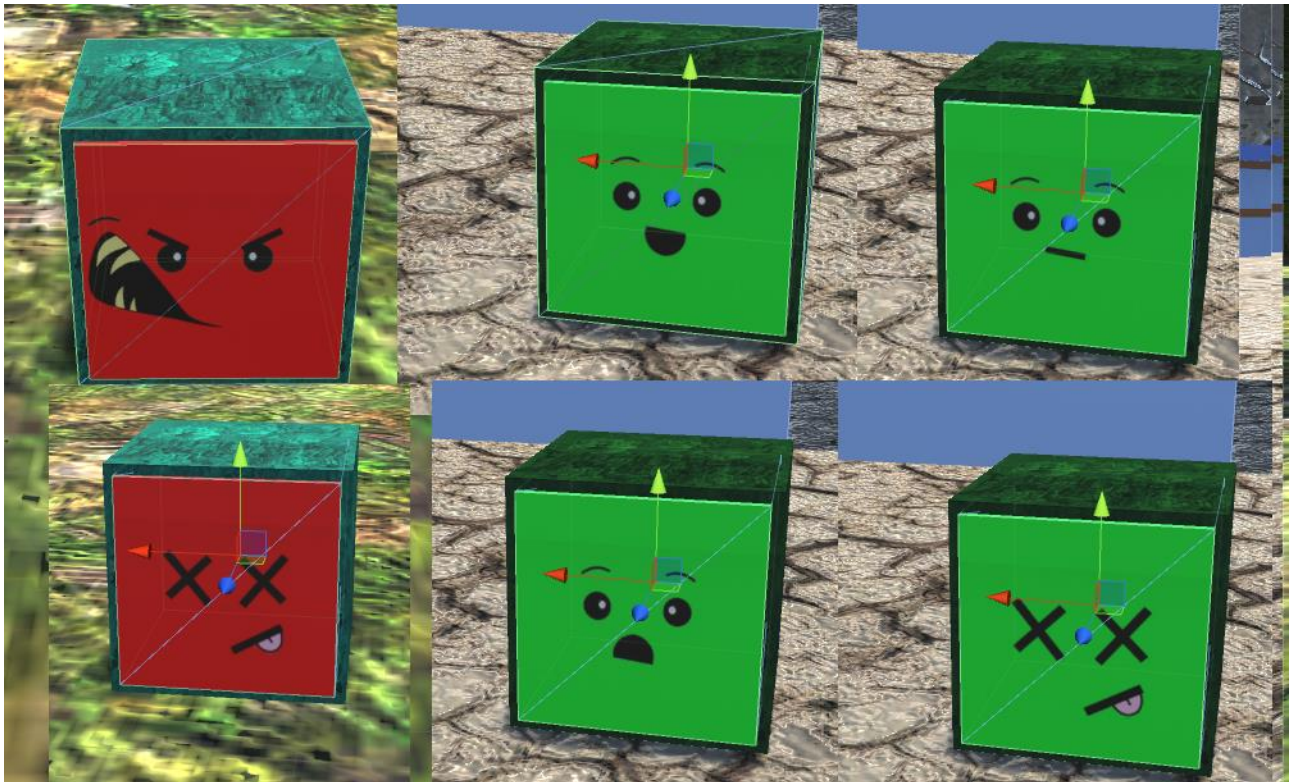
Figur 27 This image is screen capture of how the bandits and villagers came to look. The Bandits were given a 'living face' (top left) and a dead face (bottom left). The Villagers were given four different face expressions, where the happy face is shown when the villager's health is > 30, the lesser happy face (top right) is when their health is between 15 - 25, and below 15, but not dead, the bottom middle face expression is active.

A design choice described for this game was in relation to a destructible environment. As such the houses and trees, which can be seen on the above pictures, were made out of multiple smaller objects. This allows for a more chaos related destruction where these objects can be broken up into their smaller segments, than if these objects would just e.g. be portrayed to burn or just straight out disappear when players use e.g. explosives. As a further choice for the implementation I chose to create crop fields where the crops can equally be destroyed.

The crops can be seen on Figur 28. As the main model for these (I changes only the texture for the leaves) were downloaded through the UNITY Asset Store (2017) and were made of a very large amount of smaller objects, I chose to implement that if players use explosives near a crop, it will burn (the fire particle effect from the standard UNITY particles was used for this) and get the added physics that would allow it to fall over (Figur 28), where after it would disappear after the fire had burned for a while. For some reason the crop will not always disappear, but I chose to leave that bug behind as the feature of a toppled over crop can equally be regarded as a feature in favor of chaos.

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Figur 28 The crops with my custom texture on. The image also shows how it looks when explosives is used in too close proximity to a crop, where it will be set on fire and topple over

For the four different types of weapons, three can be seen active on Figur 29. The small gun and the bigger gun were both created as simple slim, long boxes. When activated they appear on the right side of the players' character. As to distinguish more easily between the two guns, the smaller one was made green while the bigger one was made grey. The bullets fired from both guns were composed of a capsule(s). The bigger gun fire more bullets for one shot while the smaller gun only fired one bullet for one shot. The 'boom boxes' as written about earlier, came to look as small boxes hold by the character on the right side as can be seen on Figur 29.
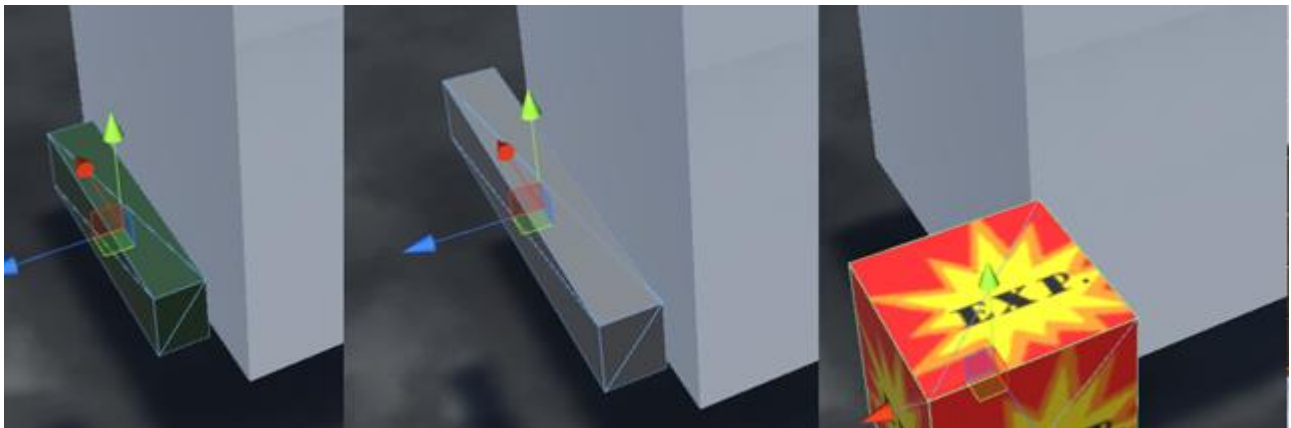
Figur 29 From left to right, the small gun, the bigger gun and a boom box. The character is viewed from the front, i.e. the weapons are displayed on the characters right side

When placed on the ground a flat square with a red transparent material applied (Figur 30) indicates their blast radius and also has the second purpose of being used to figure out where a player can stand in order to activate the explosive. When exploding, the box will disappear and the UNITY particle effect 'mobile explosion' will be instantiated and play once instead.

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Figur 30 Some boom boxes have been placed at the immobile targets in the tutorial level, where the red marker for detonation radius can be seen

The 'energy shield' was implemented as a flattened box (Figur 31) which rotates around the character when activated and was given the same material as the blast indicator for the boom boxes.
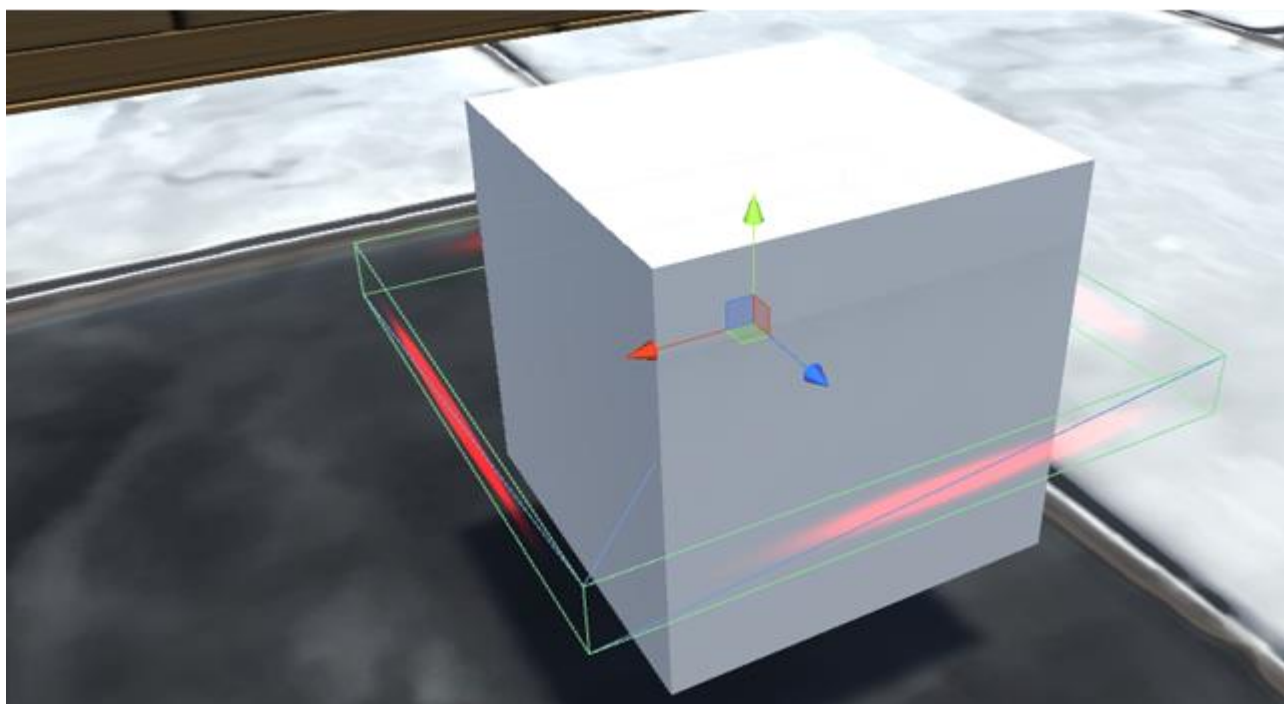
Figur 31 The energy shield marked in the UNITY editor as to make it easier to see that is is a flattened square with the red-transparent material on

A previously mentioned design choice for this game was that it should feature a tutorial level. As such, a small stage outside the gaming environment was created as can be seen on Figur 32. As can be seen there are four different hallways which each contains six white blocks. The block which is marked with a red square is the player's character. The white blocks are grouped in threes where this

correlates with the moving and non-moving targets as written about earlier. The players will start the game from this position and move through the hallways in an s-like pattern (marked with blue on Figur 32). To keep the players on track, the walls on the small stage were implemented to move away and reveal more of the hallways as players progress in the tutorial.
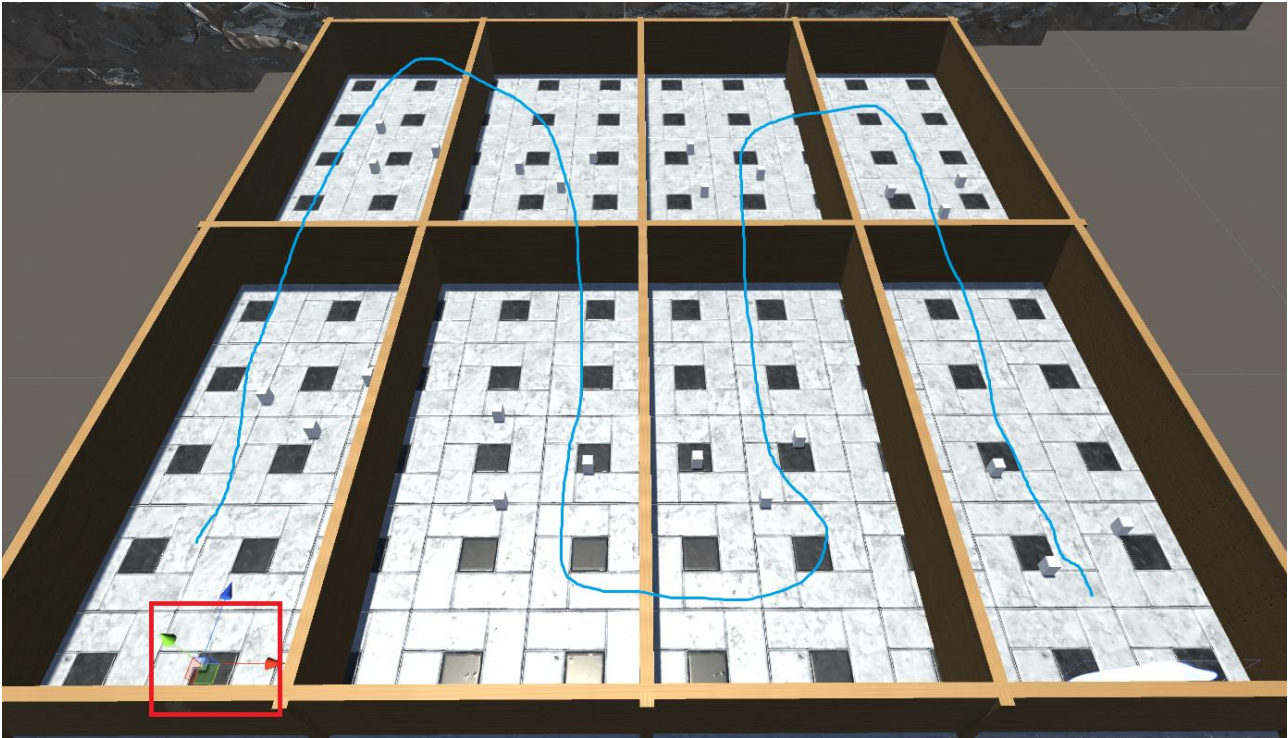
Figur 32 How the tutorial level looks from above. The red square marks the player, and the blue line marks the path the player will follow to complete the tutorial level

The tutorial features dialogue from a military character that is portrayed to be the players' character's superior, and the dialogue was implemented using the GUI system as can be seen on Figur 33. While the military character "talks", the movement form the players are removed as to not have them making trouble and have them focus on what is being said by the character. The tutorial will teach the player how to select a weapon and use it, where the players will be given a large amount of bullets and 'boom boxes' to use in the tutorial level, while the timer for the 'energy shield' has equally been removed, such as to be continually functioning.

In order to allow players the ability of keeping track of how much ammunition they have, a GUI box was furthermore implemented to be always featured up in the right corner of the screen (see Figur 33). Another implementation choice was to allow players to turn on and turn off the 'energy shield' in order to preserve the power for it. As a simplicity choice, whenever a player selected a weapon, the previously held weapon will be "stored away" (i.e. set inactive), and if the keyboard button 'F' is pressed, all weapons will be deactivated.

Figur 33 How the tutorial begins, where a 'military' character 'talks' to the players by GUI boxes (center of picture). In the upper right corner, the GUI box telling players how much ammunition they have left, can be seen. Also notable is the green health bar in the lower left corner, which indicates how much life left the player has. The life will be regained over time.

A secondary reason for implementing the 'F' key this way was that the same key could be used to trigger dialogue options with shopkeepers/quest villagers, without having to fear that players would accidentally shoot them, as they maneuvered around in the GUI interface created for this purpose (see Figur 34).
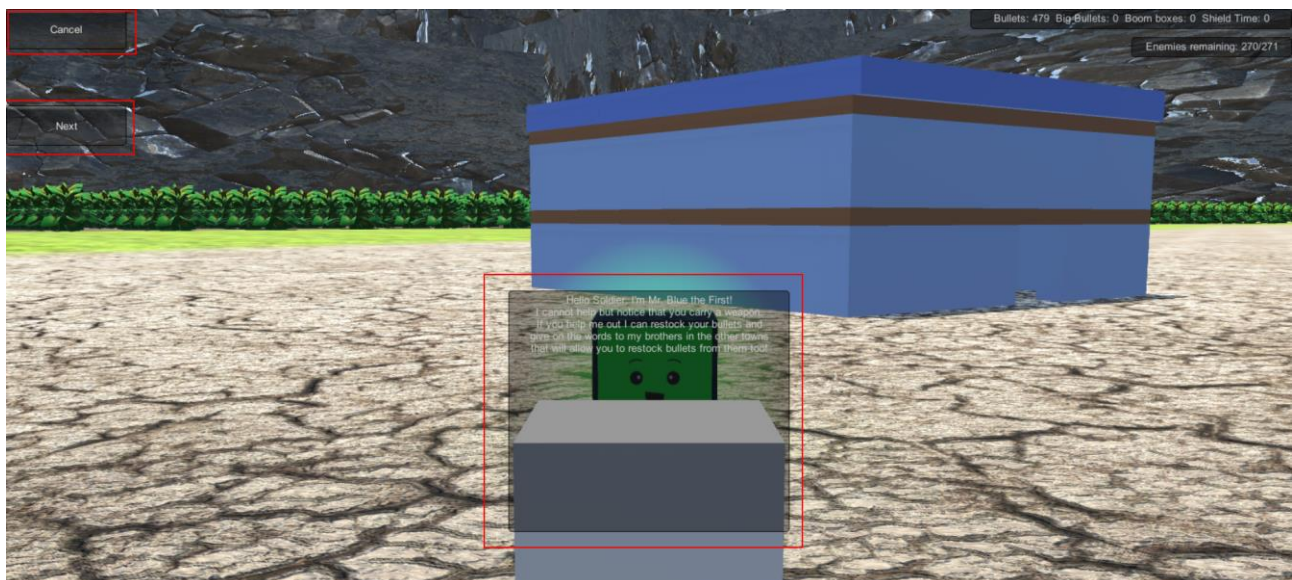
Figur 34 On this image the quest dialogue has been triggered. In the top left side, the buttons for viewing the next dialogue part, or cancel the dialogue is featured. The player will be given the option to accept the quest when reaching the last part of the dialogue.

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The quest villagers was furthermore added a light with the 'halo' component activated (see Figur 35), as to create a visible cue for players in relation to which villagers to approach for quests.
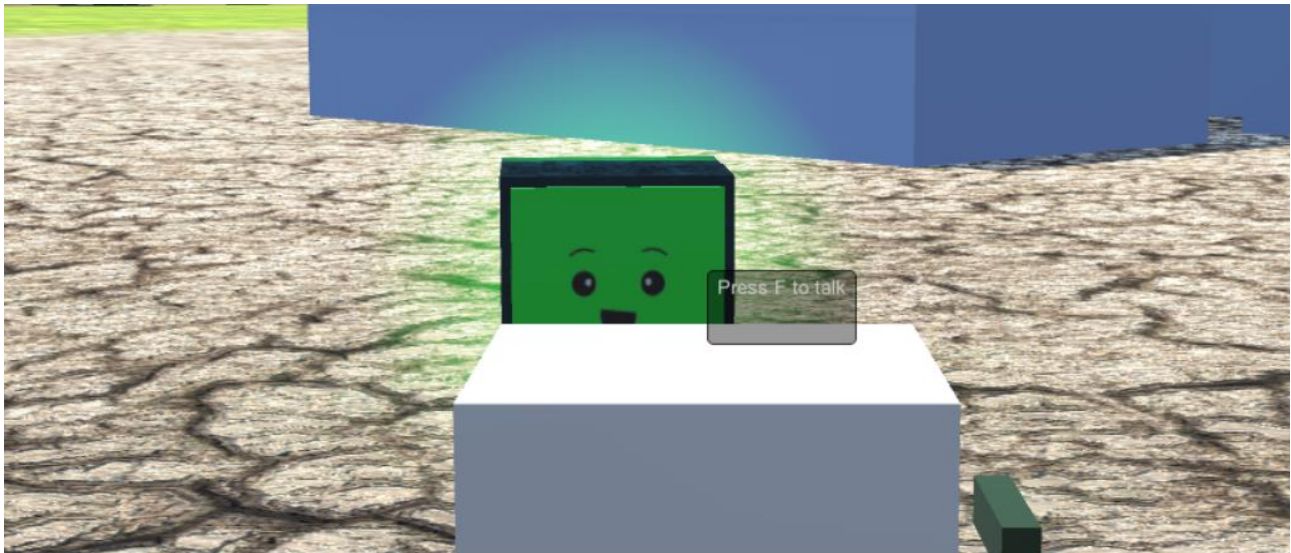
Figur 35 Encountering a quest/shop villager will have them stop and face the player, while the player will be told to press 'F' to engage in dialogue. The villager featured here has a quest, and therefore has a green light on, and is a shopkeeper, as its outer color is blue

The light is initially green, but when a quest has been accepted by a player, it will turn yellow (see Figur 36) as to make it easier for players to find the villager again, and to know that they have already taken the featured quest. In relation to how to distinguish the villagers, it was furthermore implemented that the shopkeepers color should be blue instead of green (see Figur 35). Upon approaching a villager which can be talked to, it was implemented that when the players' character was within a close proximity, the villager would turn to look at the character, and stand still as to allow players to easily activate the dialogue, without having to chase the otherwise moving villagers around. When talking to villagers, the movements of the character is furthermore disabled since the mouse is needed to interact with the GUI interface buttons, and that the mouse is also used to move the camera around.
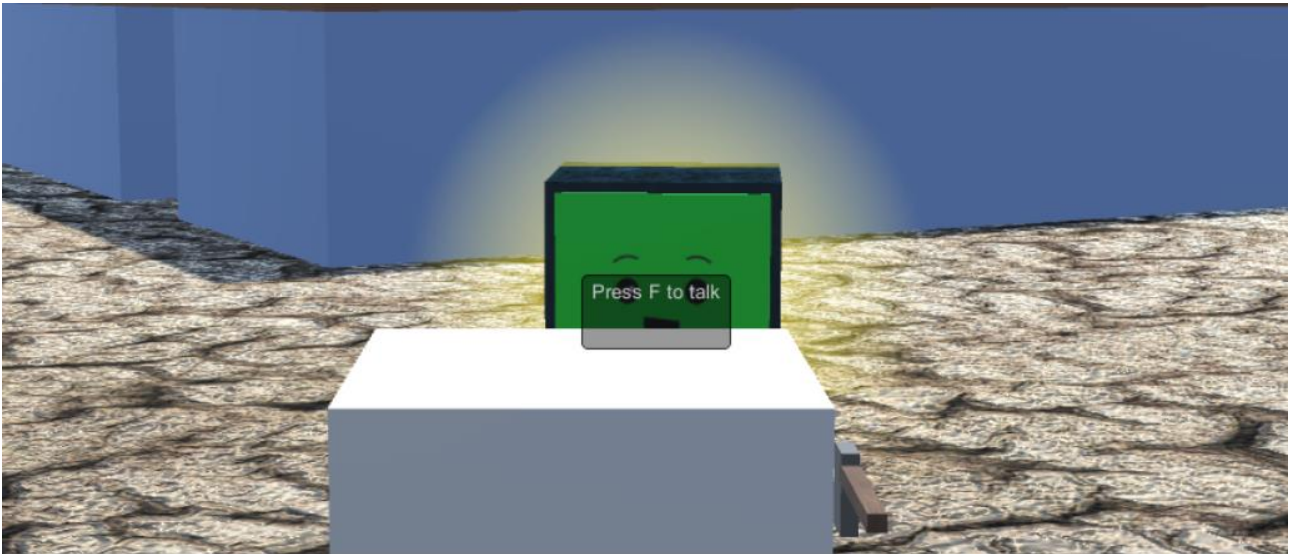
Figur 36 The quest offered is accepted, and the light is now yellow

For this game the inbuilt UNITY feature of a navigational mesh was used as to make the villagers and bandits move, while at the same time avoid obstacles. The implementation process for this was lengthy and due to many obstacles being present which the navigation feature should calculate how to avoid, this also accounted for creating lag that can be experienced on lower-end computers trying to run this game. As such, this was the only game in which this feature was used.

The villagers were given several points they could go to using the navigation feature, however, there was a difference as to the movement pattern they were given. As the first village should seem buzzing with life (which was one of the choices that also related to the 'boom box' quest), all villagers here, except one, would be given the feature of going into their own house once, and then move around the village for about 8 points until they returned to the house and started a new cycle of movement. The only villager, who returns multiple times to his house during a cycle, is the villager whose house is requested to be blown up by the crooked villager. He was furthermore given the second facial expression as his first, instead of the initial happy one (see Figur 37 for the villager leaving his house, and Figur 38 for the destroyed house). This was to make him easier to distinguish from the rest of the villagers during the 'boom box' mission (this is naturally when assuming that the players have not begun to shoot up all the villagers, in which situation the facial feature would cease to matter).
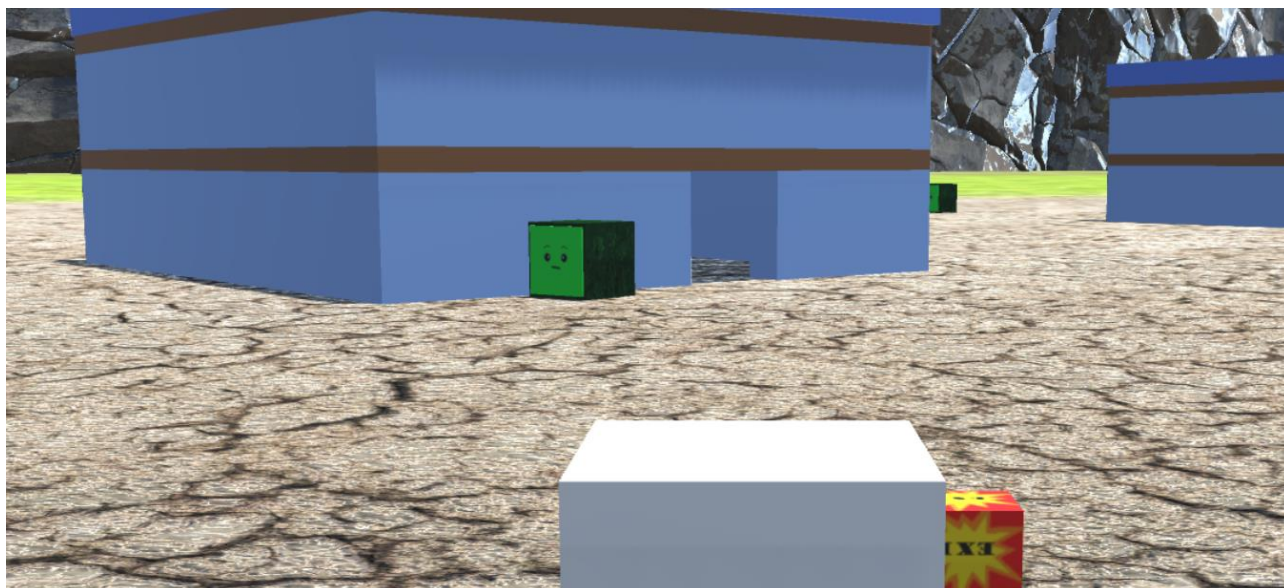
Figur 37 The villager in the first city leaves his house, as we are about to enter it and blow it up
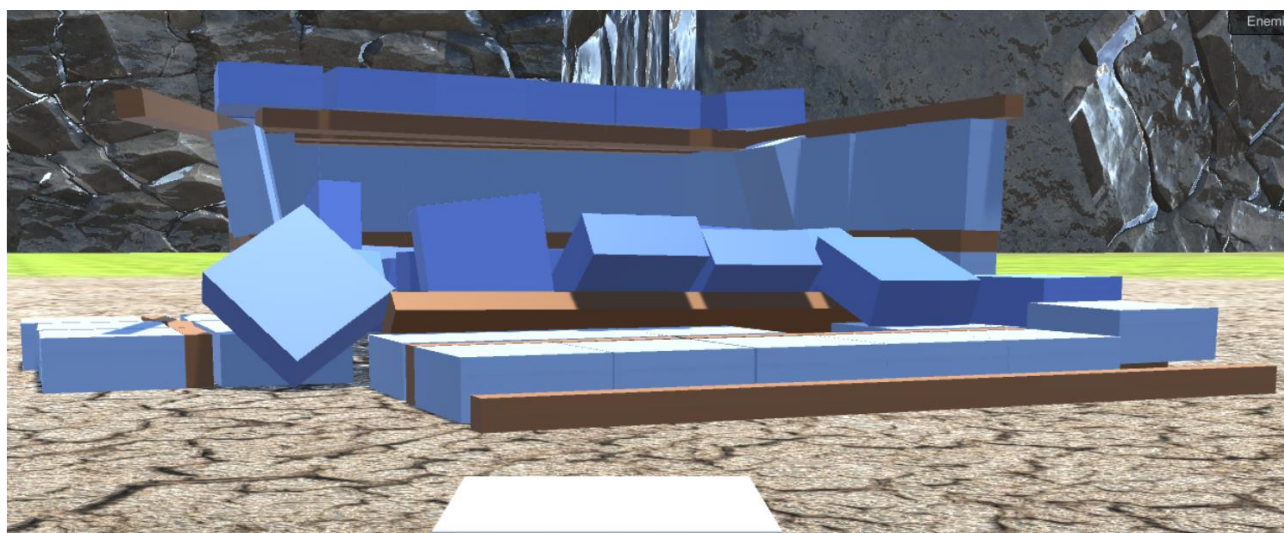
Figur 38 The house after the explosive has done its work. As can be seen the different components making up the house no longer stays together, as their 'rigidbody' component toggles their simulated physics

The second village was given less villagers as opposed to the amount of houses, and each villager will move from house to house, in an attempt to try and portray them as seeking hiding places. Their facial expressions were also set to begin with the second expression as to further underlie the unsafe situation they are in. The villagers for the third village was placed just outside it where the players will be able to approach them before entering the village, and these villagers will move about different points in a very close proximity to where they are placed. Their facial expressions will be that of the fourth type, as to underlie the situation of them having to abandon their village altogether. The fourth bandit, as talked about earlier, will be placed close to these villagers, such that the players cannot avoid spotting it. It was furthermore made quit the giant, as can be seen on Figur 39.

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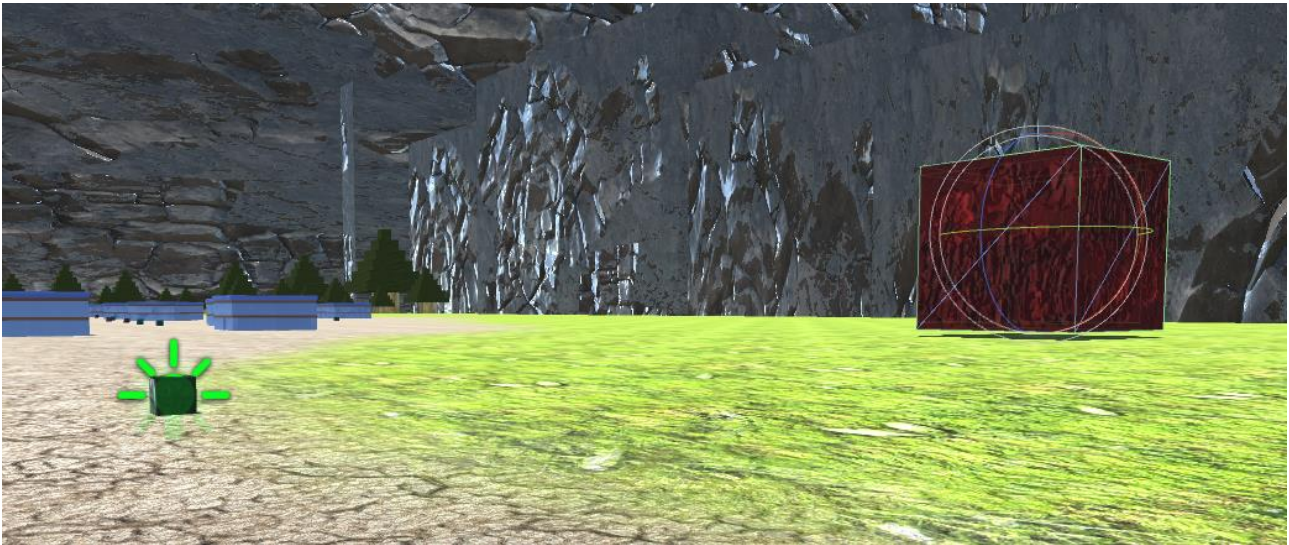
Figur 39 A normal sized villager can be seen in the left side of the image, as the giant fourth enemy can be seen on the right

The stats on the players and other characters', as a reference to difficulty, were implemented as the following:

Villagers; health - 30
Easy bandit; health - 50, damage to hero - 1, detection radius - 35
Normal bandit; health - 70, damage to hero - 2, detection radius - 30
Hard bandit; health - 100, damage to hero - 3, detection radius - 25
Giant bandit; health - 300, damage to hero - 5 - detection radius - 25

Hero; health - 100, small gun damage maximum - 5, bigger gun damage maximum - 15, 'boom box' damage - villagers and Easy bandits 25 - Normal bandits 20 - Hard bandits 18 - giant bandit 0, 'energy shield' - instant kill for all.

In relation to the 'boom box' effect, and also a way to try and reduce lag, the script which normally comes with the explosion script had to be altered. To keep it short and un-technical, the houses created for the game originally was intended to have the component of a "Rigidbody" on all the small objects put together to resemble the house. However, this created the situation that some houses would simply collapse on their own, and if players ran through the walls of the houses, they would equally collapse. As such these components had to be removed, but in order for the houses to still be destroyable, the explosion script was used. In this I added code detecting whether or not the explosion had 'touched' objects with no rigid body (and for safety not having the custom tag 'Immovable'), which had the code then add this component before adding force to objects within effect range. As such houses components would be given a rigid body upon explosion, which lead the effected houses to collapse. The second adaptation to the script was in relation to the created crops as mentioned earlier, in which the explosion script checks objects for the tag "Crop", and if found, it will activate the fire particles (see Figur 28) which are already a part of the crop's prefab. In further adaptation to the script it was made to distinguish between damage to be dealt to villagers and

bandits, and for the quest involving the 'boom boxes', an object was placed below the house (see Figur 40) which is to be destroyed, where the explosion script searches for this object and if found, the 'boom box' quest is completed.
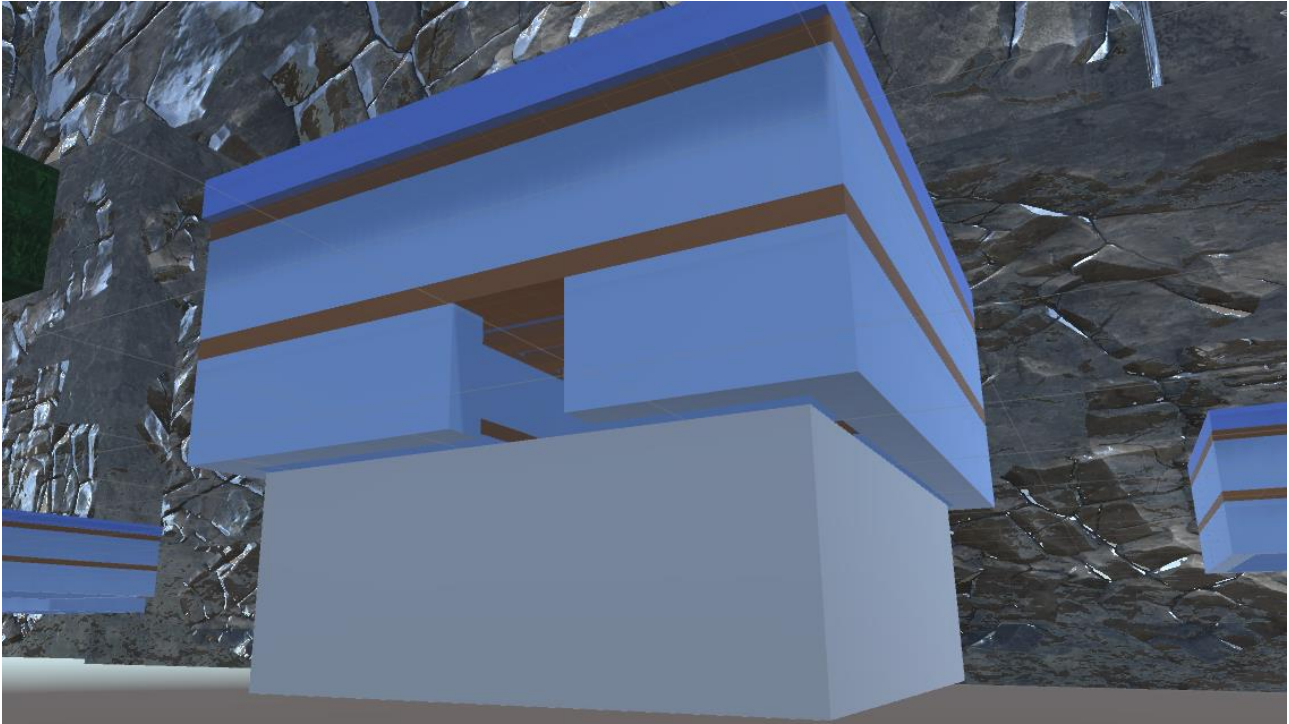
Figur 40 A view from below the house, where a big white cube was hidden under the floor, which was able to detect the explosion that would complete the 'boom box' quest

For the implementation of gaining wood logs as currency, a small 'axe' object was created. When equipped, it was implemented that players can simply collide with a tree, which then renders a certain amount of logs, depending on its size. In order to not 'cheat' players of logs if they reach the maximum amount of logs to be carried, I implemented that the code would simply check if the players had reached this cap, and if not, then add the amount of logs from the current cut down tree. As such, when having a higher amount than the cap, the trees will simply not take any effect upon collision with the player. The amount of tree logs was implemented to be shown when entering the shop menu of a shopkeeper (see Figur 41).

In order to help players not getting lost in the environment, and at the same time provide them information in relation with enemies and quest/shop villagers, a mini-map was implemented. The mini-map is simply an extra place camera on the screen, high above the environment, looking down at the terrain. When players press the 'M' key, the mini-map can be toggle on/off. In relation to provide information as to where the players' character is currently at, a red dot (a quad object) has been placed above the character. The quest/shop villagers have equally a red dot above them, but the bandits has different colored dots in relation to which type of bandit they are. As to make sure that the cam used as the players view does not show the dots meant for the mini-map, the dots are rendered on a different layer, which the player cam does not show. When an enemy dies, its dot is

removed from the mini-map as to make it easier to find the 'living' bandits of the game (see Figur 42 for dead enemies not having actives dots).

Figur 41 How the shop menu look, where (on this instance) two ammunition types have been unlocked, and the amount of logs left (as seen marked by the red box) is 60

Figur 42 This image shows the character in the game with an active mini-map, and a bunch of dead enemies around him. As can be seen on the mini-map, the player (marked with a red square) is not surrounded by enemy markers, as they are de-activated for the dead enmies

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As can be seen on the mini-map (Figur 26), quite many bandits are available to kill in the game. The amounts of them (271) were added as to try and create a fast-paced gameplay. In order for player to keep track of how many enemies they need to kill, a counter has been added to both show the amount left, and the total amount of enemies. Upon killing all the enemies, the game will be done (no matter how many quests the players have finished), and a small dialogue box from the military character will appear again and state that the character will be debriefed, although it is hinted that he may just be eradicated once the information about the assignment has been gathered. If, on the other hand, the player is killed, a small GUI box will let them know they have failed, and that they have to reload the game. In this, the players' movement is deactivated, but the enemies are still attacking. It looked rather funny as their collision with the character makes it appear that they throw it up in the air, so I left it in as can be seen on Figur 43, with the additional thought that it might provoke players to be more vigilant in trying to kill them again.

Figur 43 The character has died, but the enemies are still attacking it.

5.2.1.3 Adding the statements and questionnaires

For this game I decided to have four different places in which a player is given a questionnaire (i.e. 3 RQ2s and one LQ3). In relation to the explained for my framework (3 Creating the framework and test method), the first RQ2 will be presented after the tutorial level is completed. The other three questionnaires will be presented at places where it is expected that there is quiet moments, namely the villages. As such there is one questionnaire for each village, which will be presented to the players upon entering the villages (except for the last enemy overrun village, where the questionnaire will be activated just outside, along with the banned villagers.

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As for the statements in relation to why a participant rated their CoDe as they did, the following statements were formulated in coherency with the CoDe elements:

I want to solve the game's challenges
I do not like the challenges provided in this game
I want to explore the game's environment
I don't like exessive exploration
The game allows for enough exploration oppertunities
There is not enough to explore
There are things I want to experiement with in the game
There is not enough experiemnt oppertunities
I want to continue destroying things
I don't like that I have to destroy things in this game
I enjoy the chaos I create in the game
I don't enjoy the destruction chaos in this game
I find the story compelling and well told
I hate the story it should be different
I am curious to see how the story will develop
The story is boring
I like the way the story is revealed
The game would be better without the story-element
I would like to see more to the characters
I find the characters boring
The characters amuses me
I want to kill all/some of the characters
I want to complete/ win this game
The game does not give me the desire to complete/win it
I want to progress in this game
I just want this game to be over
I want to become stronger in this game
The upgrades are boring

As such, we move on to the next game.

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5.2.2 The 'Social' game (Maze flyer)

5.2.2.1 Designing the game

5.2.2.1.1 The Gamer Motivation Model aspect

The primary player type of 'Social' has the two subtypes 'Competition' and 'Community'. For these subtypes there are the following preferences: Enjoying competition with others - such as having duels or teams vs. teams, higher rankings/levels in relation to friends, chatting with other players, grouping up with other players, working towards a common goal, using games as an integral part of maintaining a social network.

Some of the above mentioned preferences would be extremely hard to create as in relation to the timeframe and the scope of this project. Hence I have chosen to not try to design for teams vs. teams, in-game chatting (this could however be done using other external programs such as using the program 'Skype' if there was ever a need to include this) or attempt to create a game that could fuel a large social network. As such this game will be grounded upon having two different modes: dueling and cooperation. In order to try and accommodate for the social aspect of wanting to chat with other people and play together, I have furthermore chosen to <u>not</u> make the game an online experience, which means that the two players who will play with/against each other will have to be in the same room. Due to the described I have chosen to make the first mode a type of racing game, in which the participants will collect points as they move towards the goal. In the cooperation mode I have chosen that one player will gather points, while the other player protects him/her from enemies. As such the game will be able to feature the aspects of competition, dueling, ranking (in terms of collected points), grouping up, working towards a common goal and chatting (as the players need to be in the same room).

5.2.2.1.2 The Self-Determination Theory aspect

In terms of the CAR aspects in SDT, I will argue that the 'Relatedness' factor should be the most important as to accommodate for this player type. But as this will be a multiplayer game, the felt relatedness is more a feature which relates to the second player and how the two players can interact in the game rather than feeling 'Relatedness' to the game itself. As such it is the features of the game in regards to how the players can interact with each other that are important in terms of 'Relatedness'. For the 'Competence' aspect I will argue that it is important that the game controls can be quickly learned as the competitive players will want to gather a higher score than their opponent, and as such they should not struggle with learning difficult controls. In relation to that it was already chosen that this game should have a racing mode and a gathering/protection mode, the controls for this game will simply be to move around and shoot. For the 'Autonomy' component in relation to this player type, the design for freedom is not the most important aspect as it is more the 'Relatedness' which is in focus. However, the players should feel that they are autonomous enough in order for them to compete/cooperate adequately, and in relation to this I have chosen to furthermore implement a speed-boost for the players to use at will and without limitation, as I figure that this extra feature should create a further dynamic in how the players play the game both against and with each other.

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5.2.2.1.3 The Continuation Desire aspect

From the CoDe perspective there is mainly the 'Socializing' aspect, but as a secondary element from 'Activities' I have chosen to include 'Destruction'. The 'Socializing' aspect is mostly a thing that will occur outside the game, as already written about, where this should be prompted by the gameplay. The 'Destruction' element however, has been chosen from the perspective that when a player fails (e.g. rams into a wall in the created racetrack), the consequence should be quite severe as to destroy said player's in-game character. This should hopefully generate a stronger mood in the players than if their character would just bounce off the walls upon colliding with them.

5.2.2.1.4 The design choices

With the above points established, the specification of the design will now be explained. For this game I have chosen to portray the players' characters as flying objects. In relation to the two modes, the players will maneuver their flying object through what will forwardly be called 'the maze' in the first mode, and when playing the cooperation mode, I have chosen that one player will be able to fly around while the other cannot. For the maze I have chosen that beyond the collectable objects, which should be portrayed as something of value e.g. coins, there should also be enemies. I have chosen that the enemies should not be able to move, and will simply pose as obstacles during the course of the maze. The players will be given the ability of shooting and destroying these enemies as to further gain points, where more points can be gathered from shooting an enemy than from picking up the collectable point objects.

As already stated in relation to the CoDe 'Activities' it was chosen that players' character should be destroyed upon impacting with walls. As such I have made the further design choice that the bottom of the maze will be filled with water, and that there will be a 'net' above the maze and if a player collide with either of these, they will equally be destroyed as to keep coherency of the game. This will be the same in correlation with the enemies present in the maze. In relation to this I have chosen that there should be a small amount of time from the player's character is destroyed, until it reappears in the maze to continue the race. Furthermore, as to not generate a large amount of frustration for a player whose character is destroyed, I have chosen to make points in the maze where a character is spawned after being destroyed. The point at which a player's character will appear again, will be the last passed spawn point.

In regards to gameplay, I have chosen that there should not be a time limit in regards to completing the race, but that the first player to reach the goal will be given an extra amount of coins to further the competition between the players. As such the players do not have to hurry along the track, but can take time flying back and forth to collect points. This should hopefully prompt the players to compete about getting the most points where they one player may taunt the other by collecting a point which was right in front of the first player. In regards to the competition mode, I have also chosen to include a secondary enemy which will forwardly be called 'the eraser'. The eraser will run the maze same as the players, however, it will start after the players have gotten a head start, and it will have a slower movement speed. The function of the eraser is to delete the collectable objects and the enemy objects in the maze as it passes them and if a player gets too close to the eraser, he/she

will lose all gathered points. The reason for adding this feature to the game is to add the extra challenge of gathering the points and shooting the enemies before the eraser can delete them, and also to prompt the players to not be extremely slow in completing the maze as to linger at places where they can gather points in attempts to collect every single object featured in the maze. As such a player may linger behind the other player in an attempt to collect all available points, but if caught by the eraser, the player also risks losing every single point gathered. The player racing ahead in said scenario will not have the opportunity of gathering the collectable point objects left behind (unless of cause the player turns around and goes back), but the player will be able to linger at another spot ahead of the other player, with more time to gather points before the eraser approaches.

When playing the cooperation mode, it has already been stated earlier that one player should be able to move and collect points, where the other would not move. In relation to the non-movable player, this is not to say that the player is not able to rotate and look around, but just that the player cannot move away from the initial starting point in this game mode. As already written about earlier, the non-movable player has the role of protecting the player collecting points, and as such it will only be the defending player that has the ability to shoot.

The area in which this mode takes place will be a much smaller one than the maze, and the players will be able to see each other at all times. The area will be a defined space from which the players are confined, and the collectable point objects will be spawned inside this area. I have chosen that the enemies (which are what the moving player needs to be defended against) will spawn in relation to how many collectable point objects that have appeared, such that for every seven point objects, one enemy will spawn. The enemies will chase the moving player around, where their speed will be faster than the base speed of the player, but slower than when the speed boost is activated. Both the point objects and the enemies will be spawned by the same function as to make sure that they are inside the defined area and to make it a bit more challenging when enemies can spawn the same places as point objects. Shooting the enemies will still generate points, and the coherency of destruction upon touching enemies, walls, floors or the above placed 'net' will still be featured. When a player dies in this mode, the game will finish, as opposed to the other mode. As such the gameplay in this game is for the players to get as many points as possible before failing. As a further design choice for this game, I have decided that the time between the spawns of the point objects/enemies should decrease as to increase both the danger from the enemies and the amount of points available for collecting.

5.2.2.2 Implementing the game

The visuals for this game was kept very simple, where the only objects that can be stated to be non-effective is four pillars that are related as the starting points for the players' characters (see Figur 44). Since it was a design choice that the players should fly around, the visual choice for their characters was selected to be spheres, where small exhaust pipes with particle effects (see Figur 45) were added for aesthetic purposes of creating the illusion that the characters contained some engine propelling them forward. The maze was constructed by using the 'legacy terrain' game object embedded in UNITY, where a canyon was created that is linked to itself (se seen on Figur 46). The place in the canyon in which the players start either mode of the game, can be seen somewhat centered on the

terrain, where the ground was lifted a bit above the water level as to indicate this place as the starting ground.

Figur 44 This image shows the starting ground in the game, where the four pillars are featured. The two on the left is where the players will start in the competitive mode, where the two on the right is where they will start in the cooperation mode
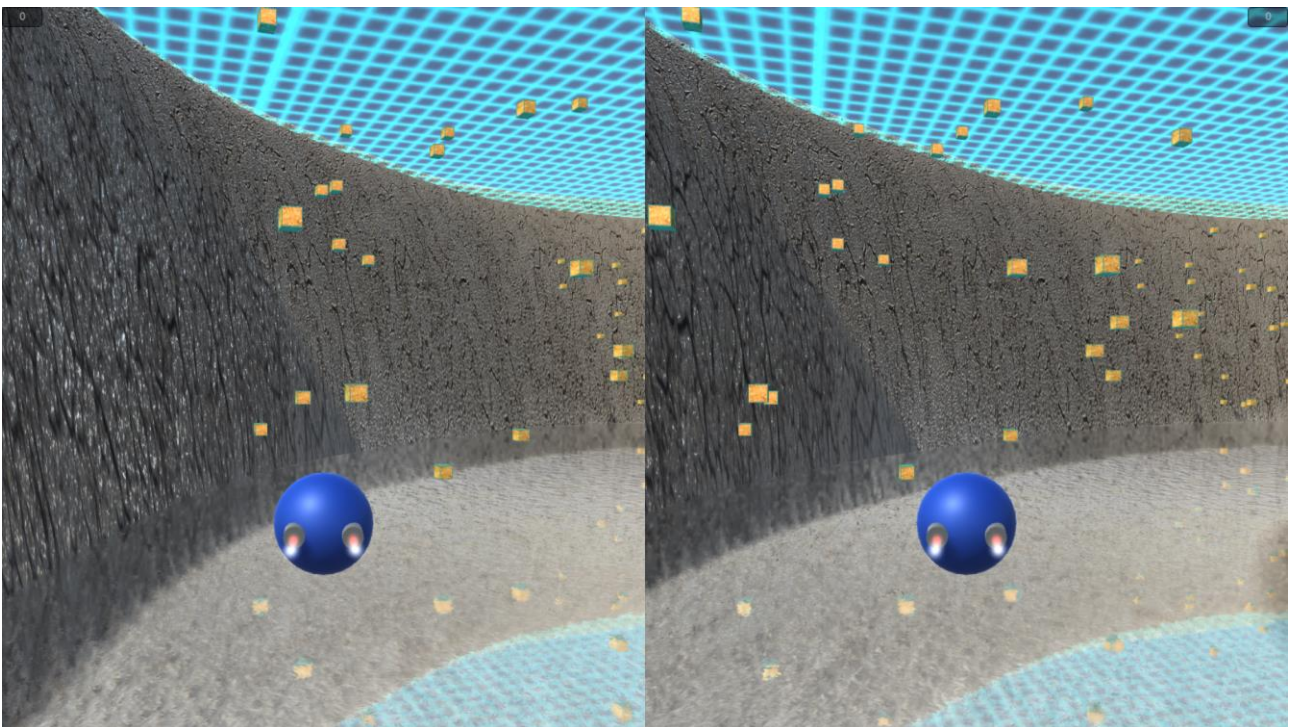
Figur 45 This image is taken at the beginning of a competitive match. The game features a split screen, as to allow the players to follow their own character. As can be seen, both characters are blue balls, with what should look like two exhaustion pipes letting out steam and a bit of fire. As can also be seen on this image is the spawned point boxes, and point counters for each player, in the upper left and upper right corner
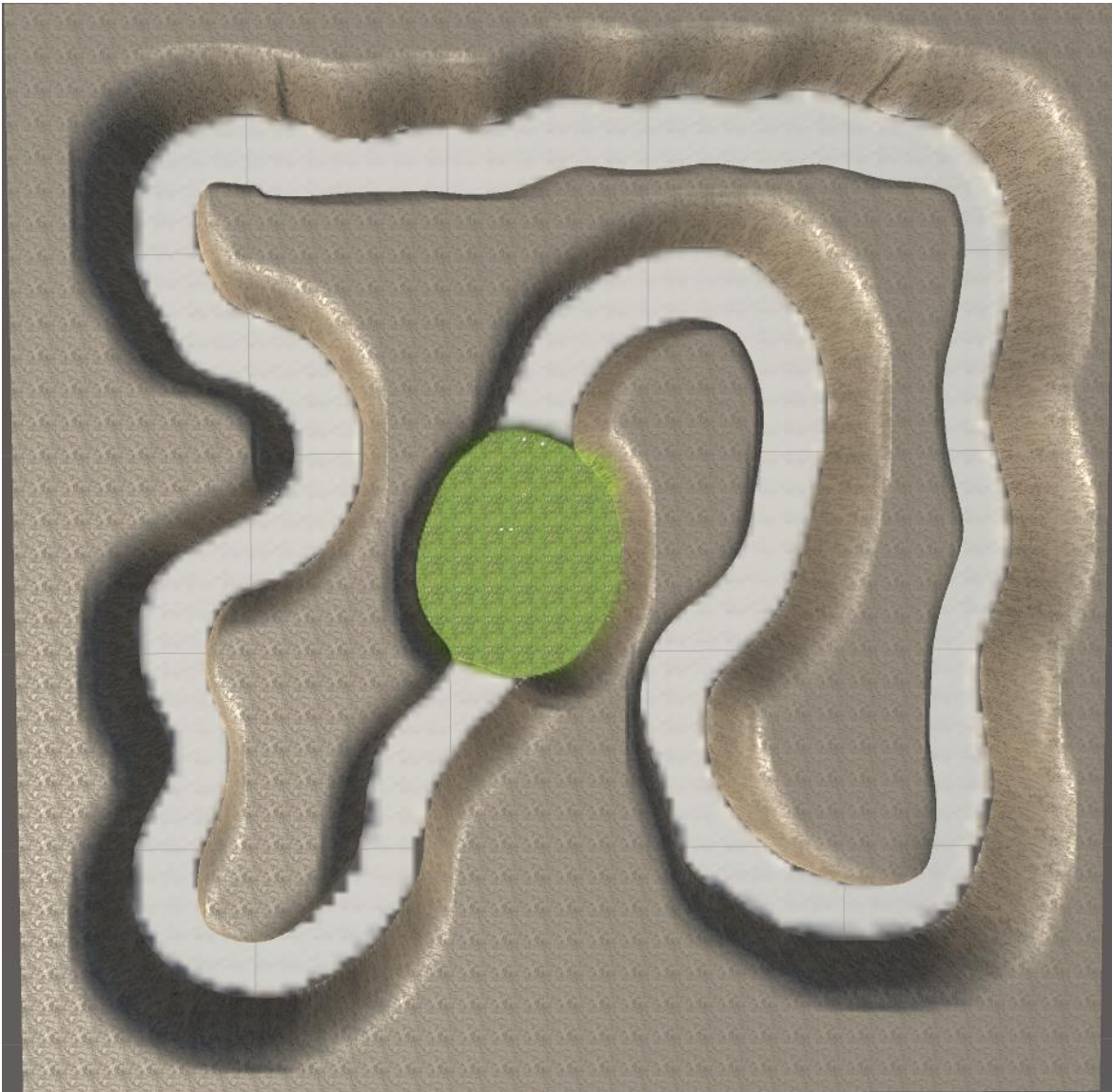
Figur 46 How the maze looks from above. As can be seen, it appears like a sort of canyon, where the middle green circle is the start area.

The design choice of featuring nets which contains the players in the maze can be seen on Figur 47. These nets were created with the aesthetic choice of making them appear as if they are either made of energy, or has current running through them. They were given the next texture by using the additive feature that can be selected on UNITY materials, and have the texture being transparent as to allow players to see through the holes of the nets. The nets were further used to split the starting ground in two, as to make sure that players could not complete a race by going in the wrong direction. As to indicate where the goal for the first competitive mode of the game is, a quad (that has the innate feature of not being visible from one side) was used as can be seen on Figur 48.
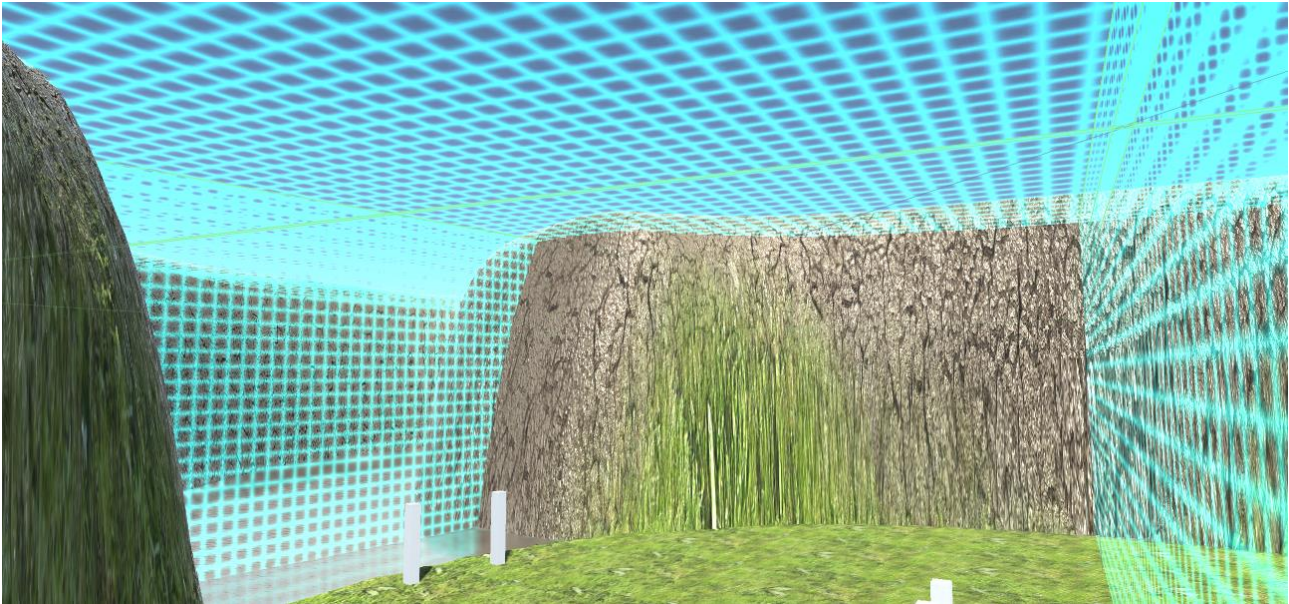
Figur 47 In this image the blue nets created for the game can be seen. If a player's character touches it, the character will be destroyed. The left net blocks the maze during the cooperative mode, while the net on the right blocks players from reaching the goal from the wrong side

Figur 48 How the goal marker looks for the maze race

For the competitive race, the implemented spawn points that would reenter a player whose character had been destroyed were made by using cubes placed in the maze (see Figur 49). These were rotated and placed such that their z-axis (the axis which is normally used to indicate which way is forward) pointed in the correct direction as to move forward in the maze, and placed such that they would spawn a player's character somewhat in the center of the canyon. During a race in the competitive mode, it was implemented that whenever a player's character had a collision (which cannot be seen as a visible function since the collider for this has been marked as trigger to avoid

activating the physics of colliding with something) with one of these cubes, the cube would be set as the spawn point.
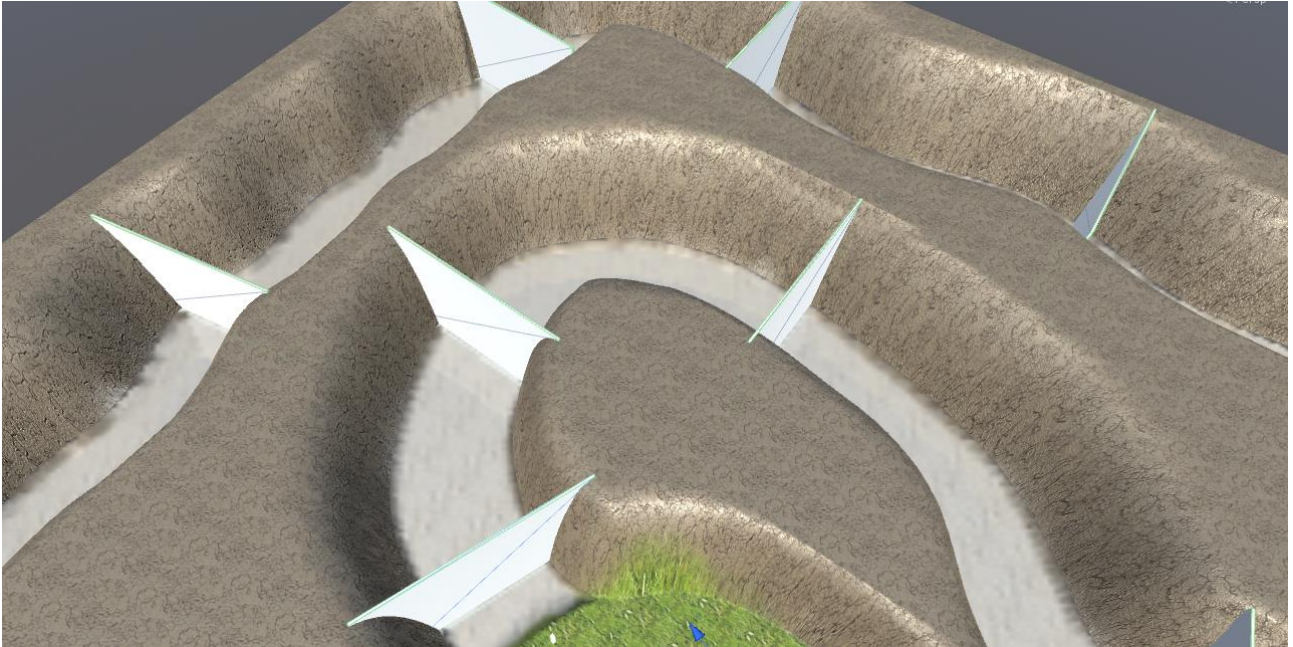
The 'eraser', and how it looks during gameplay can be seen on Figur 50. It was implemented that the movement of the eraser followed a similar structure as the placed cubes used for spawning players, but there were place many more of these cubes as movement points for the 'eraser' as it required greater detail in movement than what the spawn points could offer.
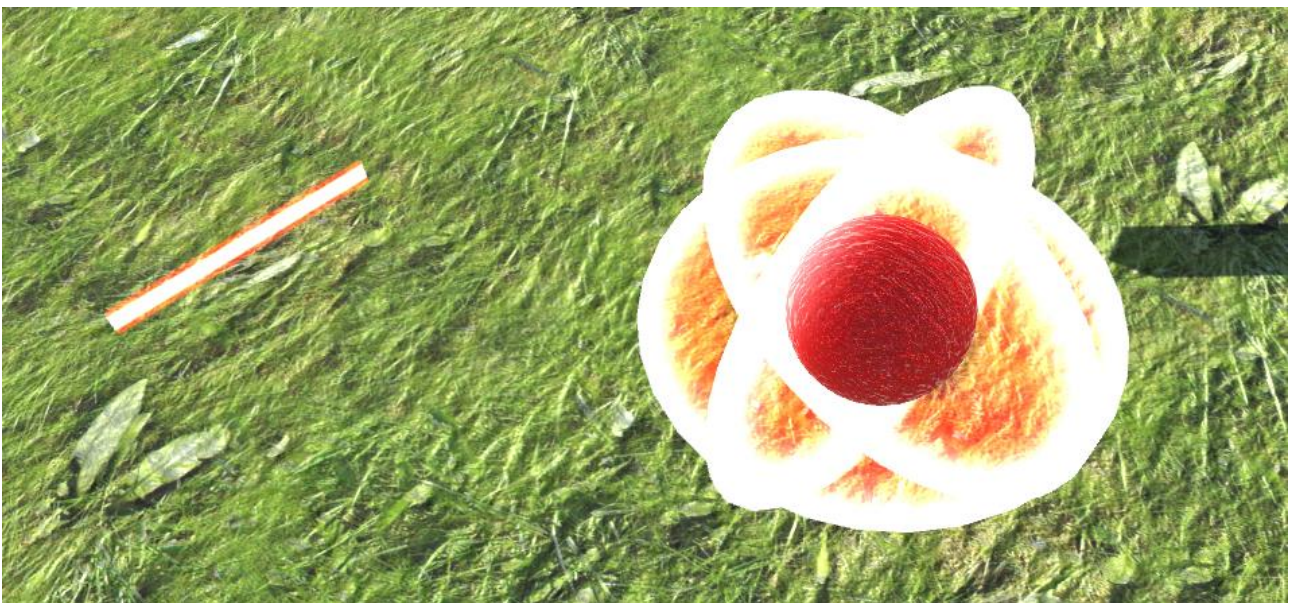
Figur 50 In this image the 'eraser' can be seen to the right, and the prefab for the lines coming out of it can be seen on the left

The eraser functions by detecting objects (the players' characters, point boxes and enemies) within a certain range (carefully balanced as to not have the range supersede the width of the canyon), and upon detection a 'line' is created between the 'eraser' and the object, where after a certain amount of time, the objects is deleted (or if is a character, the points is set to zero). The line between the 'eraser' and the object is simply a capsule (see Figur 50) which is stretched from the 'eraser' to the object (see Figur 51). As many objects can be in range of the 'eraser' at one time, the code was created as to contain lists, where objects in range and the created 'lines' were stored, such that multiple lines could be obtained at the same time.
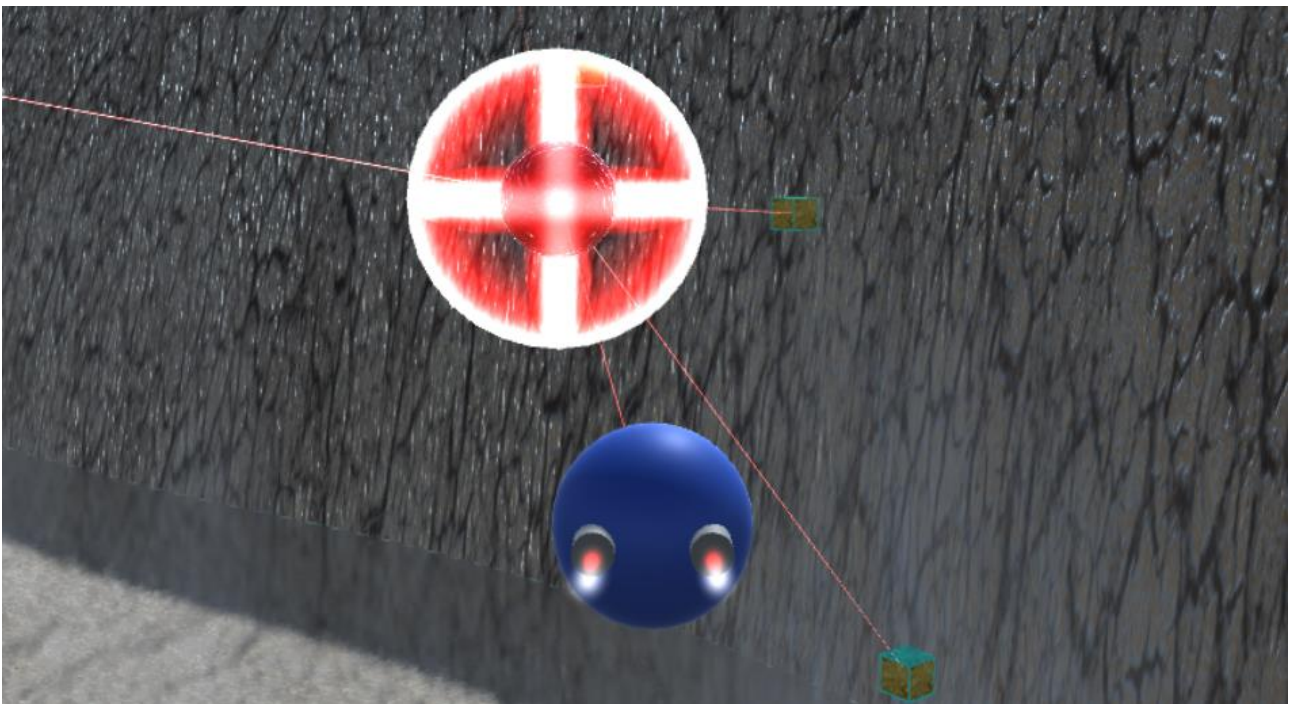
Figur 51 In this image it can be seen how the prefab lines are being stretched out from the eraser to an object, and the player character which is too close, is also given a line, as to indicate that their points are about to be erased as well

For the point boxes, these were created by using several cubes, where the 'inner' cube was given the texture of gold coins, and the outer cubes creates the visual that the coins are contained inside a box (see Figur 52). Upon colliding with a box, a player will gain 3 points. For the maze I found it important that the boxes would not always be featured at the same spots (in case of re-plays), and as such I implemented that boxes (and enemies) would be given a semi-random place in relation to a given point. As such there are several of such points throughout the maze, where some of them will only spawn point boxes, and others will only spawn enemies. The reason for applying semi-randomness instead of full randomness was to avoid boxes and enemies would spawn inside the canyon walls. The enemies came to look as can be seen on Figur 52, where the individual boxes put together rotated around the center point, and flames continuingly burn. If players shoot these enemies, they will be given 15 points, and the enemy will disappear. The shooting mechanism of the players ended up looking like shown on Figur 53, where these will only have an effect on enemies.
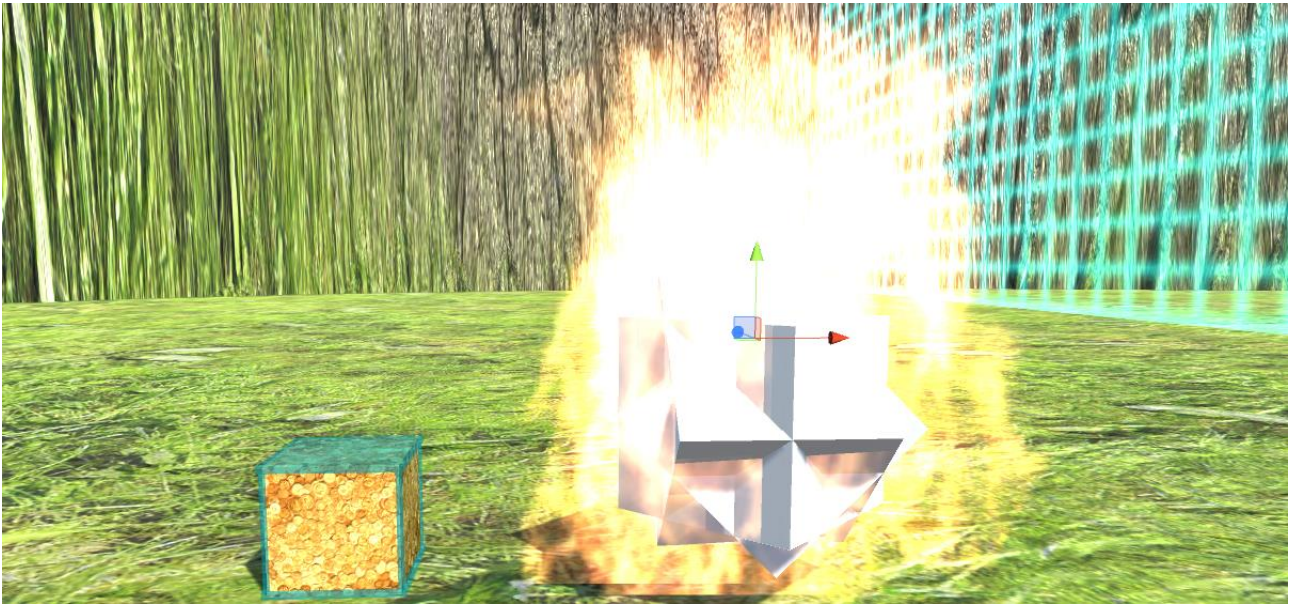
Figur 52 A coin box can be seen to the left in this image, where the right object is a burning enemy
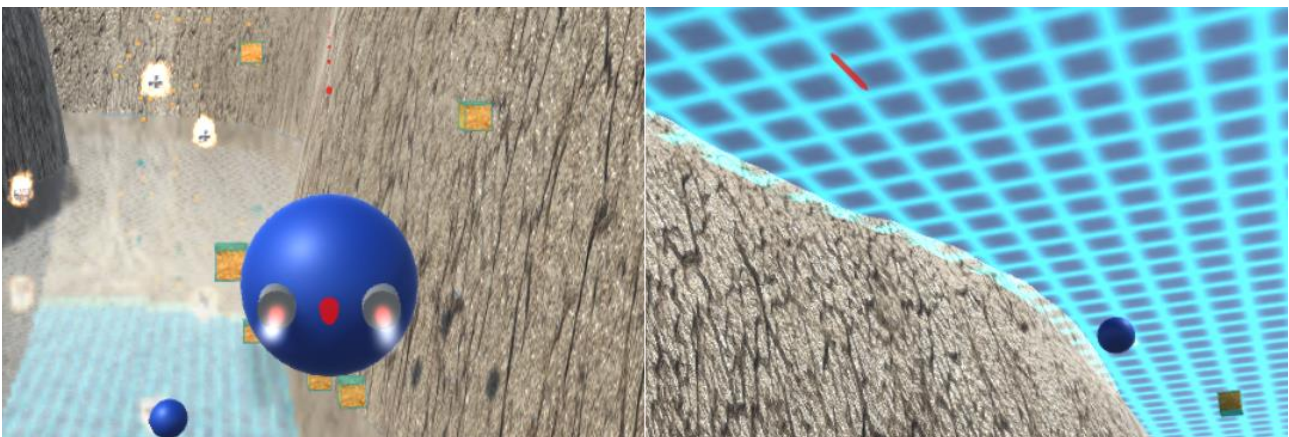
Figur 53 In this image the shooting mechanism can be seen. On the left image it is seen from the shooters perspective, on the right image, it is seen from the other player's perspective

During the competitive mode, the net which can be seen in Figur 47 will be removed as to allow players to enter the maze. For the cooperation mode however, this net will continue to be present, as to keep the players in the enclosure. A point is furthermore placed within the enclosure, as to spawn coin boxes and enemies. The enemies have in this mode been given a forward speed while being forced to face the player collecting points, and as such they will chase the player around until catching the player, or getting eliminated by the other player shooting them (see Figur 54 for gameplay). The difference in when enemies will be spawned is in relation the spawning of point boxes. I chose to implement that for every seven point boxes spawned, an enemy will appear. Both point boxes and enemies will be spawned in relation to the same point. As a design choice it was stated that upon touching anything other than the initial pillars from which players' characters launch, their character should be destroyed. This was implemented by simply setting the character as invisible and instantiate an explosion on its place. As such it appears that the player's character explodes (see Figur 55).
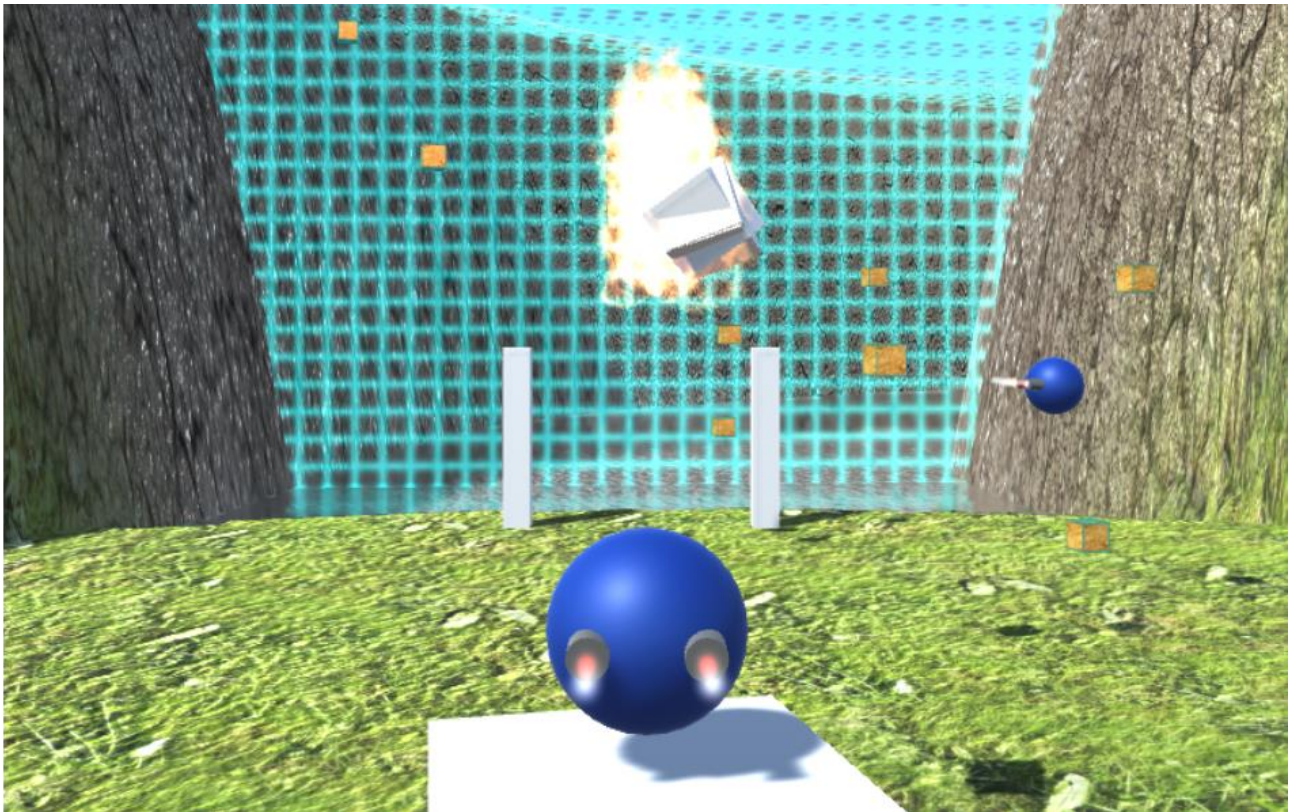
Figur 54 A screen capture from the cooperation mode, where the collecting player is running from an enemy and point boxes that has spawned can be seen, and the defending player is stuck at the white pillar
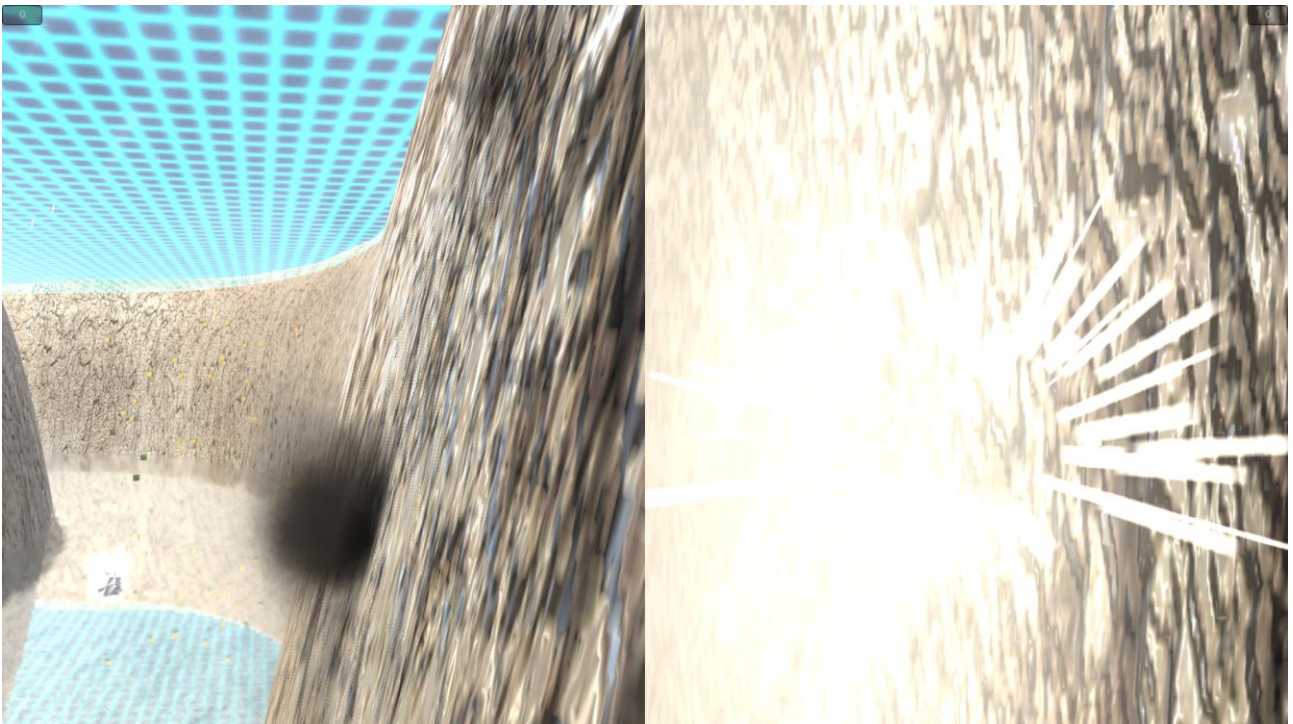
Figur 55 In this image both players' characters were destroyed, where the left one is further in the explosion action, where the right is just a bit earlier in the exploding action

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The game will be over when both game modes has been played, where the maze needs to be completed by both players, and the collecting player has been destroyed in the cooperation mode. As a way of controlling which game mode as to start with, I furthermore implemented that when entering the game, the competitive game mode is the only one that is selectable, where the maze race has to be complete in order to unlock the other mode. The reason for this is explained below about the questionnaires.

5.2.2.3 Adding the statements and questionnaires

For this game I have chosen to only feature three questionnaires. The first two will be presented in the competition mode, where they will be activated when the participant triggers on of two objects for this, and the third will be presented in the cooperation mode, after four enemies has spawned (total). As such I, as already stated about the implementation, have made sure that the questionnaires are taken in the correct order, as to make it easier in comparing the participants' results. In relation to present the questionnaire within matches instead of after them, I am not entirely using my own suggestions for this stated in the framework chapter (3 Creating the framework and test method). However, I will argue that my suggestions are more in terms of games that allows for much content and replayability, where my own game cannot be said to feature much content. As such, gathering the data during the matches seemed more logical for this game.

As for the statements in relation to why a participant rated their CoDe as they did, the following statements were formulated in coherency with the CoDe elements:

I like the social aspect of this game
This game does not give me a social interaction I enjoy
I like to compete in this game
I don't like to compete in this game
I like the cooperation in this game
I don't like the cooperation in this game
I want to complete/ win this game
The game does not give me the desire to complete/win it

As these statements have been determined for the 'Social' game, we now move over to the 'Mastery' game.

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5.2.3 The 'Mastery' game (Defend your castle)

5.2.3.1 Designing the game

5.2.3.1.1 The Gamer Motivation Model aspect

For the primary player type of 'Mastery' the two subtypes are denounced 'Challenge' and ' Strategy'. Here the two subtypes have the following features: persistence in practice as to take the highest difficulty levels a game has to offer, they do not mind failing missions/bosses because they view this as a way to learn how to master a game, they want a constant challenge, want to make careful decision-making and planning, enjoys seeing their carefully thought out plan come to life and want to come up with the most optimal strategy.

In order to accommodate for the different preferences, I have chosen that this game will be a turn based and resource managing one in which there will be a limited amount of turns as to create a challenge. The player will face off against a simple, non-complex AI (Artificial Intelligence) opponent I create, where this opponent will be given a certain amount of randomness in terms of what it will do each turn as to not make it predictable. From this perspective I have furthermore chosen that the gameplay will feature building, where the different types of structures will have a different amount of turns from they are selected to they are build (i.e. if a player selects a building which has a "building time" of five turns, then five turns needs to be made before the building is finished). In relation to this I have chosen that once build, a construction cannot be un-done, which should increase the challenge level and encourage planning as well as thinking of an optimal building strategy.

5.2.3.1.2 The Self-Determination Theory aspect

When taking in the perspective of the CAR components of the SDT in this game, the player type as described by the 'Gamer Motivation Model' does not appear as to have one CAR element which stands taller than the others. In fact, by the description it would seem that none of them are even important for a 'Mastery' player type. It can be argued that the 'Competence' should be the most important, but as stated about the type, these players does not mind failing and taking on challenges far beyond their own skill level, as they want to improve their skills. For the 'Autonomy' component it would even seem that this is in the way of creating a challenge high enough for them to feel adequate challenged and in terms of 'Relatedness' this does not appear to have an effect on this group either. However, as it can be argued that this player type does not need to feel a high engagement by the CAR elements, this can still be used in the design of this game. It simply have to be reversed, where the design aims for a low amount of 'Competence' and 'Autonomy' to be felt by a player, since this will create a larger challenge instead. As such this reversed use could be able to satisfy the psychological needs of a 'Mastery' type player. For the Relatedness I will argue that having an opponent to beat will be adequate enough for this player type as long as the opponent provides a sufficient amount of challenge to beat.

5.2.3.1.3 The Continuation Desire aspect

For this game, I have chosen the CoDe 'Activities' of 'Solving Problems' as the main type, where the secondary types are 'Creation' and 'Interfacing'. As this game is directed towards the type of 'Mastery' the chosen main 'Activity' should come as no surprise. The game will be built upon the sole purpose

of beating an opponent by building and managing resources. For this the already chosen elements of turned based and 'Autonomy' limited gameplay is in line with this 'Activity', and the 'Creation' 'Activity' will be related to the building aspect of the game. The 'Interfacing' as a secondary choice was made from the perspective that when playing such a restricted game, then satisfying visual feedback will create a higher CoDe for the players, where this does not interfere vastly with the gameplay mechanisms.

5.2.3.1.4 The design choices

As the above have been established, the design of the game will hereby be described. For this game I have chosen to make it a top-down view, where the players can see the entire in-game environment which will be used to play on (i.e. think of it as a form of chess-board viewed from above). As such the player will be given the left half of the environment at their disposal, while their AI opponent uses the right side of the environment. The game will feature a limited amount of fields in which players and the AI can build. The amount of turns in this game will be related to as days, and their final amount will be determined under the implementation process, but will be below 100 (i.e. the players can make 100 moves and the AI can make 100 moves). For the gameplay I have chosen that neither the players nor the AI can attack each other during before the amount of days have reached zero. During this time I have designed that the players have two main goals: firstly they need to create troops in order to have something to attack with when the day count reaches zero, and secondly they need to increase their own defense as to hold of the AI's troops. As a design choice I have decided to make the game appears as if it is taking place during a medieval period. Hence, the players and the AI are given a castle of their own which is what needs to be defended/attacked. They will not be able to upgrade these, and therefore needs to use the other buildings, which they have the ability to construct, in order to increase defense and produce soldiers. The things that can be constructed in this game were chosen to be the following: Barracks, cornfields, water pits, houses, defense structures, weapon shops and universities. For the constructions that can be upgrade, I chose that any upgrade would take two turns, and not have an impact on the functionality of the construction while it is being upgraded.

The barracks are what will be responsible for creating troops, and I have chosen that each barrack takes 2 turns to build, can be upgraded two times, as to render more troops per upgrade (i.e. one, two or three), and that troops can only be created if there is enough food and water to support them. Here I have chosen that one troop eats five food and drinks five water per day. This means that whenever a turn has been made (i.e. a day has passed in the game), the amount of food and water resources will be checked, and if there is more food and water than the current amount of troops (and workers) consume, the all placed barracks will create troops in that turn. As the troops will be used to attack the enemy's castle, I have chosen that they should automatically, on creation, move to a strip of ground that will be featured between the player's and the AI's building grounds, from where they will attack when the days have run out.

The cornfields and the water pits are what will create food and water and will not take any more turns to build than the one used in selecting them (e.g. if a player selects a cornfield on "day" 100, the

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cornfield will be usable for "day" 99). In order to make create further challenge, i have chosen that a cornfield can only produce food if it is abject to a water pit either horizontal, vertical or diagonally, which means that one water pit will be able to sustain 8 cornfields at a time. In order to level the playing field a bit however, I have chosen that one water pit should produce three times the amount of a cornfield. The specific numbers for how much is produced by each is decided in the implementation. I have chosen in relation to these fields that a worker can boost the outcome of a cornfield or water pit by four times the amount of what that field produces (e.g. if one cornfield produces 1 food, a villager tending that field will have it render 4 food instead). However, I further made the choice that only one worker is allowed to tend these fields, and that the player cannot choose where the workers should go. Hence this will create a further challenge in which players does not have the ultimate control on how their food and water resources are boosted, and will force them to think about which fields to create and how many workers are needed to tend to them. Further limitations to increase challenge was made in regards to the food and water produced, where I chose that food and water does not stack across days, which means that if a player has e.g. one cornfield and one water pit, across three days, all of these days the amount of food and water will be the same (e.g. 1 food and 3 water).

The houses that can be built in this game will be what control the amount of workers the players can have and will take 1 turn to be built. Here I have chosen for every house to be able to be upgraded twice as to house more workers (i.e. four, six or eight). The workers will be created regardless of the amount of food and water, and they will each consume three food and three water each day. As already stated the workers will boost cornfields and water pits, and upon the workers being created they will select an empty field which they can boost.

Defenses that can be built will take five turns to appear, and I have chosen that they should each add 50 points to players' defense scores. There will be no upgrades for these structures and I have chosen that it should not matter where they are selected to be built, as it is only the points they can add to the defense which has any effect. The defenses will not have any influence on the amount of consumed food or water.

The weapon shops are a feature I have chosen to include which boosts the attack of the created troops. It will take 5 turns to build like the defense structures. The boosts made by these buildings should not be strong enough for e.g. 1 troop to defeat the enemy that has 30 troops, if a player chooses to only build weapon shops, but the added damage dealt should be substantial enough to make a difference if there is roughly the same amount of troops and defenses on both sides. I have chosen that this building should not be given the ability to be upgraded, and it will not demand any of the food and water resources.

The university building was chosen to be added as a method to boost food and water outcome, defense and add troops attack damage. As such I chose that it should have the longest building time of ten turns. Furthermore I chose that the boost gained from universities should be based on what is already built, as this means that a player cannot expect to win by only placing universities and

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barracks. The boosts from the universities are furthermore a weaker boost than e.g. building a defense, but if many defenses and universities are built, this will give a really high amount of defense score, than if only defenses had been built. The universities have been chosen to not be upgradable and will have no influence on the amount of consumed water and food every day.

As already stated previously about this game, it will be over when there are no more turns to make (i.e. the number of days left have reached zero). When reaching this state of the game, I have chosen that all the troops should charge against the enemy's castle, where they, upon reaching it, attack its defense. As such the defense score will be decreased and the winner will be decided when one of the castles has a defense score of zero. As a further choice for the battlefield part of the game, I have decided that when the troops meet an enemy troop on the way to the castles, the enemy with the higher attack score will kill the other troop. However, as to not make it a question about how many weapon shops that has been built, the winning troop will "take damage", and its individual attack score will decrease as to make it less strong if it faces of another enemy troop. Should a situation occur in which the troops are of equal strength, I have decided that they will both be killed. In order to make sure that troops will collide on the battlefield, in an attempt to create a bit of excitement for the players in this regards, I have chosen that all troops should steer towards the center of the enemy castle, as this will ensure the two armies to meet on the battlefield.

5.2.3.2 Implementing the game

In implementing this game, the starting point was how to create the two fields in which the player and the AI opponent could build, which would quickly mediate to players where structure could be placed. As such I took inspiration from board games such as chess, which has clearly visible fields in relation to where to move chess pieces. As such I created the start field as seen in Figur 56, where the white cubes represents the tile at which constructions can be placed. As to make it easier for players to know which field they are currently about to select, I implemented that a 'raycast' from the mouse down to the white tiles would change the color of a tile to green as seen in Figur 56. If a player then wants to select the green field, he will have to use the left click on a mouse as the tile is green, which will render the tile blue (see Figur 57). Selecting a tile will disable the code making tiles green, as to confirm to the player that the tile has indeed been selected. In case to avoid frustration with wrongly selected tiles, I furthermore implemented that right clicking would dis-select the tile again.

Once a tile has been selected, the UI building menu, as seen in Figur 57, where players can select what to build. In order to further explain the mechanism of the game, the game was implemented to feature the rule set of the game on another UI element (as seen in Figur 58), which is visible when booting up the game, and can be brought forth again at any time. In relation as to how many turns (days) the game should feature, I settled on 60 after several heuristic tests. When a player has selected what they want to build, the selected tile will be set inactive, and depending on what was selected, the place will stay empty (see Figur 59) until the amount of turns have been made which corresponds with the amount of 'days' a construction takes to build. The different buildings, and how they appear when upgraded, can be seen on Figur 57 in the building menu. If a player wants to upgrade a house or a barrack, they can hover their mouse over such a building, and a small GUI

message will pop up stating that clicking will perform an upgrade on the building as seen on Figur 59.
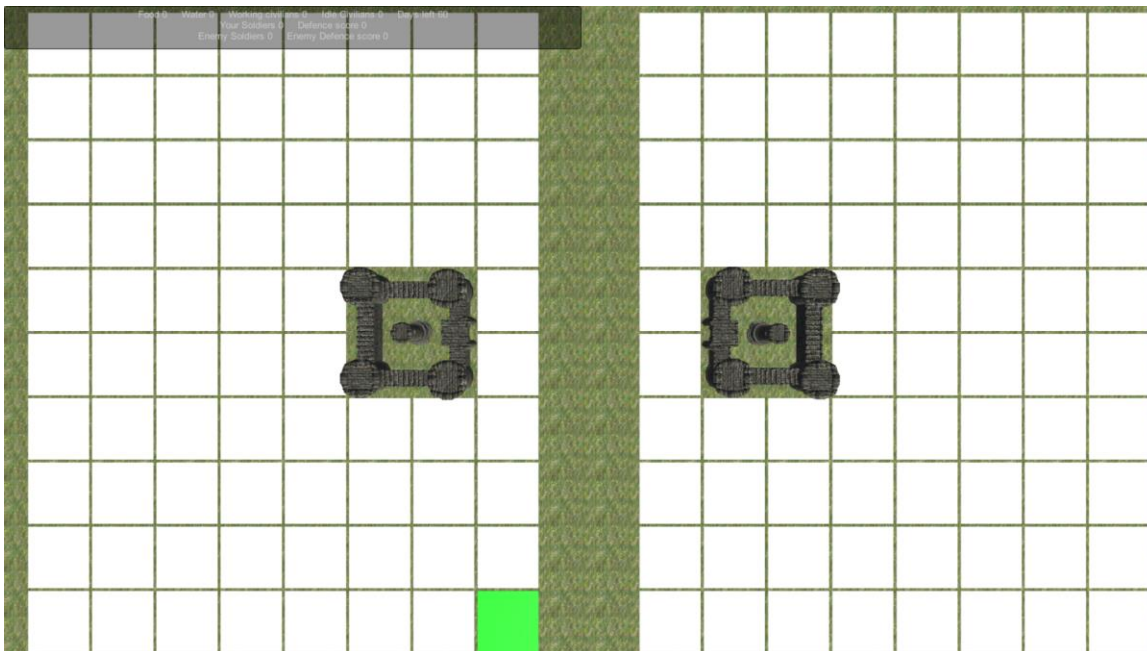
Figur 56 On this screen capture from the game the lineup of the white tiles can be seen, where they create a clear field for the player and the AI to build. The green tile on the image is where the mouse were hovering. Furthermore the two opposing castles can be seen, along with the resource bar in the upper left corner
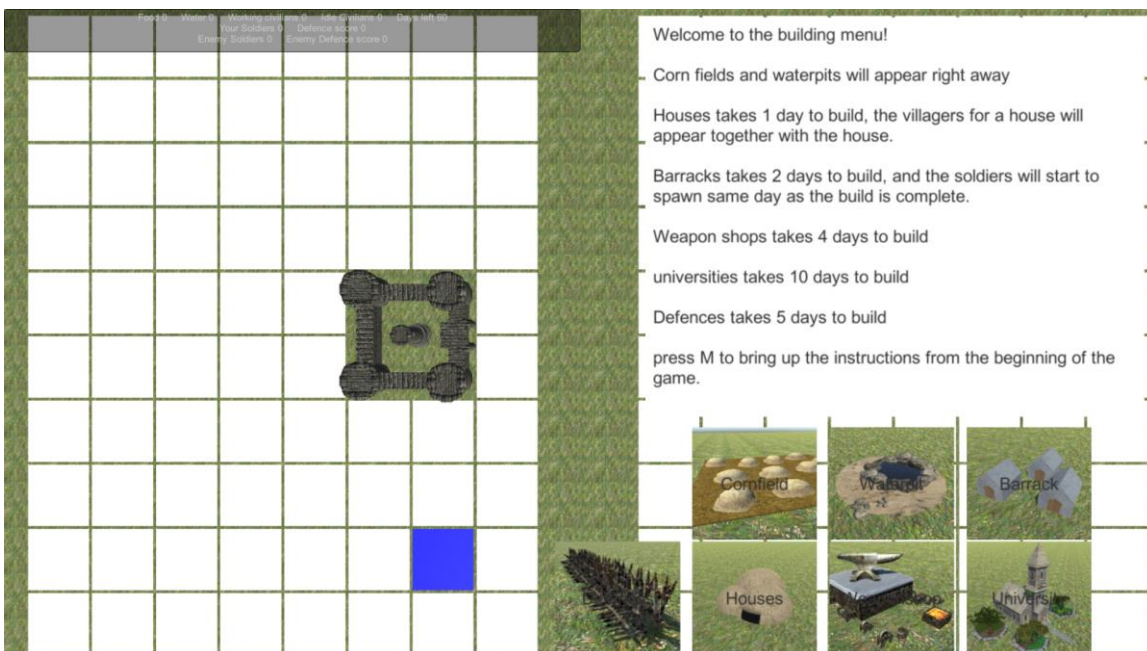
Figur 57 In this image a tile has been selected, and is therefore blue. The building menu is therefore activated, which is the UI elements on the right side of the picture. As can be seen, information is relayed about building time for each type of building, and to further help players, they are reminded that pressing 'M' will bring up the instructions to the game

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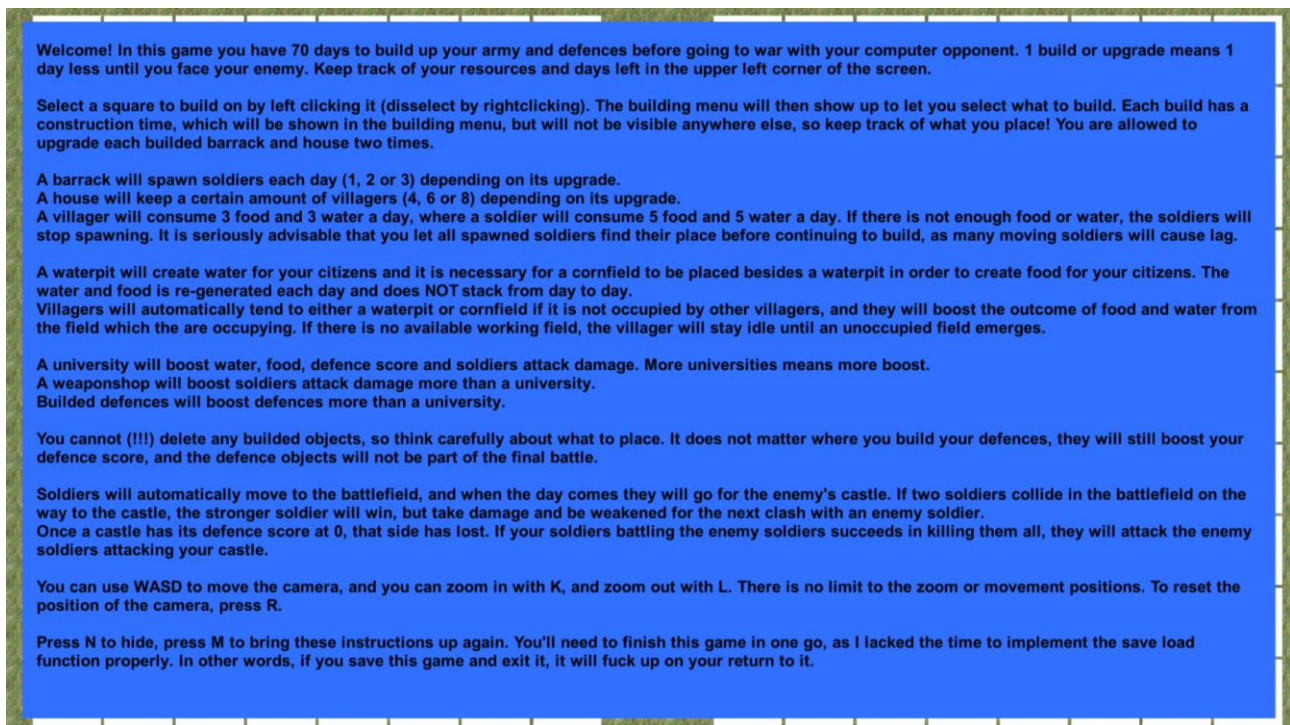
Figur 58 The instructions that is featured upon starting the game. These can be put away by pressing 'N', and brought forth again by pressing 'M'
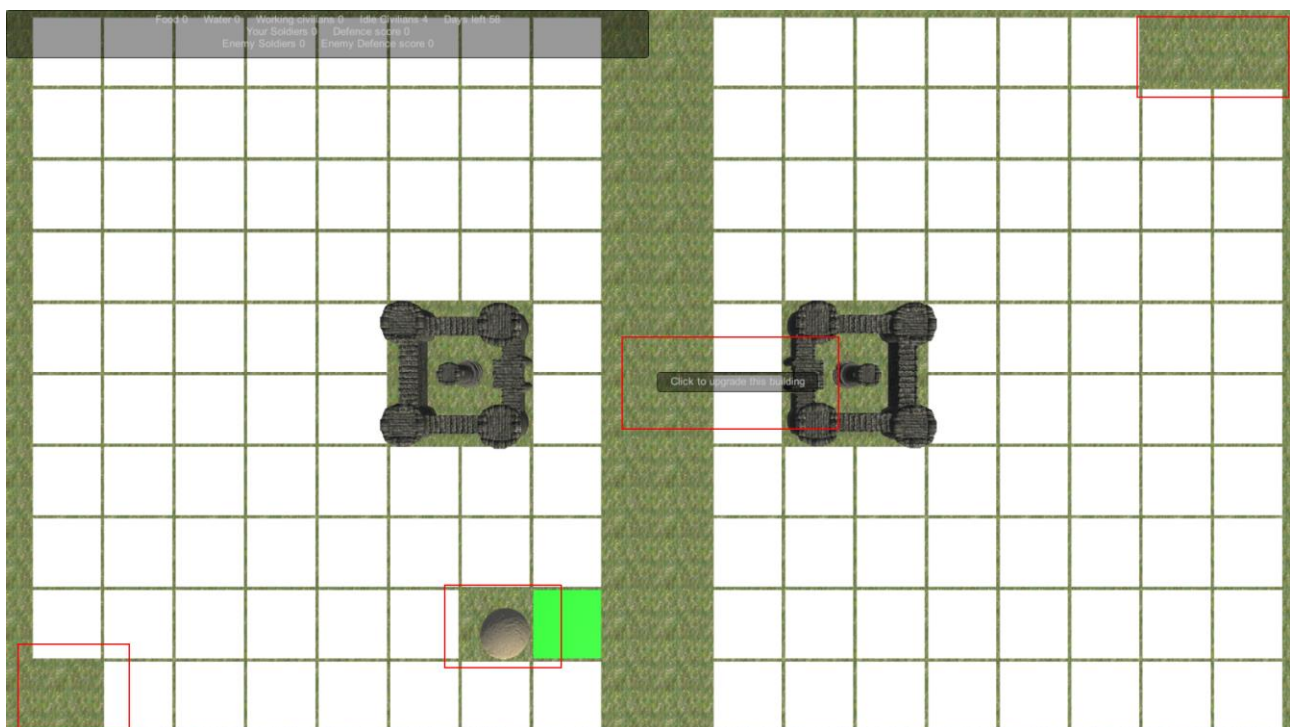
Figur 59 In this screen capture, empty fields waiting for the right amounts of turns for displaying a built construction can be seen, where the tiles selected has been set inactive. Furthermore, the house (marked with a red square) has the ability of being upgraded, and the mouse hovering over it, has activated the GUI box (also marked with a red square) which relays this information

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For further specifications of the constructions that can be created, the following applies:

Corn fields have a base of 3 foods being produced, as long as it has a water pit within its radius. When a villager is tending a cornfield, this outcome grows to 12 food produced.

A water pi generates the amount of 9 water, as a baseline, and 36 water when tended to by a villager.

Placing a defense will render 50 points to the raw defense when the construction time is over.

Weapons shops adds 1 damage to each soldier (i.e. when a player has created a weapon shop, this will add 1 damage for all his soldiers)

The universities boost the stats in relation to how many universities there is. As such, it generates an exponential graph. This means that if a player produced 3 food, then building 3 universities will boost that food up till 9. However, in relation to the troop damage, I implemented that the raw amount of universities should not boost the troops' damage by 1/1, but by 1/2.5 instead. This should make sure that there would be a point in building the weapon shops, in relation to the small amount of extra damage which they provided.

In order for players to keep track of resources, defenses and their opponent's defenses and amount of troops, the following GUI box was implemented to show these stats, along with how many active and idle villagers they have on the field. The reason for including the villagers in the resource management, is because when they are created on the scene, they are initially hidden by the house which they were added at, and can as such not be seen until they mode away.

For the AI I implemented specifically how it should build on the first 12 days (university-barrack-water-corn-corn-corn-barrack-house-weapon shop-defense-defense-defense), where after i had it pick a tile by random. For the random picked tiles, I implemented specific numbers, where if that tile corresponded to a certain number, then a certain type of building was build. If the AI chose a tile field in which an upgradable building had been placed, that building would be selected for upgrades. If any other free tile was selected, the building mechanism depends on how many days remains before the battle takes place. If there is more than 11 days left, a random integer between 1-45 is selected. If the integer is equal to 1, a water pit will be build. If it is in the range 2-4, a corn field will be build. If it is 5-7 a barrack will be build. If it is equal to 8, a house will be build. If it is 9-19, a weapon shop will be build. For 20-29 it will be a university, and for 30+ it will be defenses. When the days drop to be between 10 and 6, the AI can only build defenses and weapon shops. For fewer days than that and up till day zero, the AI will only build cornfields and water pits. The balance of the AI was heuristically tested as to be neither overpowered nor underperforming, but still with a random element to it, as to create e more unpredictable outcome, also in relation to replayability.

The troops that will be spawned in this game will be simple cubes, which are either blue (i.e. the players' troops) or red (i.e. the AI's troops). As can be seen on picture, the troops move to the battleground and line up in two different places. The original reason for the two created lines was that I planned to implement an extra feature in which one line would go for the castle, and the other for the other troops, but due to time limitations this was omitted. I however liked that they lined up

in such way as it created a bit of a difference in the otherwise uniform gameplay, and as such left it be. In an attempt to reduce lag, I furthermore made sure that when a troop had found its place on the battle field, its script would be disabled, which means that the entire battle scene is only controlled from one script (see Figur 60 for how troops line up).
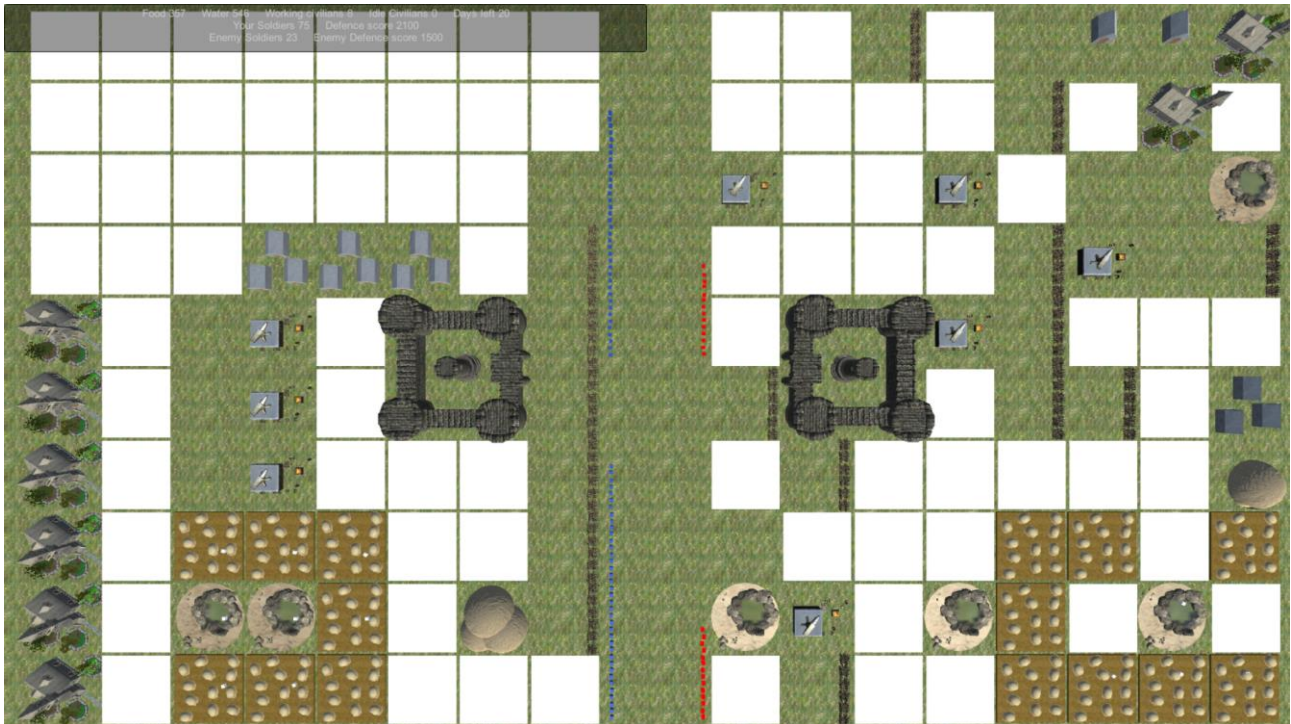
Figur 60 In this picture it can be seen how the buildings appear when built and the lineup of the spawned troops can be seen; blue for the player, red for the AI

When reaching the final day where the battle will go down, I implemented that none of the troops would go to battle, if just a single one of all the troops had not taken his place. This implementation choice was done from the perspective that if not all troops are ready, and if some of them may even have been create farthest back in the ranks of the white tiles, this would be unfair gameplay. In any case, the troop will attack at the same time (see Figur 61), and if they collide on the battlefield, the strongest troop will win (see Figur 62).

In relation having check upon how much damage every single troop does individually, I have created a list in which every in game character is featured, along with an equally long list, which keeps check not only on the damage a troop can deal, but also whether or not a worker is idle or active. As such for each turn in the game, these lists are checked as to see if there are idle workers who can be put to work.
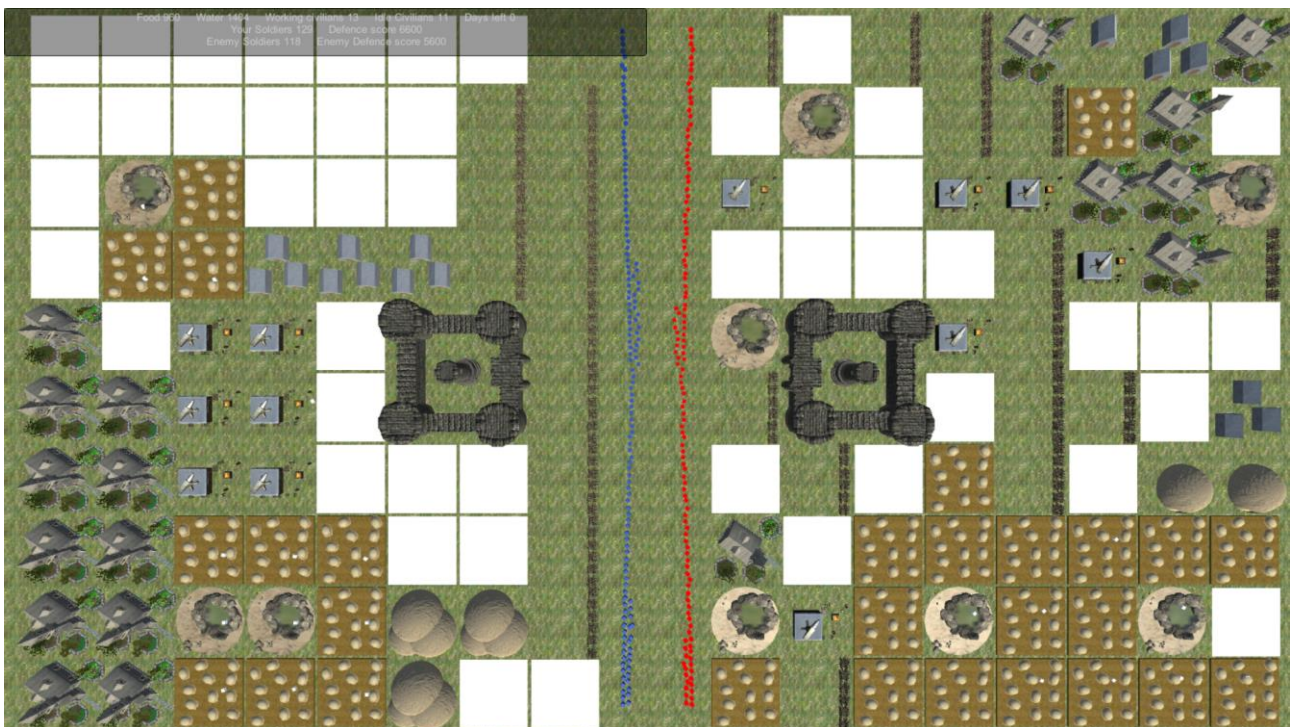
Figur 61 The battle day, and the troops are moving towards the enemy castle
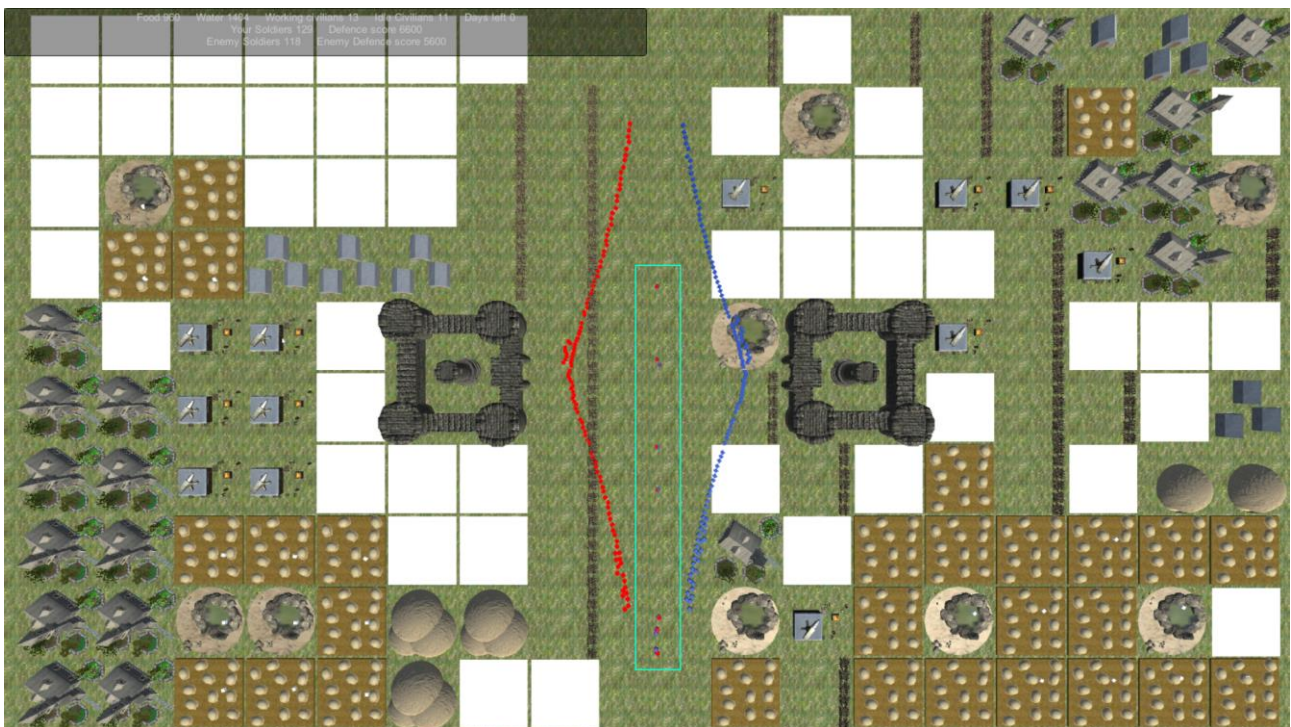
Figur 62 When enemy troops collide on the battlefield, the strongest will survive. The dead troops can be seen in the blue box on the middle of the battlefield

When the final battle runs, it is the proximity to a castle which determines whether or not a troop's damage should be applied in the attack on the defenses. The end of the game is reached when one or

both castles have a defense of zero or below (see Figur 63). This means that there are three end-states for this game. Either the player or the AI wins, or they have both eradicated each other.

Figur 63 The battle is over, and the player won

5.2.3.3 Adding the statements and questionnaires

In this game I have chosen that there should be presented three questionnaires, as there are only 60 turns to make in the game. As such the questionnaires are presented when a specific number of days are left: 50, 25 and 2. The reason for placing the LQ3 before the battle is to see whether or not people are motivated towards the ending, and not if they still can contain their CoDe when the game is over. As for the statements in relation to why a participant rated their CoDe as they did, the following statements were formulated in coherency with the CoDe elements:

I want to solve the game's challenges
I do not like the challenges provided in this game
There are things I want to experiment with in the game
There is not enough experiment opportunities
I want to complete/ win this game
The game does not give me the desire to complete/win it
I want to progress in this game
I just want this game to be over
I want to become stronger in this game
The upgrades are boring
I enjoy construction in this game
I don't like the building aspect in this game

With the above statements in place, we now move over to the 'Achievement' game.

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5.2.4 The 'Achievement' game (Submarine adventurer)

5.2.4.1 Designing the game

5.2.4.1.1 The Gamer Motivation Model aspect

The primary player type 'Achievement' has the two subtypes of 'Completion' and 'Power'. The preferences for these are as follows: Complete every mission, find every collectible, discover all secrets, getting every achievement, unlock everything that can be unlocked, become as powerful as possible by seeking the most powerful weapons and gear.

As such I have chosen to create a game in which the main aspects will be quests, achievements, upgrading power, discovering places and collecting items. As the power in the game needs to be correlated with something a player can actually use their power against, I have furthermore chosen to include enemies. In order to try and create cohesion between the selected aspects, I have chosen that the player will be part of a thieving gang, where they are on a mission to find and collect valuables. As such it will make sense that the player needs to gather objects, and as thieves rarely tries to steal from themselves, it will make sense that they are trying to gather the objects from unknown territory, which will allow for the design of discovery.

5.2.4.1.2 The Self-Determination Theory aspect

When adapting the CAR components for this game, it would appear that this player type may be more into a high level of 'Competence' (as to satisfy their need for power) and 'Autonomy' (as to satisfy their ability to complete/collect/discover everything in the game). The component of 'Relatedness' in relation to this player type would seem to be adequately fulfilled by allowing the player the opportunity to use their powers, which would be provided by killing the enemies already chosen to be featured in this game. For the 'Competence' I will try to design for easy controls and tasks, and for 'Autonomy' I will attempt to create a design which will not make it difficult to complete all the content that will be provided in the game.

5.2.4.1.3 The Continuation Desire aspect

The main aspects chosen from the CoDe 'Activities' are 'Sensing', where the secondary 'Activities' chosen are 'Exploration' and 'Destruction'. The 'Sensing' aspect was chosen from the perspective that for this player type they want to continue to the very end of the game, and as such the game should allow for them to have interesting visuals while they are collecting and discovering everything. As such I have decided for the following design choices: There will be visual feedback for each time an achievement is earned, their in-game character should be more interesting to look at (rather than just spheres and cubes as argued earlier 5.2.1.1.4 The design choices), things that can be discovered should have rather complex look as to not be boring to observe and this should also relate to other in-game objects. For the 'Exploration' this can simply be done by allowing for several sites to be discovered, where the distance between them should be larger than the diameter of the sites to discover and for the 'Destruction' this can be achieved with the enemies which have already been chosen to be featured in the game.

5.2.4.1.4 The design choices

As such the specifications of the design can now be made. As already state I have chosen that the players should be part of a thieving gang, and as such the game needs to have some story elements to convey this. Therefore I chose to create the following story: The player is one of (at least) two adult brothers, who are in the thieving business along with their parents. The family has heard of a rich eccentric man who has died recently, and therefore they have traveled to one of the rich man's properties in order to raid it. The property chosen by the family is a valley which has been flooded where they assume that they can find leftovers and other valuables left by the eccentric rich man. The brother, whom the player takes the role of, has been put into a small submarine in order to investigate the flooded valley, while the rest of the family is controlling some unspecified hardware that will make it possible for them to retrieve valuables from the valley. The player enters the game as the submarine is already under water, and the other brother is trying to give instructions on how to run it.

The instructions as how to control the submarine will be given in a dialogue which presents the submerged brother as a not too bright individual, which has the above surface brother trying to relate the controls of the submarine in regards to video games the submerged brother plays. As such I have chosen to relay the game controls to the player, where an example of this is the following pieces of dialogue that will be featured in the game:

"*Just... Imagine that it is a game right? You remember brother? The steering is just like in one of your games, W for forward, S for backwards, and the button on the left is for short speed boost, like when you press the left shift button. And just hit the big red button to shoot, like, when you press the right mouse button right? And right in front of you is the... pick up items button, yes... you know, just like when you press E to pick up something in your favorite game right? Hey, you can even pretend that pressing R will show you quests and achievements if you want...*"

During the game the player will receive messages from the above surface brother, who will give quests and instructions on how to proceed, as to keep the coherency of the story and to move the players along. The further choices for presented dialogue will be presented in the implementation section.

The player will be given the ability of upgrading in this game, where I have chosen that what can be upgraded are the following features: speed of the speed boost, time in relation to how long a speed boost at maximum can last, faster reload speed for the shooting mechanism, more damage from shooting, higher health, faster healing and a sonar. The reason for not giving the players unlimited speed boost time, instant reload and a sonar is from the perspective of the 'Power' element, where a player should feel that they progress, and the easiest way to make them progress is to impose limits on their actions which can be removed through progress. As such I chose that the players should feel somewhat weak in the beginning of the game, as this will allow for a feeling of power when they gradually remove the limitations put on their gameplay.

For what to be found, I have chosen to have two different types of locations: items/creatures kept inside very large glass bubbles, and ruins of buildings still standing after the flooding of the valley took place. The enemies in this game will be a type of giant fish that is contained by one of the glass bubbles. There will be five of each type of location.

It will be mediated to the players that the ruins may hold something of value and as such the players will need to explore them. As to keep the content of the game down, the ruins in the valley will not have anything that the thieves can use/collect, and as such the ruins will mostly be related to the 'Power' aspect of the player type, where the discovery of ruins will trigger the possibility of upgrading player features. For the five glass bubbles I have chosen that not all of them should feature something of value in relation to the mission the player is on, but regardless of what is inside a bubble, the player will still be able to pick an upgrade upon getting to one. For the specifics of the bubbles and what they should contain, this will be specified in the implementation section as to already existing game assets that can be found and used for this game.

In relation to the achievements that can be earned by the player, these will first be designed when the rest of the game content is set, as to customize them to fit this content. Hence, the implementation section will feature a description of the achievements. I have, however, already decided that there should be no less than 20 and no more than 30 achievements which can be earned in the game.

As a further design choice, which is related to the need for the player type of discovering secrets, I want to include a flock of whales which swims around in the valley. The whales will not be mentioned unless the players actually stumble upon them, and as such, they should be a neat little secret for the players to discover.

5.2.4.2 Implementing the game

As this game was set to be an underwater game, it was important to try and portray the low visibility under water and recreate a feeling of being under water. As such three things were implemented. Firstly a script, featured by UNITY called 'Global Fog', was put onto the players' character camera. This fog limits the visibility by creating a visual effect of what appears to be fog. The fog was then set to have a blue color, along with the normally white 'Directional' light, which created blue surroundings. In order to try to counter for lag, the camera rendering distance was set lower, but this also meant that the horizon in the scene can be seen, instead of the created environment (see Figur 64). As such two quads (given the same blue color as the others see Figur 65) were placed above and in front of the camera, which would make sure that when looking in these directions, only blue should be seen. With this created, the visual atmosphere of being underwater was created.
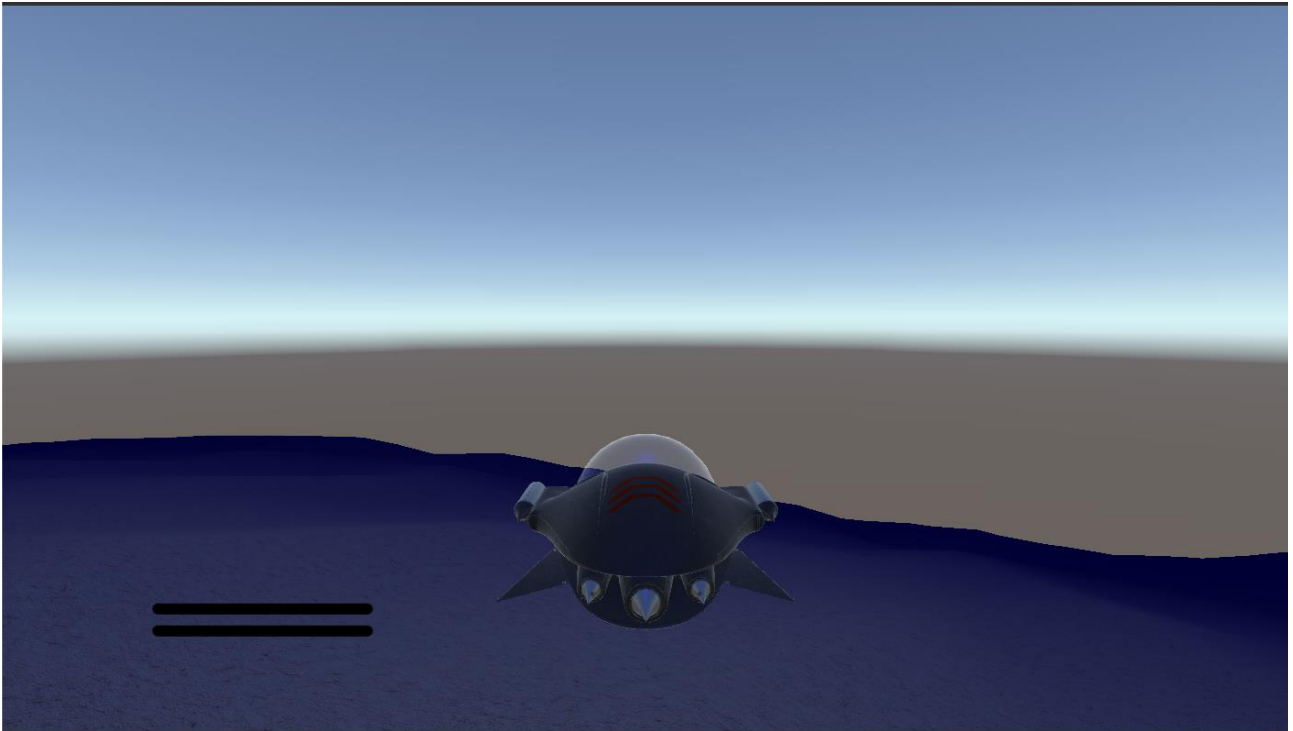
Figur 64 This image shows the chosen character downloaded from the (Unity Asset Store, 2017). As can be seen, the light has been given a blue color, and the fog element can slightly be seen. Due to the rendering distance for the used camera, the environment makes a sudden stop, and the environment makes a sudden stop, and the horizon can be seen
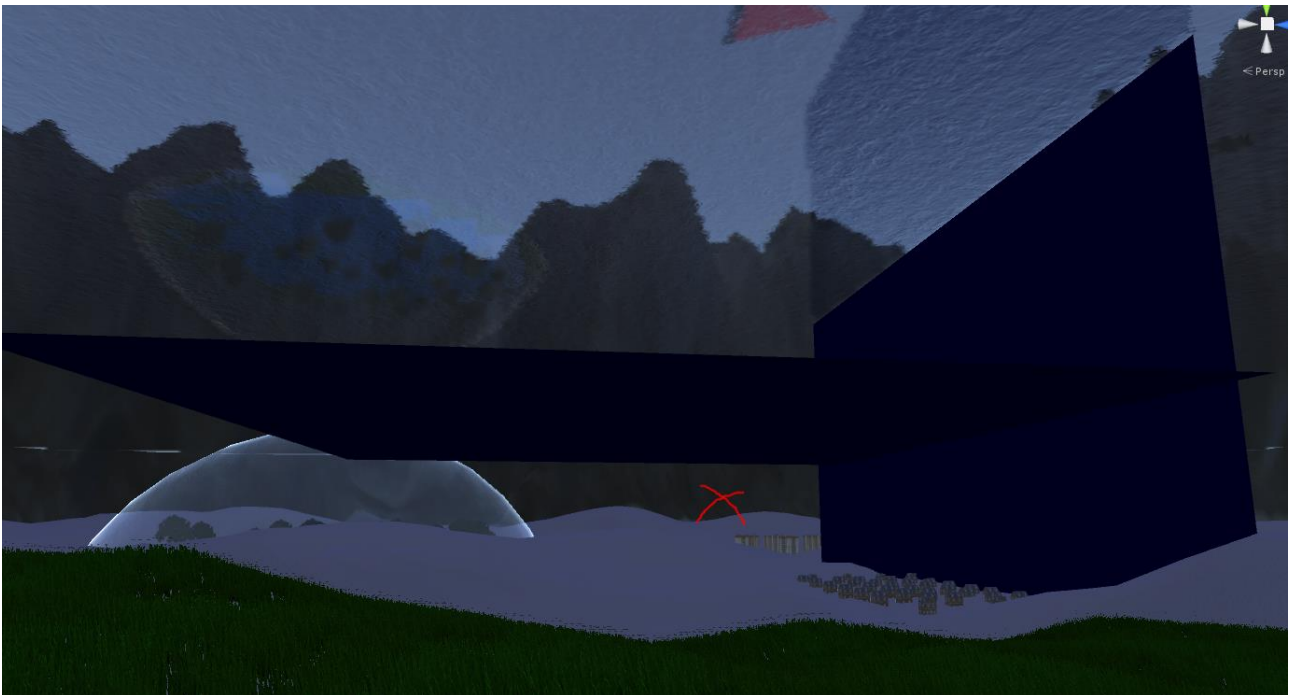
Figur 65 On this image the two quads which are meant to block the view of the horizon is seen. The players character is roughly placed by the red X, facing right

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The visible character for the players was found online as in accordance with the design choices and fitted well in with the theme, as can be seen on Figur 64. The created environment can be seen on Figur 66. For the representation of is being a valley, high cliff sides were created, and in order to hint at the eccentric who flooded the valley, a 'dam' (see Figur 66) to give the impression that it keeps the water inside.

Figur 66 This image is a screen caption taken from above the created environment. The 'dam' in the game is marked with a red square, the 'glass bubbles' are marked with green squares, the ruins are marked with yellow squares, and the flock of whales are marked with a purple square. As can be seen, there are high cliff sides, which marks the valley

As can be seen on the created environment (Figur 66), there are four bubbles and five ruins created. The ruins (see Figur 67) were made with building structures as found on the (Unity Asset Store, 2017). For the bubbles, a type of space ship was used en masse in a small sized bubble (as seen on Figur 68), where a larger bubble contains what could be called a landside environment with trees and cows created for this project (see Figur 69). The one of the two larger bubbles contains the fish (see Figur 70) that was implemented to be used for the enemies described in the design choices, and the other and last of the bubbles contains a 'fortress' with a golden statue inside, and sail ships in close proximity (as seen on Figur 71).The whales that were described as a design choice was implemented a small flock of five (see Figur 72), and instead of being living animals, the story around them became that they are mechanical objects put in the flooded valley for fun by the eccentric.
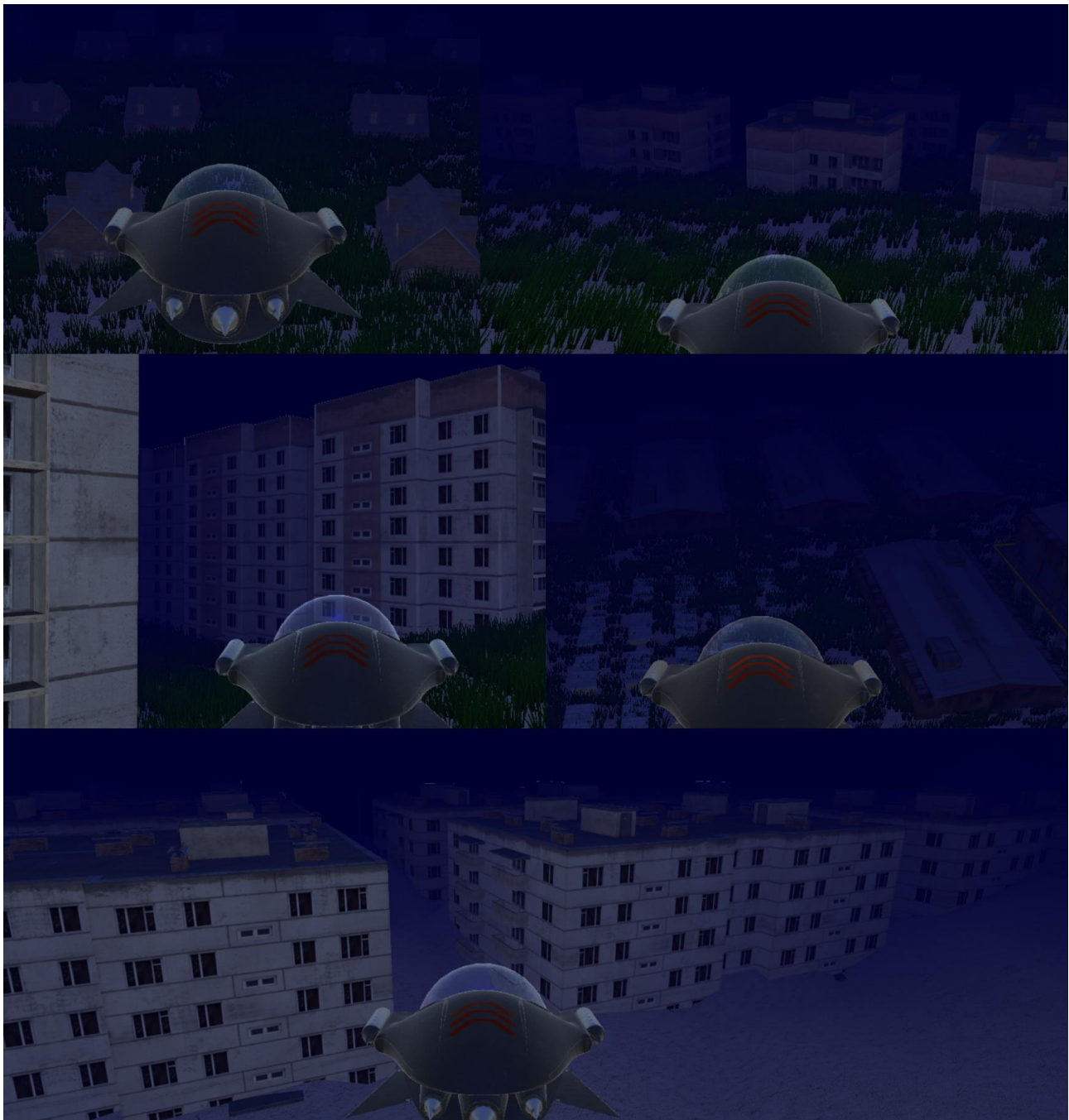
Figur 67 On these screen captions the five different ruins can be seen. There are three apartment ruins, one suburban with smaller houses, and on sight which should look like a construction site

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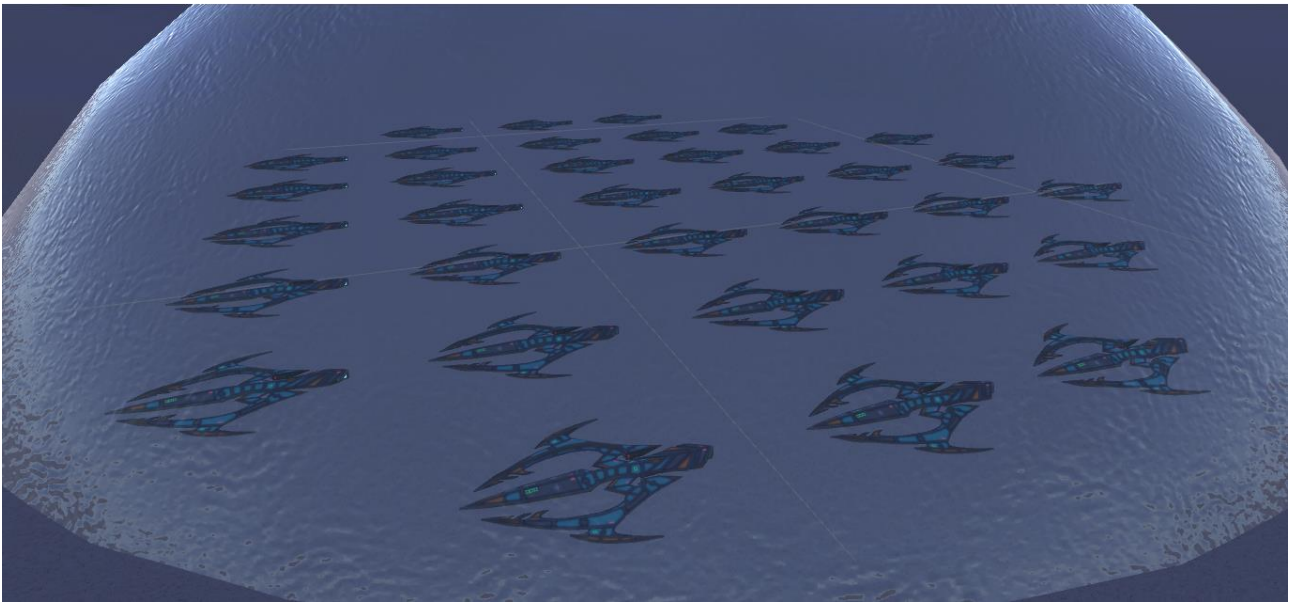
Figur 68 In this glass bubble the space ships were placed neatly on rows as to indicate a form of collection

Figur 69 This is a screenshot from the editor where the environment inside the bubble containing the cows can be seen. The white spheres on the trees are light probes, and are not visible when playing the game

Figur 70 A screenshot of the bubble containing the fish, that will attack the player. Since the player is not able to see inside the bubble due to the camera rendering distance, there was no reason to make the fish do anything inside of the bubble, and as such they were simply placed in rows
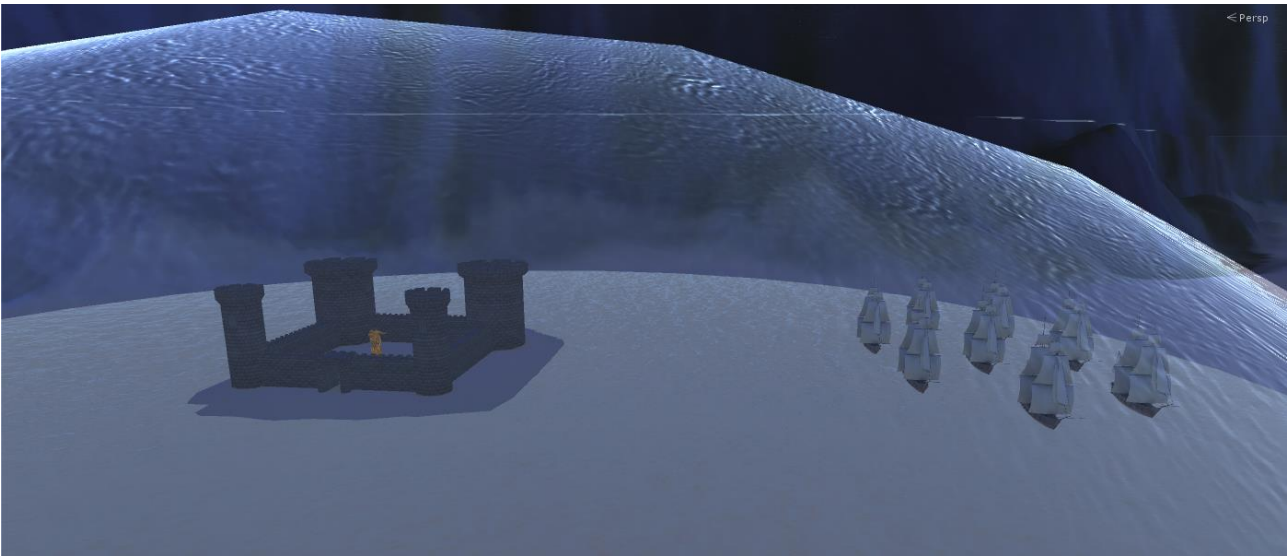
Figur 71 In this image, the castle surrounding the golden statue can be seen, along with the sailing ships. The bubble was furthermore given an extra water layer, as to indicate that the eccentric who owned this place, had fun playing with real life sized objects, in some form of sea battle scenario

Figur 72 This image shows the small flock of five whales, which has been set to swin around in the valley

For the achievements in the game, a total of 23 were added. The following Table 2 will describe what had to be done to earn an achievement, and what it was called. For reference to how they were (hand)made, see Figur 73, where the described achievement will correlate left to right, top to bottom.

Figur 73 How the achievements' looks when earned

Table 2 The different achievements' names and how a player can earn them

'Cow Killer' Earned when cow bubble smashed, which kills all cows (see Figur 74).	'Blubber Harvester' Kill a whale	'Japanese scientist' Kill all whales	'This is not an echo chamber' Destroy a glass bubble	'Like an elephant in a pottery store' Destroy all glass bubbles	'Gone fishing' Kill one fish
'Screw food variety' Kill 50% of the fish	'Fish quote? What fish quote...' Kill all fish	'Pet-killer' Obtained by getting: 'Cow Killer', 'Japanese scientist' and 'Fish quote? What fish quote...'	'Just a bit of technology for space...' Gather one space ship	'Hoarder' Gather all the space ships	'Golden touch' Gather the golden statue
'Discoverer' Find one city ruin	'Call me Dr. Livingstone' Find all the ruins	'You sunk my battleship' Gather one sail ship	'Columbus is outdated' Gather all the sail ships	'An Apple a day' health and speed of health regenerating upgraded once	'Practice make perfect' Upgrade faster fire, and more damage once.
'Beep-beep' (Created after the old cartoon of 'Roadrunner') update speed for speed boost once.	'Consequences are for losers' Shoot at the dam once	'Down boy, down!' Try to swim up to the surface	'Back when I was alive' Get killed once (there will be no penalty for this death)	'Completionist no-life Diploma' Get all the other achievements to earn this one.	

Figur 74 When destroying the bubble containing the cows, they will be given a death face and start to float around, as can be seen in this screen capture

When starting the game, a design choice was made to include a brother character who would guide players as how to play. For this, simple GUI boxes were used, and the dialogue presented to the player can be seen in Figur 75 and Figur 76.
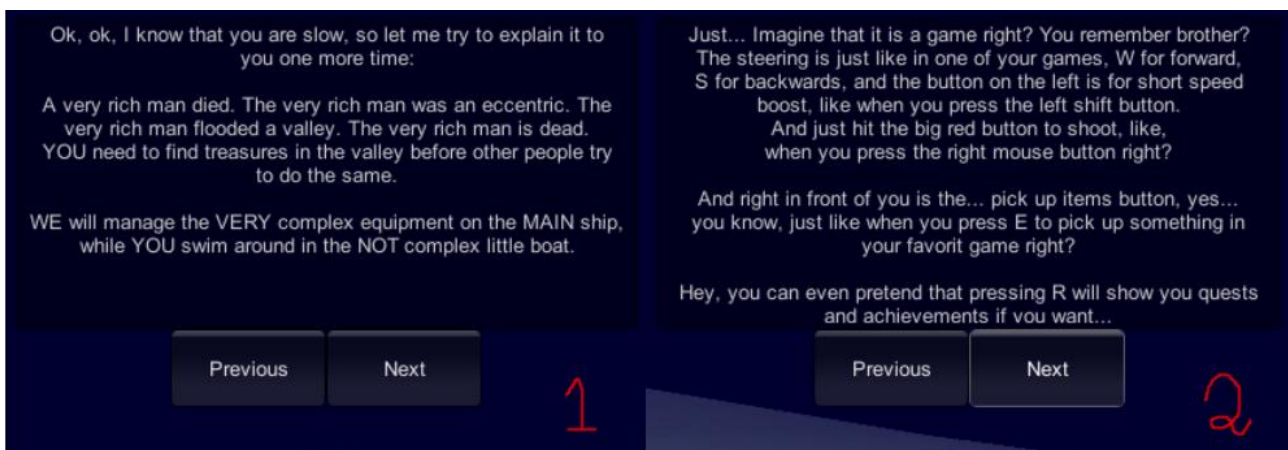
Figur 75 Dialogue boxes 1 and 2 received from the brother character
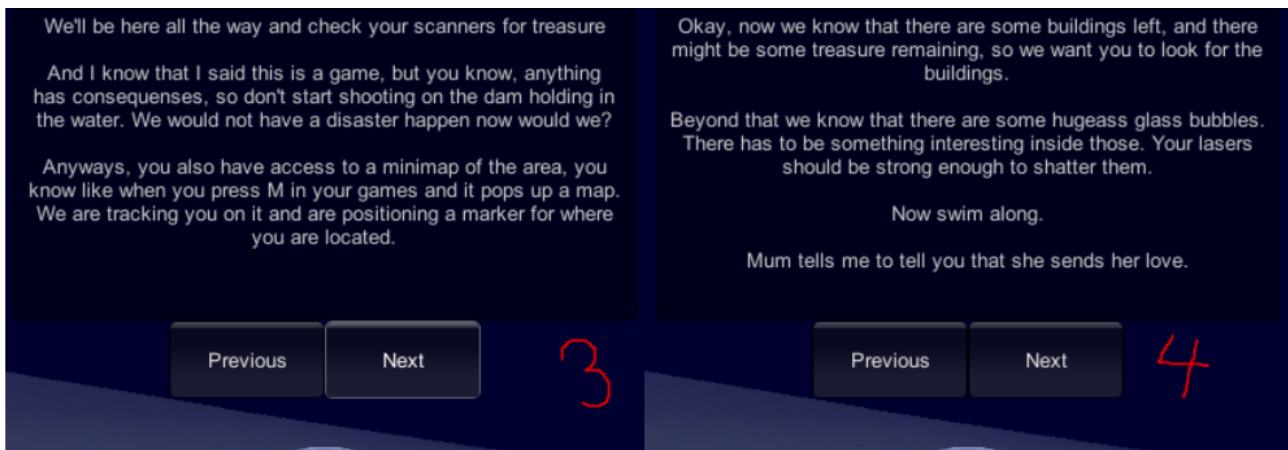
Figur 76 Dialogue boxes 3 and 4 as given by the brother in the beginning of the game

The quests created for this game included the following:
Destroy the bubbles and investigate bubble areas
Collect the golden statue
Collect three sail ships (explained as being advanced illusionary objects
Collect five space ships
Investigate all ruins.

Upon completing any quest the player is able to upgrade. The upgrade panel can be seen in Figur 77. The sonar in this game was created in a similar manner to the 'Action' game, where the mini-map cam would be able to render colored dots (see Figur 77), while the main camera was not. As to appear as being a sonar, the dots would be created above an item, and then disappear slowly, before a new dot would be created. The dots would not move after creation.

Figur 77 An image showing the upgrade menu, the mini-map, and the active sonar dots. Red dots indicate living things, black is dead previously living things, and purple is something of value (e.g. the golden statue)

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The end of the game is reached when all quests and all achievements have been completed. Upon doing this, a simple GUI box will tell the player that there is no more content to have in the game.

5.2.4.3 Adding the statements and questionnaires

For this game I have chosen four different places in which participants can activate the questionnaires. The first is when the first bubble is destroyed, the second is when the gold statue is picked up, the third is when ten achievements have been earned, and the last is when all the RQ2s have been taken, and a participant kills a fish. The reasons for these places is that firstly, the destruction of a bubble is the first indicator of maybe finding something, secondly, when collecting the gold statue, the CoDe for the 'Achievement' type should be high as they like collecting stuff, thirdly as it is a game for achievers, earning ten achievements should also prove a high CoDe if the game works as intended, and fourthly, the 'Power' element can be tested on the fish. As for the statements the following were formulated in coherency with the CoDe elements:

I want to solve the game's challenges
I do not like the challenges provided in this game
I want to explore the game's environment
I don't like exessive exploration
The game allows for enough exploration oppertunities
There is not enough to explore
I find the story compelling and well told
I hate the story it should be different
I am curious to see how the story will develop
The story is boring
I like the way the story is revealed
The game would be better without the story-element
I would like to see more to the characters
I find the characters boring
The characters amuses me
I want to kill all/some of the characters
I want to continue so I can earn more achievements
Earning achievements is boring
I like the amount of achievements
There are too many achievements
I like the created achievements and their design
I find the created achievements boring
I want to complete/ win this game
The game does not give me the desire to complete/win it
I want to progress in this game
I just want this game to be over
I want to become stronger in this game
The upgrades are boring

With the above statements in place, we can move on to the 'Immersion' game.

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5.2.5 The 'Immersion' game (The cursed land)

5.2.5.1 Designing the game

5.2.5.1.1 The Gamer Motivation Model aspect

For the primary player type of 'Immersion' the two subtypes 'Fantasy' and 'Story' was generated. In this regard the preferences of these are the following: Finding enjoyment of being immersed in an alter ego in an alternate world, exploring a game's world for the sake of exploring it, needs games to feature elaborate stories and personalities.

In relation to the above I have chosen for this game to be a story-heavy game, in which there is not much else to do than unravel the story through exploration, while being introduced to different characters. As such I have also chosen that this game should feature multiple endings as to furthermore offer for immersed players to select their own ending. The story in this game will be something that needs interpretation on the players' parts as to accommodate for the aspect of an elaborate storyline.

5.2.5.1.2 The Self-Determination Theory aspect

For the CAR elements in this game the 'Autonomy' and 'Relatedness' components seems to be the most important aspects. The element of 'Competence' should be considered, in relation to this player type, as being related to game controls which are easy enough for them to be mastered quickly, such that they do not interfere with the experience the player is having with the game, as they are more interested in story and exploration than mastering difficult controls. This game should allow for high amount of 'Autonomy' for the player in order to allow for them to explore, and as such there should be as few obstacles as possible that can limit them. In terms of the aspect of 'Relatedness' the in-game characters and the character which the player plays as, it is important that the player can relate themselves to the story and all the characters, and as such it will be the story element that should provide the feeling of 'Relatedness. Naturally, in accordance with the player type the environment also needs to substantiate the 'Relatedness' aspect, and as such it should be an imbedded part of the story featured in the game.

5.2.5.1.3 The Continuation Desire aspect

For this game the primary 'Activities' of 'Exploration', 'Experiencing Story' and 'Experiencing Characters' have been chosen. There are no secondary 'Activities' chosen. The chosen 'Activities' aligns well with the description of the player type, and as such does not need much elaboration.

5.2.5.1.4 The design choices

The design choices for this game will all revolve around the story that will be mediated to the player, and as such this design section will be mostly concerned as how to structure the story and character, as to also create a game in which it makes sense to feature exploration.

The main design towards the story was built from the idea that a village lying close to a wall would have an adventurous villager residing in it, who wants to explore what is on the other side of the wall. The other villagers are not adventurous and would rather just continue on living as always. The

adventurous villager would then travel to the other side of the wall, in which a terrible secret would be discovered by him. This will create the need for the villager to take some action as to avoid a catastrophe to take place in his village. As of this, the specification of the story and the related characters will be described in the following in chronological order, but not in the order in which player will experience the story.

At some point in time the land behind the wall (forwardly referred to as the cursed land) was the same as the land in front of the wall (forwardly referred to as the village). The wall did not exist at this point in time. A wizard came to the cursed land in order to rob it for everything of value. The source for the wizard's magical powers resided in a scepter which he owned. However, the people of the cursed land would not give in without a fight, and as such the wizard cast a spell creating a poisonous black fog which spread throughout the cursed land. After this the wizard furthermore called forward a monster made out of dirt, which would devour all encountered people in the cursed land. The wizard's scepter kept him safe from the poisonous fog, and gained him control over the monster. Three villagers from the cursed land fought back however, and managed to rob the wizard of his scepter. The wizard fled however and was not defeated. As the only survivors from the cursed land, the three villagers built a wall to block of a mountain passage in order to contain the monster and the black fog, and created a village on the other side of the wall as to ensure that the wall would be maintained to keep the rest of the world secure from the dangers of the cursed land.

Fast forward about 130 years, and one of the descendants to the three villagers wants to explore the cursed land. The descendant is in possession of the wizard's scepter, but is unaware of its powers, and simply regards it as a fancy walking cane. The wizard has at this point returned as a new resident of the village, although he is not aware where the scepter is, he is aware that it must be somewhere in the village. The wizard establishes himself as a librarian running the local library. The descendant frequents the library many times in order to gather literature about the cursed land in order to prepare him for the trip, and during his investigations he comes across the legends about the cursed land, and a hand drawn map over the area. As the descendant leaves the village to explore the cursed land, he takes the scepter with him and leaves his pregnant wife behind with the promise to return again. He also carries an invention of his own, a pair of goggles, which he designed as to better see in fog.

Upon exploring the cursed land the descendent takes notes about what he finds, but he is not always too careful about the notes, and drops them in the various locations in the cursed land. He starts his journey in the cursed land by setting up camp in an empty cave. From here he travels on to the locations specified on the map, which includes another empty cave where he sets up a second camp, two villages laying in ruin, an old prison and a graveyard. During his exploits of the cursed lands he finds nothing of value, and also ends up losing the scepter inside the prison. As he lost the scepter, he also lost the only thing protecting him from the fog and the monster. He eventually figures out that the curse is a real thing and what the scepter is capable of, along with discovering that not only is the new librarian the wizard, that the monster still exists and has laid eggs in the prison. He furthermore finds a secret passage through the mountain cliffs that leads from the cursed land into

his village. He realizes that the wizard intends to bring the eggs to the other side of the wall, and that the wizard wants his scepter back. As such the descendant writes his last note in which he explains that the new villager is the wizard, his discovery about the scepter, the eggs, the wizards plan and the secret passage, before he sets out to destroy the eggs and hopefully find and destroy the scepter as to stop the wizard. In his hurry to go and destroy the eggs, he forgets to put on his goggles, which are left in the first cave where he set up camp, along with the hand-drawn map of the cursed land. The descendant fails and dies without completing either of his objectives. The wizard cannot control the monster or survive the poisonous black fog without his scepter, and as such is still stuck in the village at the wall where he waits for another fool to go in and retrieve his scepter for him.

Fast forward 20 years (this is where the player comes into the story), and the son of the descendant has grown into an adult. His mother committed suicide several years earlier by drowning herself in the ocean. However, during the time she was alive, she kept telling her son about his dad, the great explorer. During this time the wizard is still acting as the librarian in the village, the son has a friend named Bob and there is a new mayor which has been elected. Incited by the same instinct as his farther, the son wants to explore the cursed land. As it is against the law to build ladders or anything else near the wall, and since the son does not know about the secret passage, he figures out a plan in which he want to build a giant slingshot as to get over the wall. This leads to him needing to firstly gather information about the cursed land and how to build slingshots, by consulting the wizard, secondly to talk to a carpenter to gather wood, and lastly to talk to the mayor about his plan. The wizard is not interested in giving much information to the son, and hence burns up many of the documents before leaving the son with some hard-to-read old myths about the cursed land. After packing and building the slingshot, the son gets ready to fire, with Bob being the only spectator as the son is widely regarded as a freak by the village. Bob gives a parting gift of a stone licked by his favorite cow, since Bob is also an odd soul like the son.

The slingshot works as intended and sends the son over into the cursed land. As he does not have anything to improve his sight in the black fog, he cannot see where he is going. By dumb luck he stumbles into the cave where his father had set up the first camp. As such he finds the goggles, the map and some notes. The map prompts him to try and search the different locations, at which the notes from his father are still lying around. The monster still roams the cursed land, and as such will chase the son if it gets his scent. By reading the notes the son finds out about the eggs, the wizard and the scepter, however, he makes the mistake of thinking of the last new villager in the town, which is the new mayor, and as such first believes him to be the wizard. The son then tasks himself with the mission of destroying the eggs and expose the wizard. After successfully destroying the eggs which are located in the old prison by using the rock he had previously gained from Bob, the son will head for the secret passage to get home. This will lead to the twist of him being met inside the secret passage by the librarian who exposes himself as the wizard.

(This is where the multiple endings are constructed)

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In the first scenario the son does not find the lost scepter, and when he meets the wizard he succumbs to the poison from the fog, and is left to die in the passage, as the wizard returns to the village.

In the second scenario the son has found the scepter upon encountering the wizard, and is presented with three different options: giving the wizard the scepter, destroying the scepter or using the scepter on the wizard. In relation to the first option, the wizard has told the son that he (the wizard) is the only who can save the village from the fog and the monster, if the son would just hand over the scepter. The second option is related to his father's whish of destroying the scepter, and the third option is related to revenge on the wizard.

- If the scepter is handed over to the wizard he will summon the monster from the cursed land to kill the son, and as such he can then retrieve the eggs and return to the business of destroying the world.

- If the scepter is broken the wizard will be angry but ultimately without any significant powers, and tells the son that he has doomed the entire world, before he teleports away to an unknown location.

- If the son uses the scepter on the wizard the monster from the cursed land will appear and devour the wizard. The son then has the power to ban the monster, and lift the black fog.

If option two or three is chosen, the son can hereafter return to the village, where he can tell Bob all about his adventure.

As a small extra adaptation to the story, the son will also be allowed last conversations with the mayor and the carpenter, even though this will not do anything about the main story, but it may render some closure for players that they are able to revisit all previously encountered characters.

As the designed story is in place, I made some further choices in relation to how the characters should be portrayed both in terms of the visuals, and in terms of showing the personalities of them. The visuals oaf all the people living in the village will be that of a regular unity sphere, but they will all have facial expressions, much in the same way as the characters in the 'Action' (Mercenary) game. However, as there are different characters, I have made the choice of also introducing hair on the characters, as opposed to the villagers from the 'Action' game. Hence they will be given more individuality. For the personalities, I only have to generate one for the following characters: The main character that is controlled by players, the main character's friend Bob, the wizard, the carpenter and the mayor.

The main character (i.e. the son of the descendant) will have a carefree attitude without much logical thinking, will completely disregard his own safety and will generally not understand sarcasm, irony or other underlying meanings when having conversations with other people. The design choice

for this character also lead to another aspect for this game: all the villagers, except the main character, will have a nametag over their heads. This design choice was firstly linked with the thought that players should be able to quickly know which characters to talk to. However, due to the personality of the main character, the texts on the nametags are explicitly linked to what he thinks about them, and it will be presented to the player that they are figures of his imagination. This presentation will occur in relation with the carpenter character, whose real name will be Jim, but the nametag will state that his name is John, and he will be called John by the main character. As a further nudge to this, the end of the game (if the player chooses on of the options that lets the main character come back to the village) when the carpenter is spoken to, the main character will state that he (the main character) will have to change the nametag.

Bob is like the main character a bit odd, but this comes to show in other ways. He has some fascination for the cows in the village which will underlie his strange personality. Bob is a simple man who does not have great plans which he want to carry out in life, but he is a faithful friend and are capable of more logical thinking than the main character.

The wizard will be an old man at the point in the story where the player enters the world, and as such he will not feature a personality with what could be called an edge, but he will be shown as a deceptive person who takes things as they come. He has time to wait for them to happen.

The new mayor will be featured as one who is aware that he needs to treat people politely as if he did actually care about them, however, he is a person that is more driven towards power, and as such he does not really want to interact with the main public. Although a driven politician, he cannot entirely hide the fact that he does not like people, when persons such as the main character want to talk to him.

The carpenter is a regular guy, who does not mind the main character at all. As such he is an easygoing guy who is happy as long as he gets money for his work or materials, and does normally not judge other people. He does has a limit though in terms of how much nonsense he will tolerate, but he will try to shrug of the main part of his frustrations as to avoid conflict.

As such the design of the story and the characters were made, however, there were an extra design choice as to the environment. In order to establish a substantial contrast between the normal land and the cursed land, the normal land will appear fertile with trees, bushes, corn and the like, where the cursed land will appear unfertile by being portrayed as a desert with no such things as plants. In terms of the buildings of the villages inside the cursed land and outside it, the outside buildings will be more in the style of small white houses, which design can be correlated to modern day houses, only they will be much simpler in design. The cursed land villages however will be more referable to clay houses such as to establish the visual narrative that the current world in the game has evolved.

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5.2.5.2 Implementing the game

The environment of the game was created as shown on Figur 78. The structure of the gameplay pretty much follows the story told above, where the players enter the world. The villagers of this game reused the facial features from the 'Action' game, although they are spheres instead of cubes, and have added drawn hair on them (see Figur 79 for example).
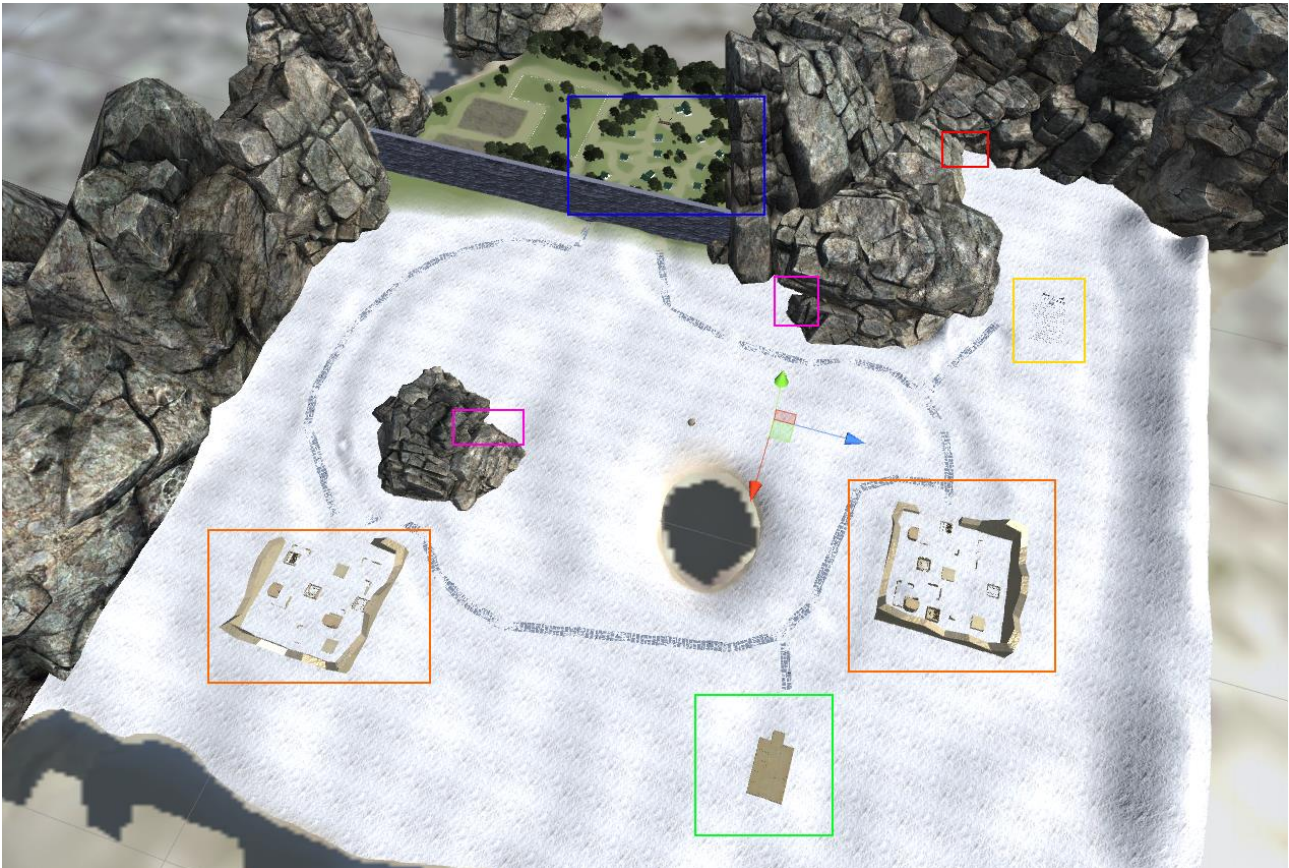
Figur 78 This is a screen caption of how the environment was created. The red square is where the secret passage that can connect the village and the cursed land. The blue square is marking where the village is placed, and the two orange squares mark the two village ruins in the cursed land. The yellow square is where the grave yard was placed, and the green square is the prison. The purple squares mark where the entrances to the two caves are located.

The villagers in this game were programmed to move in a specific pattern cycle. The cows (see Figur 80) featured in the game had, on the other hand, a randomized cycle consisting of a random direction to rotate, a random amount of time to move in that direction, and a random period of how long they should stand still before repeating this pattern.

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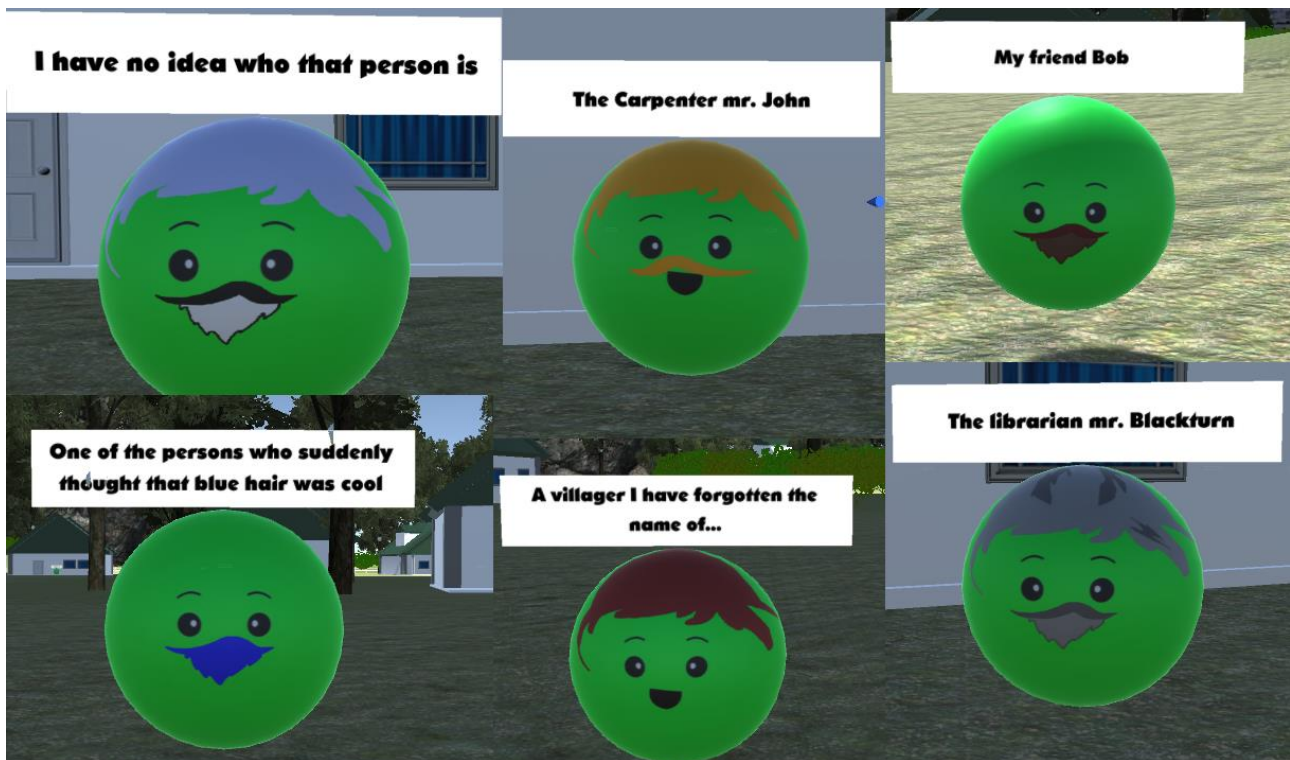
Figur 79 On this screen caption some villagers can be seen, where their texture was originally made from the facial expressions used in the 'Action' game. As can be seen, the villagers has gotten nametags over their heads, which has been labeled as the main character sees them
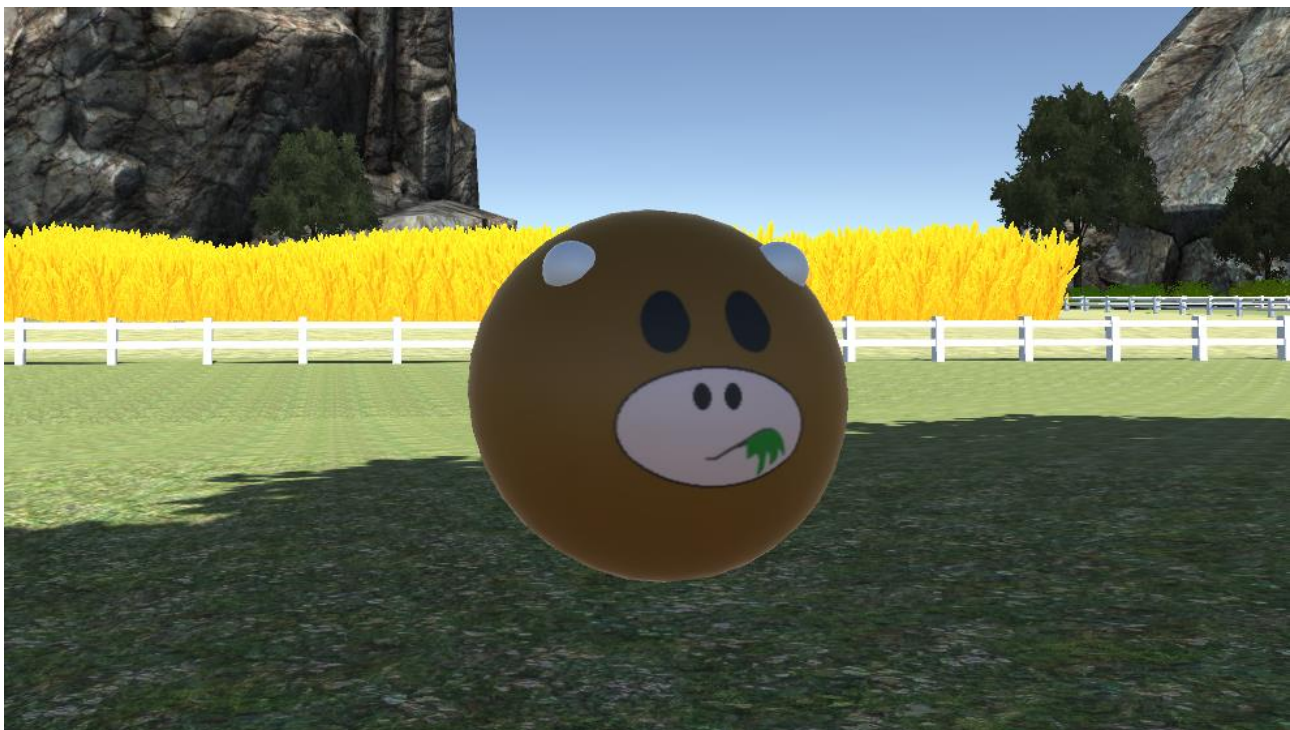
Figur 80 A cow in the game. Maybe this is Bob's favorite cow?

For the feature of building the slingshot, a marker was added on the ground (see Figur 81) which should help players in this task. For the building of the slingshot (see Figur 82), it is simply required

that the player has already talked to Bob, the carpenter, the mayor and the librarian (wizard) and thereafter moves to the marked spot. A fade in and out mechanism (essentially just a black box changing transparency levels to fully visible and back to invisible again) was added to cover for the fact that nothing happens when building it. In using the slingshot it was hardcoded how high and how far the main character would fly after firing the slingshot (see Figur 83) as to have more control over this aspect.
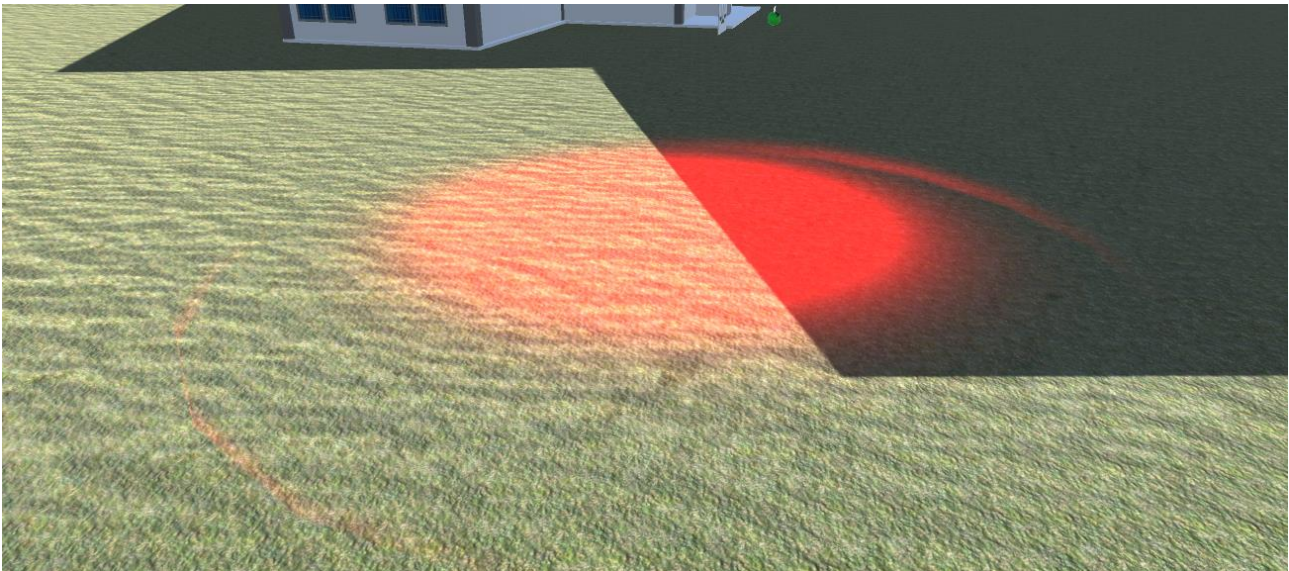
Figur 81 The marker shown to the player as to make it easier to locate the building spot. The town hall can be seen in the background
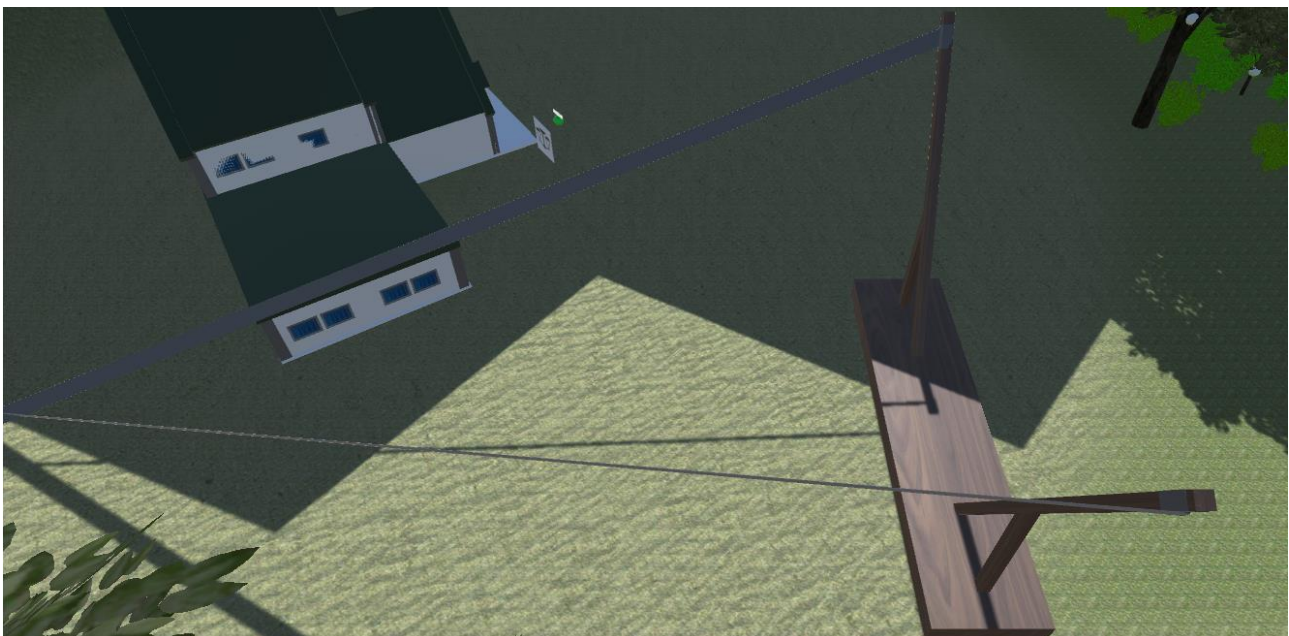
Figur 82 The slingshot as it will look when fully built. The main character will be put into the rubber band before they are shown, which made it easier to just create two flat boxes that would pretend to be rubber bands

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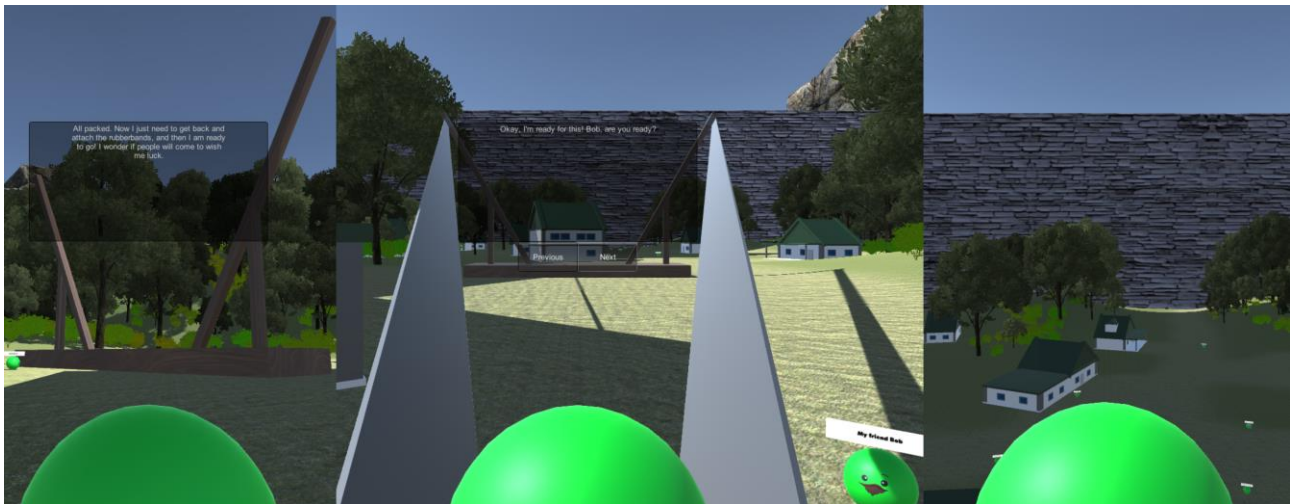
Figur 83 In these screen captions it can be seen that when the slingshot is built initially (left) it does not have any rubber bands. In the middle, the main character is strapped up in the slingshot and on the right image he is fired off towards the wall

When entering the desert, the main character will be locked in position and be placed closed to the initial cave he is supposed to discover (see Figur 84), and to hide the fact that he can only walk forward at this point, the whole screen is black. When being in the cursed land, except for the caves and secret passage, the feature of fog is turned on. The level of the fog is coded to be diminished upon the character picking up the goggles. In order to pick up items, I have chosen to implement, that the character should just collide with them.
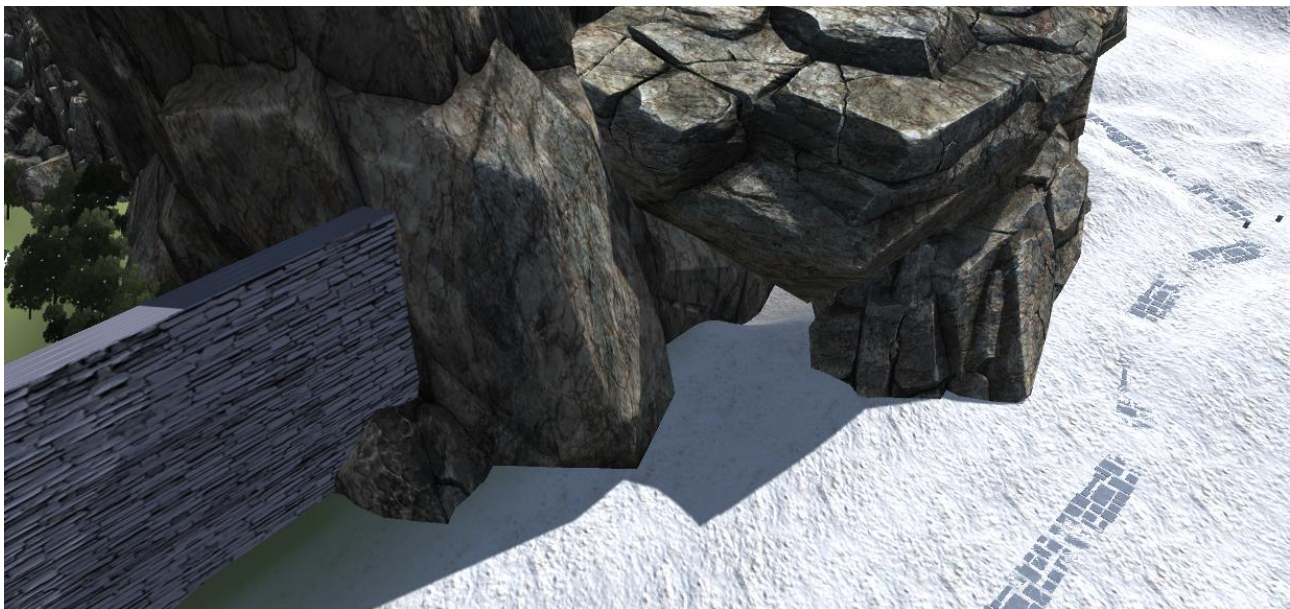
Figur 84 This is an image of the opening to the first cave, which the players are forced to visit upon reaching the cursed land

In order to show the players that they have collected something readable, they are instructed by a GUI box to press 'I', as seen on Figur 85, where after they can select what to view as seen on Figur 86.

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The notes and other items which can be picked up, have been given a small particle effect (as seen on Figur 87), as to make them easier to spot for players.

Figur 85 In this picture, the main character has just picked up something viewable, and the hint for reading it
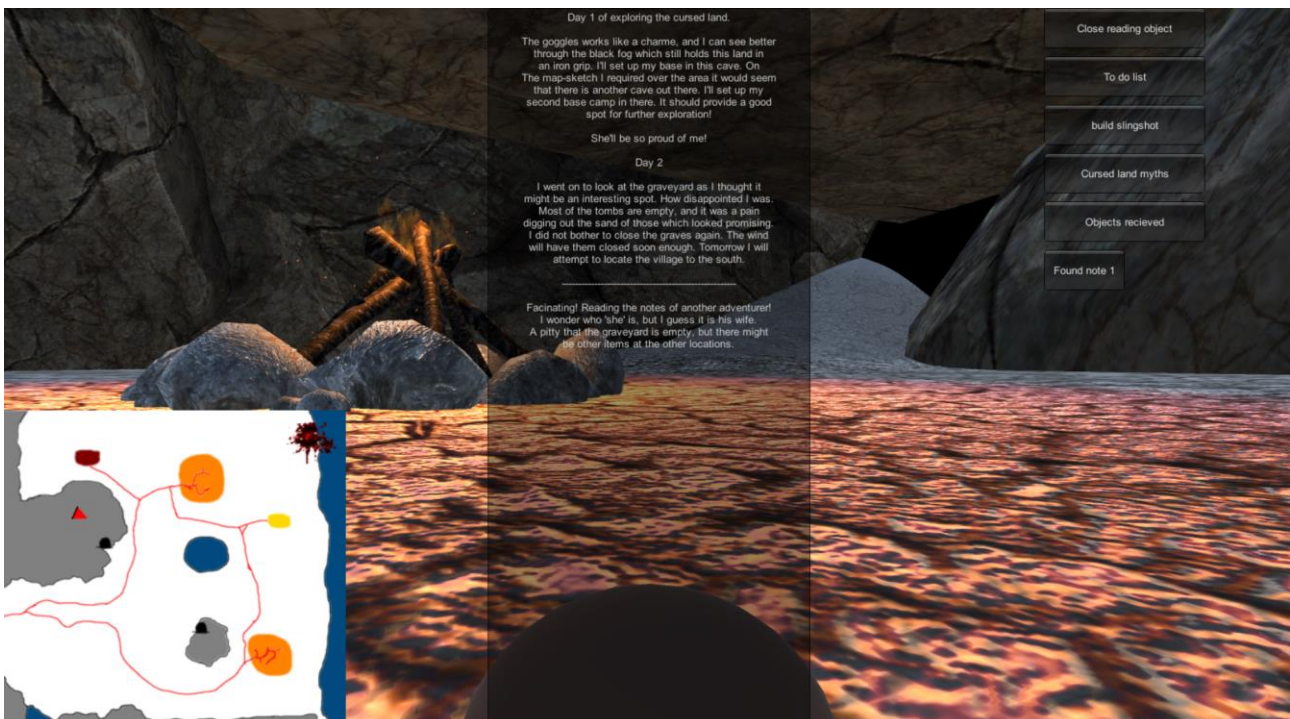
Figur 86 This is how it looks when a player presses 'I', which allows them to read picked up notes, and locate themselves on the bloodstained map

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Figur 87 In the first cave the main character will comment on the three items on the floor which can be picked up. The items has light blue particles coming out of them, as all other notes will also have. The objects to pick up here is the goggles, the hand-map and the first note in the game

The monster created for the game can be seen in Figur 88, where it needs to be mentioned that its teeth rotate independently of each other. Skulls have been place inside its mouth as to indicate that it keeps what it devours, and this makes it grow.
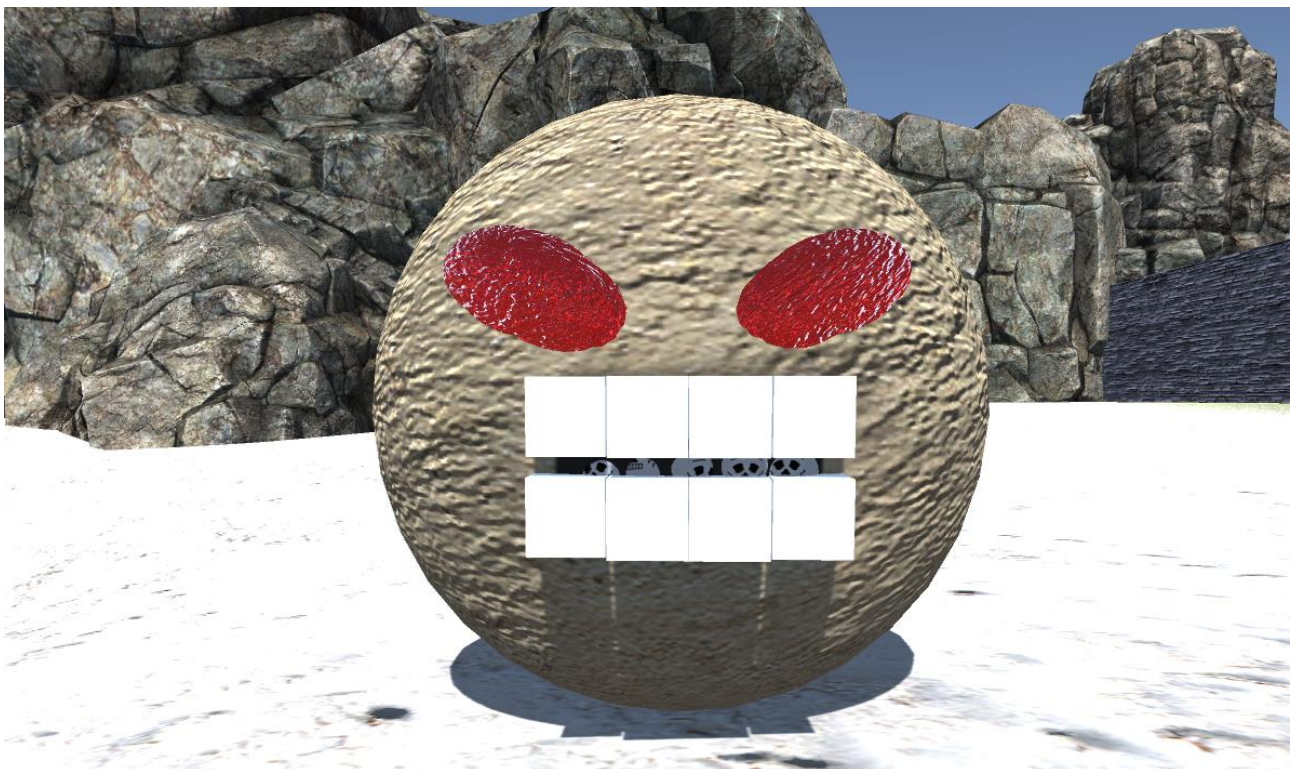
Figur 88 This screen caption was taken from the editor in UNITY, hence this is how the monster looks when inactive. The eight teeth will rotate independently when active, and the skulls can be seen in its mouth

The move pattern of the monster consisted of some six spawn locations, where it would reside for a bit before being placed at the next point. As such it was attempted for it to locate the player. The detection radius was set to 35, and its movement was 6.5 as opposed to the players' normal speed of 5 and a speed of 8 when sprinting. As such it should not be hard for players to avoid the monster, as long as they see it coming. On the rest of the figures below, different locations can be seen as to show how the rest of the environment ended up looking.

Figur 89 These four images shows the library (top left), the town hall (top right), a view of the regular houses (bottom left) and how the secret passage was well hidden (marked by a red square in the bottom right corner)

Figur 90 This is the second cave that can be located in the cursed land. As can be seen, there is a fireplace going as to indicate that it is a campsite
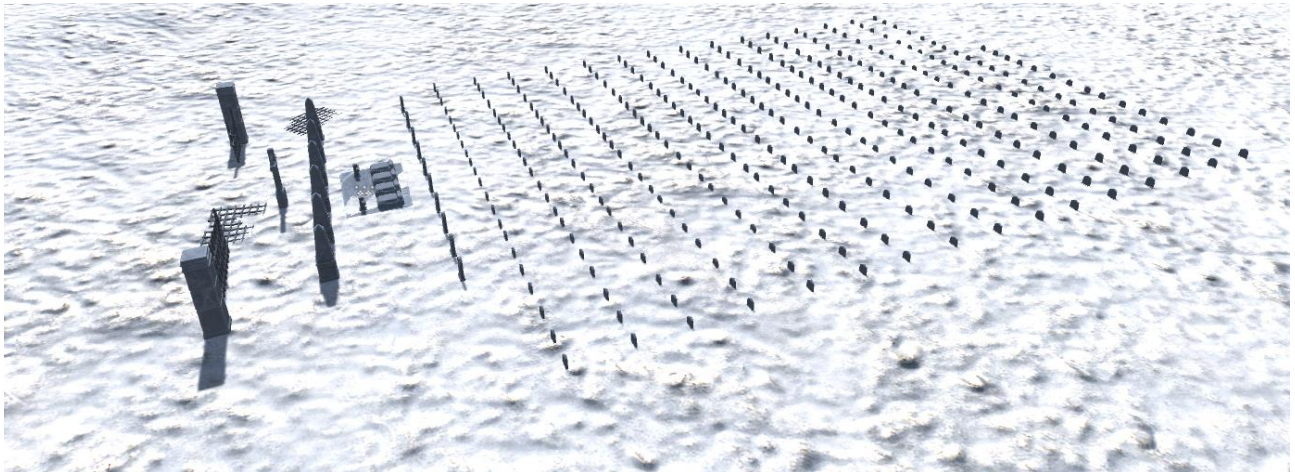
Figur 91 Grave yard
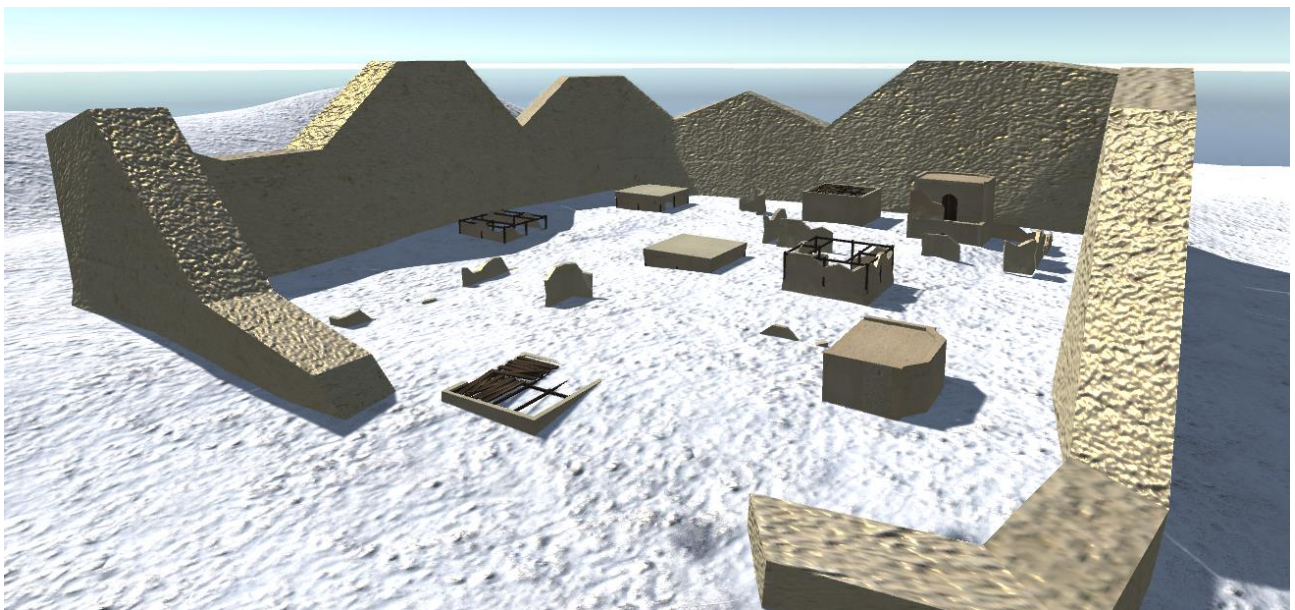
Figur 92 One of the village ruins in the cursed land
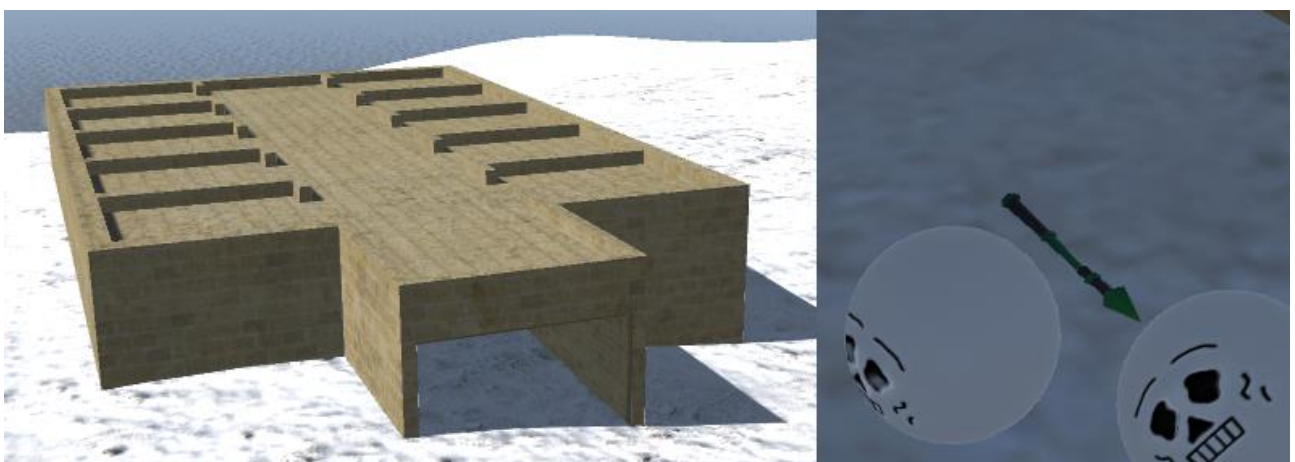
Figur 93 The prison as it looks from the outside, and the lost scepter, which is located in one of the prison cells

Figur 94 The prison cell with the eggs inside of it
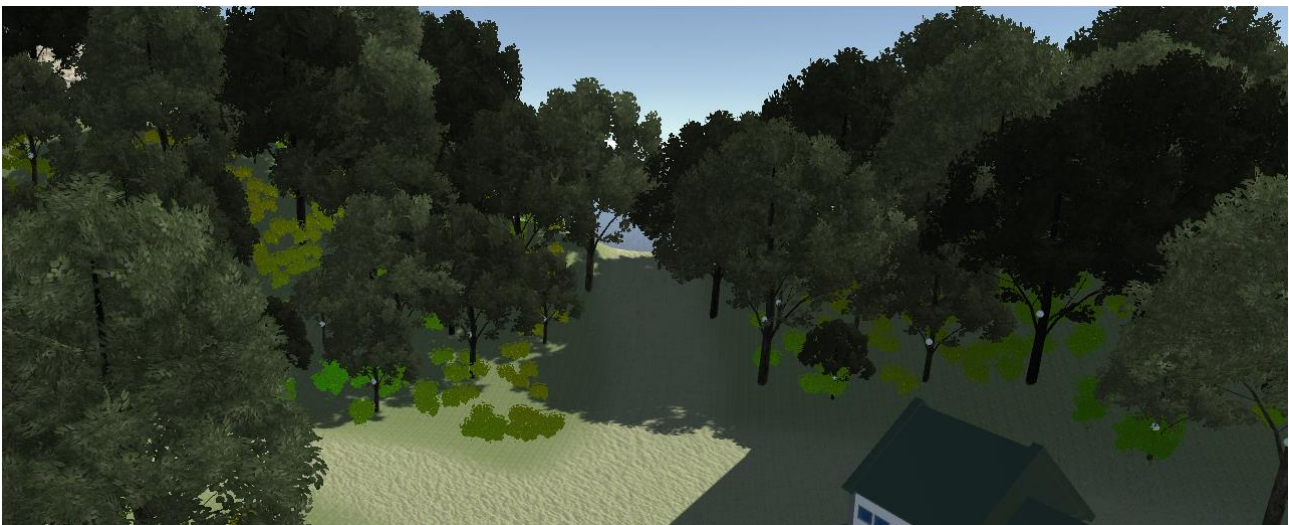
Figur 95 for aesthetic purposes it was made to appear as if there was a world outside the village, as a road leads away from it. However, if a player tries to use this, the character will collide with an invisible object, where after the character will state that he does not want to go this way, and then turns around and walks a bit back from the invisible object. The same walking back mechanism has been put in anywhere a player can walk of the map, where there are no cliffs as a natural obstacle.

Upon reaching one of the two good endings where the main character survives and can go back to his village, after talking to bob, the Carpenter and the Mayor, the players are presented with a congratulation statement telling them that they completed the game.

5.2.5.3 Adding the statements and questionnaires

I have chosen to present the participants with five questionnaires while playing this game. The reason for this is that when the first is presented, it is at the story stage that can be referred to as the 'point of no return', where the main character is about to hurl himself over the wall. The second questionnaire is presented when the player has picked up the final note, which prompts him to want to destroy the eggs, and then the third is activated when the eggs are destroyed. The fourth is activated when the main character discovers that it was the librarian who is the wizard, and not the new mayor. Upon choosing what should happen when presented with the multiple endings. As such the questionnaires can be stated as being added to places in the game where key elements in the story are relayed to the player. It could be stated that there should rather have been a time limit in relation to when the questionnaires should be featured, which was also my original argument for story heavy games. However, in the creation of this it became clear that players could wander off for quite some time with nothing happening, and as such, I found it more suitable to implement the questionnaires as described. Hence I will argue for future reference, that this type of condition (reaching a key point in the story) should be added to the framework's presented conditions.

As for the statements in relation to why a participant rated their CoDe as they did, the following statements were formulated in coherency with the CoDe elements:

I want to solve the game's challenges
I do not like the challenges provided in this game
I want to explore the game's environment
There is not enough to explore
I find the story compelling and well told
I hate the story it should be different
I am curious to see how the story will develop
The story is boring
I like the way the story is revealed
The game would be better without the story-element
I would like to see more to the characters
I find the characters boring
The characters amuses me
I want to kill all/some of the characters
I want to complete/ win this game
The game does not give me the desire to complete/win it

As of such, we move on to the last game, the 'Creativity' game.

5.2.6 The 'Creativity' game (Simulation explorer)

5.2.6.1 Designing the game

5.2.6.1.1 The Gamer Motivation Model aspect

The primary player type of 'Creativity' holds the two subtypes of 'Discovery' and 'Design'. The preferences for these types are the following: wanting to experiment with a game's world, they often play games as not intended by the developers, expressing individuality in the game, puts a lot of work into character customization (if this is possible), takes time to design how things should look if they are given the opportunity to build in games.

As such I have chosen for this game to feature the opportunity of building, exploration (in terms of discovering new items) and to allow players to experiment where the game will 'reward' them in regards to paying attention to that the player has tried to experiment. I have chosen to not feature character customization due to the time limitations of this project.

5.2.6.1.2 The Self-Determination Theory aspect

For this player type the element of 'Autonomy' can be argued as the most important of the CAR elements. This is due to them having the need of experimenting, crafting and customizing. Hence any restraints put on the 'Autonomy' of a player in this game needs to have a substantial reason for doing so. The 'Competence' and 'Relatedness' aspects does not seem to resonate much with this player type, and as such I will regard it as more important to feature game controls which can allow for experimenting and crafting, than limit the controls in order to make them easier to master. For the psychological need component of 'Relatedness' I will regard it in the line with the player type's described aspect of expressing individuality in a game, and as such the already chosen feature of being able to build in the game should correspond to this need.

5.2.6.1.3 The Continuation Desire aspect

For this game I have chosen to mainly focus on the 'Activities' of 'Experimentation' and 'Creation' as the primary elements, and the element of 'Exploration' as the secondary element. The 'Exploration' element for this game will be linked with the 'Experimentation' element, where exploration of the games world will render players more building features to experiment with. Furthermore the exploration of the game's world should lead to players coming up with ideas for how to experiment in it. The 'Activity' of 'Creation' is closely linked to the need for customization for the player type, and as such is used in relation to the already chosen feature of allowing the players to build in the game.

5.2.6.1.4 The design choices

As the above have been established, the game design can hereby be created. As already stated in the previous text, players in this game will be given the ability to build objects. In order to keep track of what can be build, I have chosen to implement a building menu in which the different objects, that have already been unlocked as to allow for building, can be seen. In order to select which object to build, a player will simply be required to click on a picture with the mouse curser, to select the object. After this they can close down the building menu and start building the selected object. As to

help the player in figuring out where the object will be build, I have chosen that when pressing and holding the right (as in left/right, not correct) mouse button, as marker will appear on the ground in relation to where the mouse position is at. After moving the marker around by simply moving the mouse and continuously holding down the right mouse button, the player will need to activate the building function by pressing a keyboard button. Since the player type this game is targeted likes customization, I have chosen that players should be able to manipulate built objects to a certain extend. This means that they will be allowed to rotate the objects around the y-axis, move the object to the sides and up and down, and be able to scale the objects up and down on all three axes. The players will furthermore be able to delete built objects. As the player will need to have a chance with how to use the building feature of this game, the game will start with a tutorial, rendering the player three objects that can be built. I have chosen that these objects should be cows (as seen in the other games), wheat and fences.

I have chosen to create a game environment map in which it is only a part of it that a player is allowed to build. This was done from the perspective that the players should be given the challenge of exploring the environment as to find objects with which they can build. Naturally this creates a restraint on the 'Autonomy' felt by a player, but my choice for this was also made in the relation to experimentation, and playing the game as it was not meant to be played, which is a part of this player type.

The only building object that is allowed to leave the building area is the cows. These will not be stopped should they roam outside the building area and they will be given the ability to swim as to not be trapped under water. As a further choice for the cows they will be attracted to wheat, where they will attempt to eat it if it has been placed on the ground, and if there is no wheat on the ground, but the player has currently selected wheat as a building object, they will move towards the player. If cows are allowed to eat wheat, they will grow in size. I have chosen that players should not be able to delete cows, but also put a limit of a maximum of 10 cows which can be built in the game.

In regards to elaborate further on the choice of only have a specific area in which the players can build, I have chosen that it should appear that the players are only allowed to explore a certain amount of the map, and is not allowed to do things such as jump down in rivers just to see what happens. As such I have designed for ways in which the players are actually able to 'break' the gameplay, for which they will scolded by the game. It may seem as a penalty to be "scolded" by the game, but I have chosen to create this action as to have some feedback for the players telling them that they should in fact experiment as to discover new parts of the game.

In order to design for the situations of 'breaking' the game I have chosen that the environment will be constructed in the way as depicted on (ref to picture).

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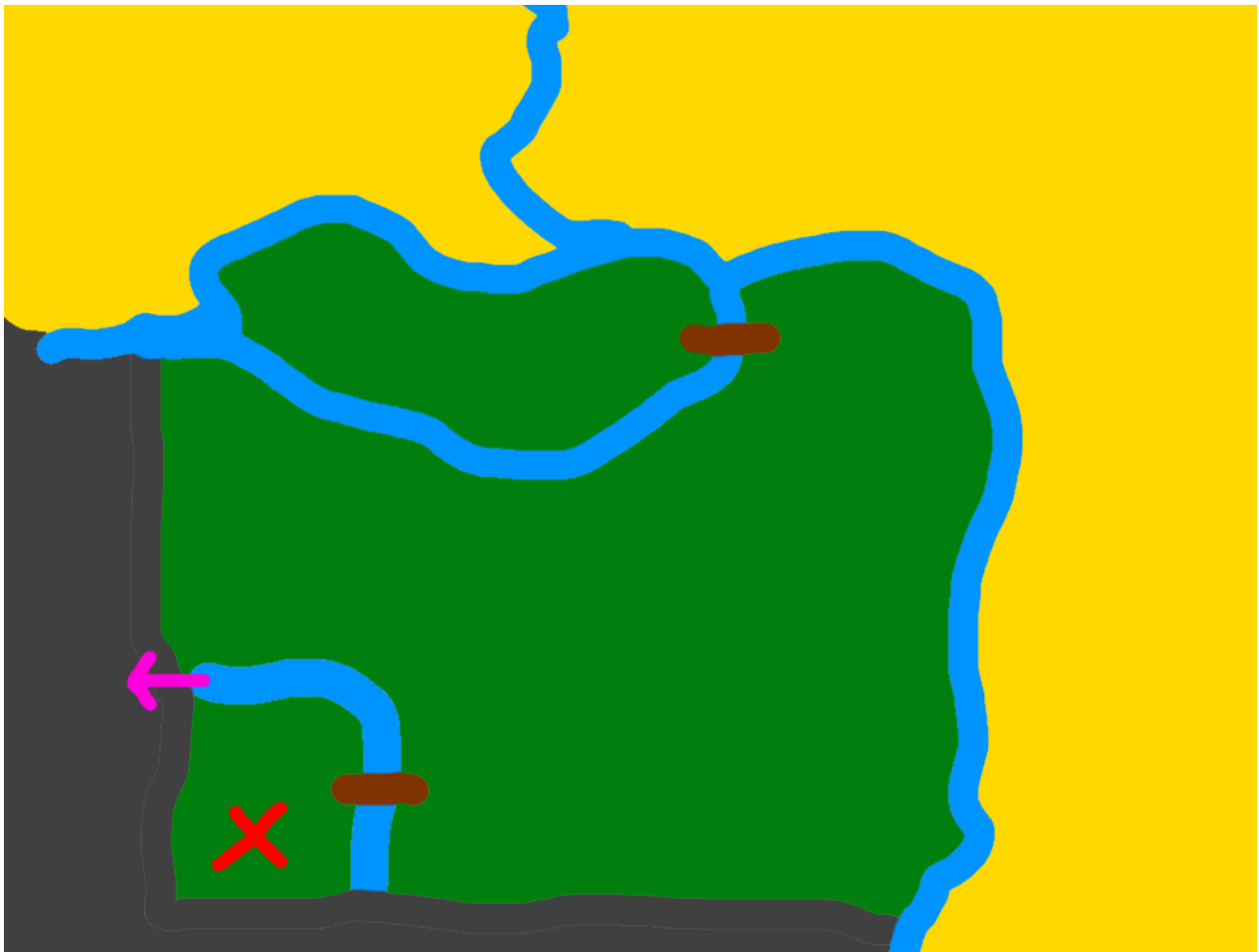
The player will start at a bare piece of land (marked with the red X), which is surrounded by high cliffs (grey areas), and bounded by water where there are no cliffs (the blue lines). The green areas on the map is where the player is "allowed" to roam, with bridges (the brown lines) securing passage between these areas. The yellow are is a desert in which the players are not allowed to enter by default.

I have chosen to design three different ways in which the game can be 'broken' by the players. The first way is for player to build their way upwards, as in an attempt to reach the top of the cliffs. The second is to try and reach inside what will appear to be a cave opening (the pink arrow). This can be done by building objects reaching out of the area with the cross on, and run towards the opening in the cliffs. As already stated players will not be allowed to go below the water surface (they will simply be put back into the area with the cross on it), but if the players examine the cave opening which will clearly show that there is an opening all the way to the other side, this should hopefully prompt them to try and defy the water.

The third way is a bit more sophisticated as in terms of experimentation. For this the players need to use the cows that can be built in the game, and lure them to the edge of the river that separates the

green areas from the desert. The player is then able to push the cows into the water, and stand on them while holding wheat, in order to make them move. It will require patience and most likely several tries, but in the end it is durable to use the cows as a living raft carrying the player over to the desert land. In order to make this easier, i have chosen to make the players' character a sphere.

When players break the game, they will receive a message about this, and as penalty, they will be placed in a dungeon, in which they need to find three chests in order to come back again. It will not be stated that they need to find three chests; the players simply need to explore the dungeon on their own.

For the objects to collect in this game, I have chosen the easiest solution, as to implement objects which was already featured as prefabs in relation to what had been downloaded for the other games, except for a few different items added for aesthetic value, such as more plants than what is normally featured as the basic package.

5.2.6.2 Implementing the game

When implementing the game, the environment followed the previously featured map with very few alterations as can be seen on Figur 96.

Figur 96 The environment created for the game, where high cliffs and water limiting the players' movement

The building marker came to be by using adjusted particle effects, such as to create an X with them, which can be seen on Figur 97. When building an object, the right mouse button had to be hold down while the players' character is on the construction island, in order to bring up the marker, and since I implemented the marker to appear where the mouse is located at using raycast, I furthermore

implemented that activating the right mouse button would automatically move the cursor in the middle of the screen. Upon bringing forth the marker, pressing 'C' will create the selected object.
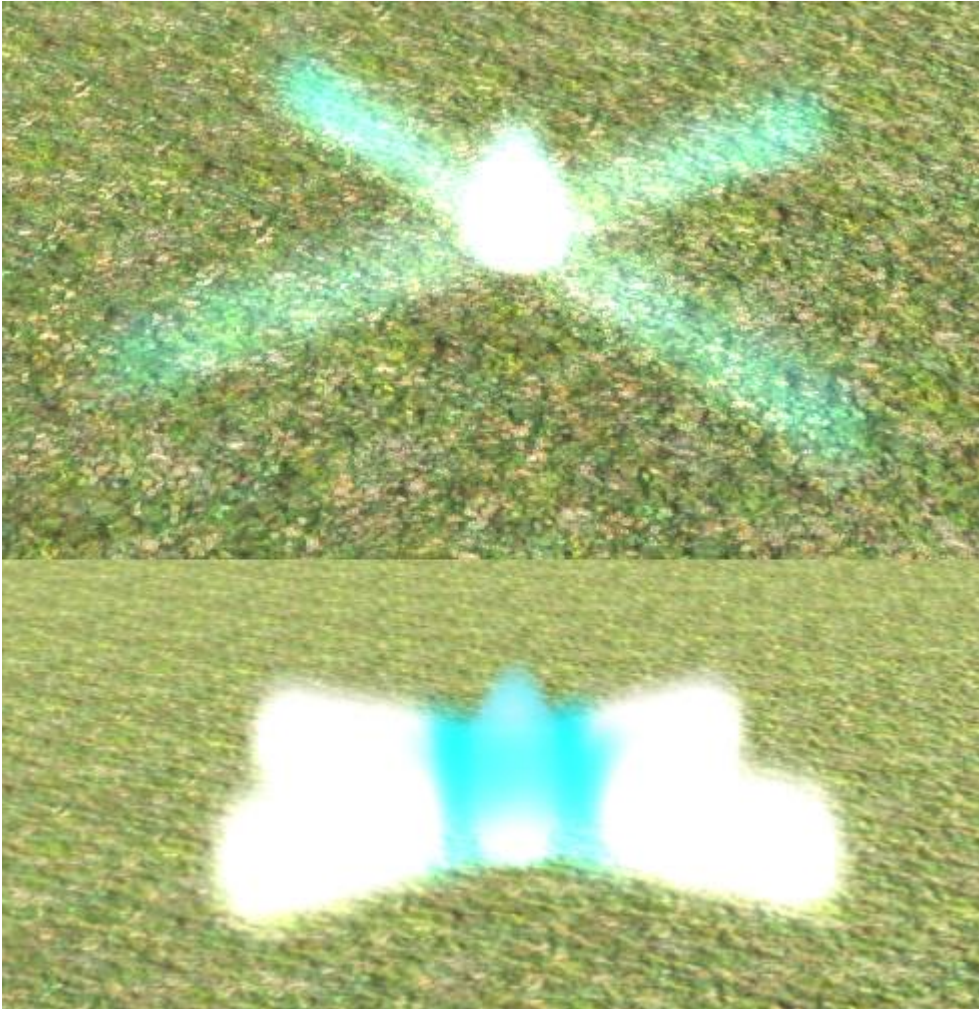
Figur 97 The building marker, as seen how it looked in the editor, versus the played game from the character's perspective

If a cow has been built and there is wheat on the ground, it will stop whatever it is doing, and go for the wheat. Upon reaching the wheat and colliding with it, the cow will grow in size. If a player has selected wheat and no wheat is on the ground, the cow will move after the player.

A tutorial level was created for this game. In this the player is trapped on the building island by two large surrounding white walls (see Figur 96). A character presenting himself as Steve, tells the player that they have taken the role of a convict who has been put into an artificial coma as punishment. As such the prisoner has no rights, and can be used for experiments as pleased by higher powers. Hence the prisoner is now explained as being brought into the game environment as part of some experiment. Steve takes the player through the basics of finding chests and building objects and manipulates them. As this is pretty information heavy, hints have been provided, whenever a player selects an already built item (see Figur 98). Cows cannot be selected however, and once unleashed,

there is nothing more the player can do about them, except to feed them and lure them with wheat. In order for cows to 'swim' a quad was place just under the water surface for the rivers, and this collider keeps the cows above and 'swimming'. As a clue in relation to selected built objects, a blue light (see Figur 98) was added, and attaches itself to selected objects. If there is no selected objects, the light will place itself in 0,0,0 position in the world.
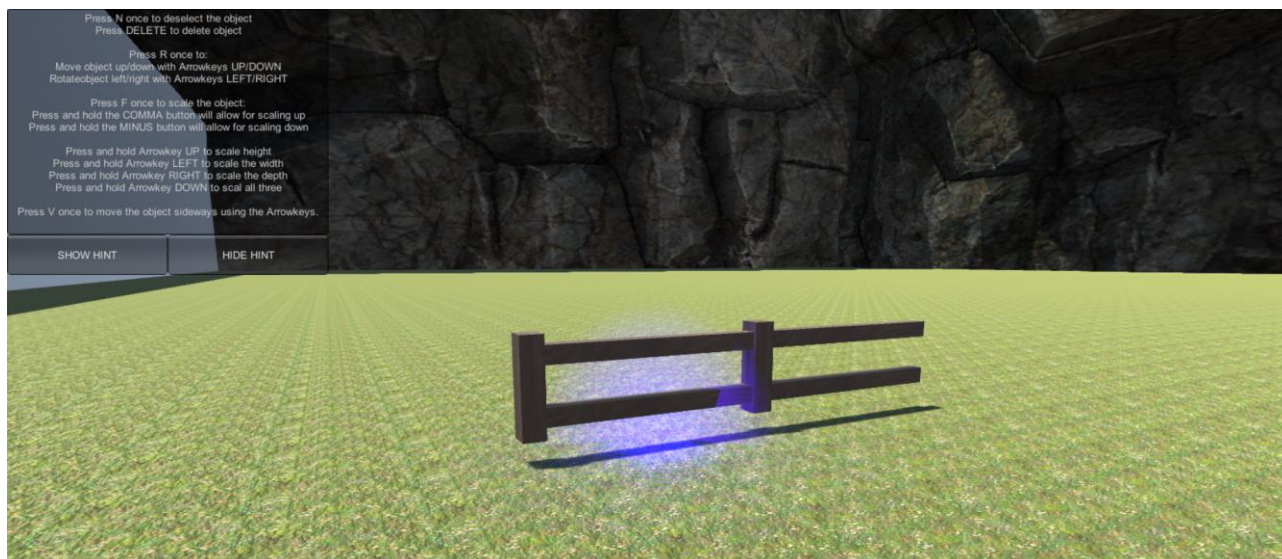
Figur 98 In this image it can be seen how the selected built fence has a blue light component attached to it. In the upper left corner, the hints for how to manipulate objects can be seen

The objects players can find and collect was also given a visual clue of a high particle line (see Figur 99), as to make them easier to spot. Items which can be found this way includes chests, plants and a few other objects. When collecting chests, the players unlock specific items, as to which chest they collect. In order to make this simple code wise, the chests' names were constructed to include the numbers for the items that could be activated. E.g. if a chest had the number _100_ in it, item number 100, which could e.g. be a door, would be featured in the building menu.

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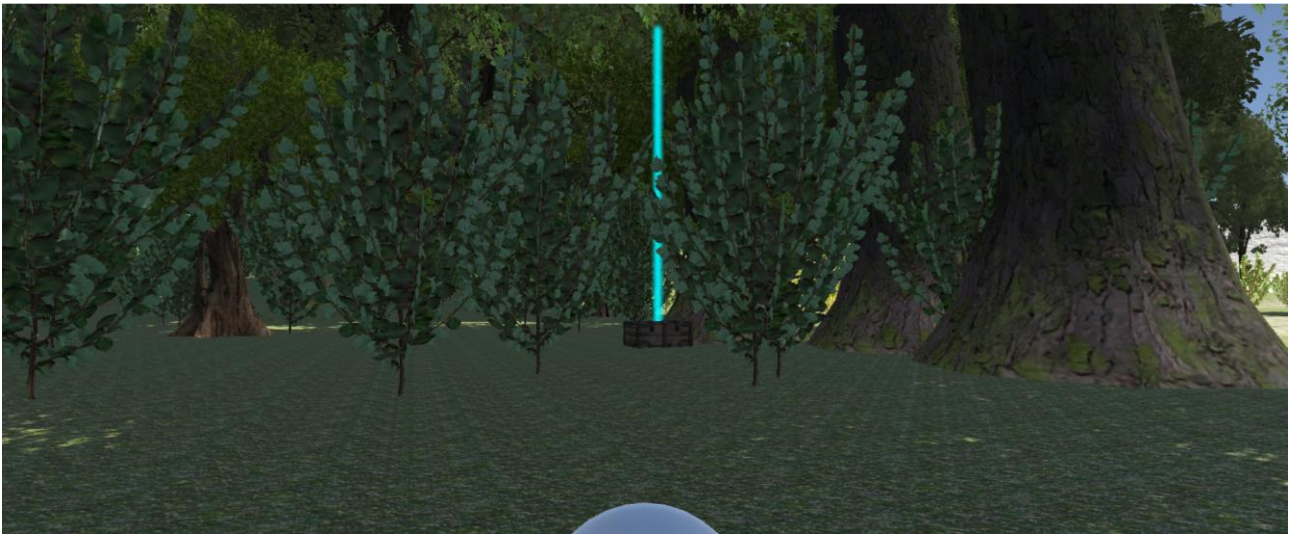
Figur 99 The collectable objects were given a blue light as to be easier to spot for the players. The items that can be collected on the game was responsible for how the road came to look, as it was attempted to have them close to the roads

The building menu was constructed as can be seen on Figur 100. It was made with UI buttons, where the appropriate code would check the buttons name (which are a number), and thereby correlate it with a list holding the prefabs. I.e. if a button had the name 3, this would be correlated to place number 3 in the list with prefabs. As of the amount of objects that could be discovered and build, the building menu had to feature several pages, which could be switched between by using the UI buttons that can also be seen on the building menu picture.
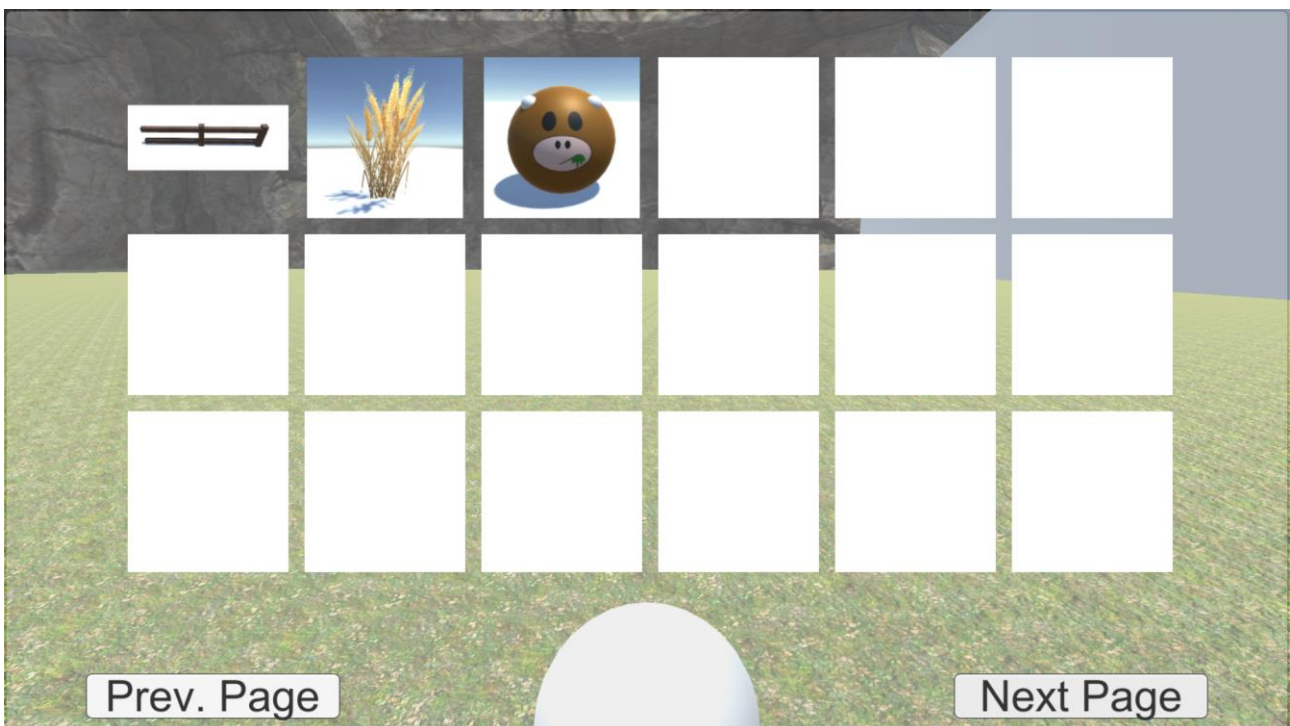
Figur 100 This is page two of the building menu, where the buttons for selecting fences, wheat and cows can be seen as activated

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The dungeon created for this game became more of a labyrinth than an actual dungeon (see Figur 101). As such I created it in such a way, that if the player keeps to the right side of the wall (including when reaching dead ends), the entire labyrinth can be solved as to finding the objects. I implemented the labyrinth as a three part feature, as players are supposed to be thrown down there three times for breaking the game. As such I evolved the story element, where the Steve character refers to the labyrinth as unfinished the first time, still unfinished but larger the second time, and finished when referring to it the third time. When the players are put into the labyrinth the first time, it is only the first section which they can roam, while the rest of the labyrinth is invisible. Hence, the hallways leading to the other parts are sealed off with transparent red boxes (see Figur 101), such that the players can view the bleak land in which the labyrinth is built upon. When other parts emerge, the red boxes disappear, but a wood board floor indicates where the red boxes stood before (see Figur 101).
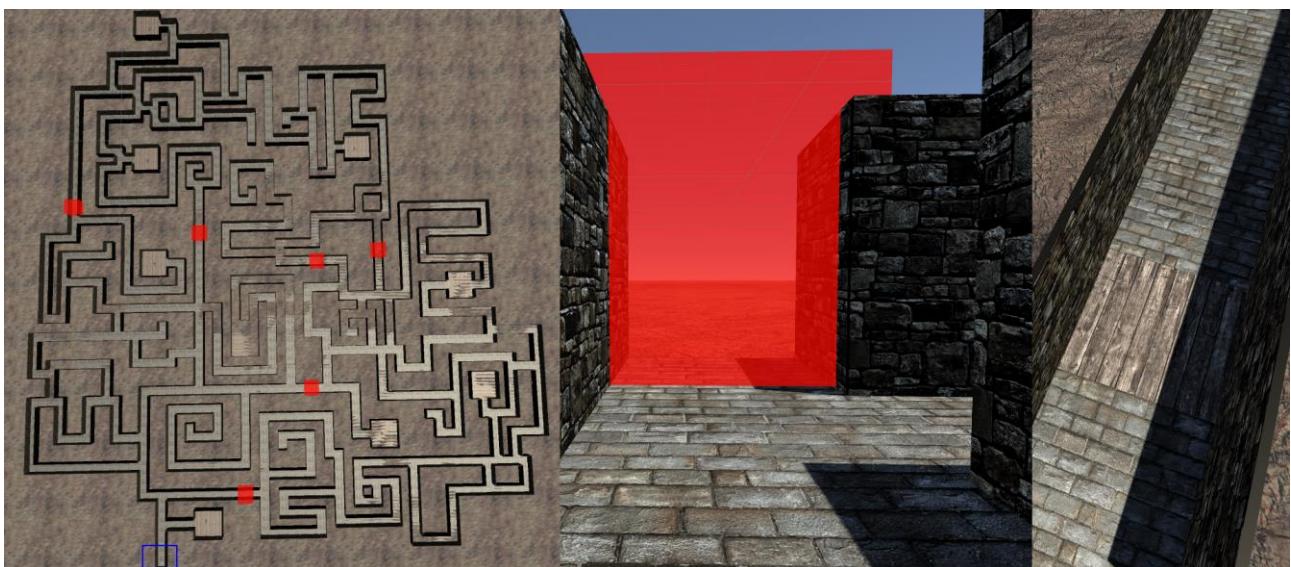
Figur 101 Screen captions of the labyrinth. The left image is the entire labyrinth, where the blue box indicates where the players will spawn upon entering it. The middle image is the red transparent boxes that are used to seal of the players in the labyrinth. The right picture is the wooden floor placed where the red boxes was, when another part of the labyrinth is activated

If a player manages to break the game all three times and come back to the world from the labyrinth, the end of the game is a dialogue in which Steve has figured out that he is the test subject, and that he does not even know whether the prisoner is even a real person or not. Steve is quickly interrupted, and the players are told to proceed as normal, and that they will be contacted again in ten years. When the player moves around in the environment, the trees and bushes make it hard to orient one. As such not only was a mini-map implemented (as seen on Figur 102 where the player is the red dot), but dirt roads were created in such a way that they would pass close to collectible objects (see Figur 102). The following figures will show the above mentioned, along with how the building menu pages will look, when all the collectibles has been unlocked.

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Figur 102 The screen caption on the left shows environment without terrain-trees active , and the featured road can be clearly seen. On the right side is a screen capture of the mini-map as it looked in the game
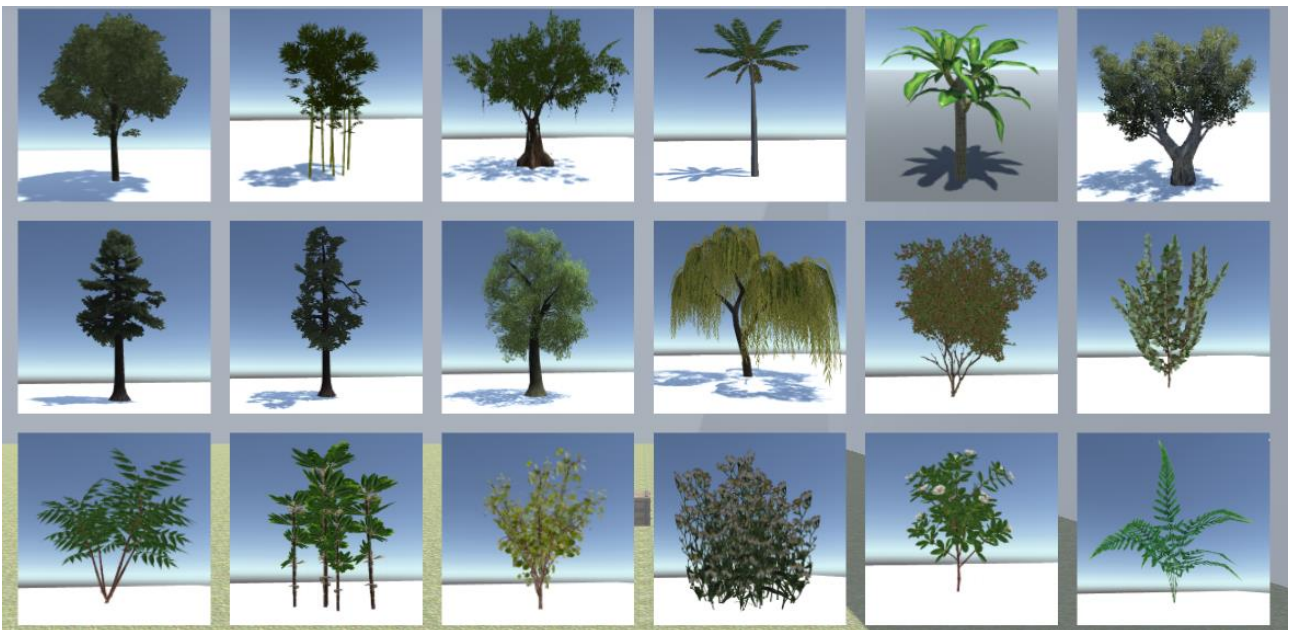
Figur 103 First page of the building menu with every item unlocked
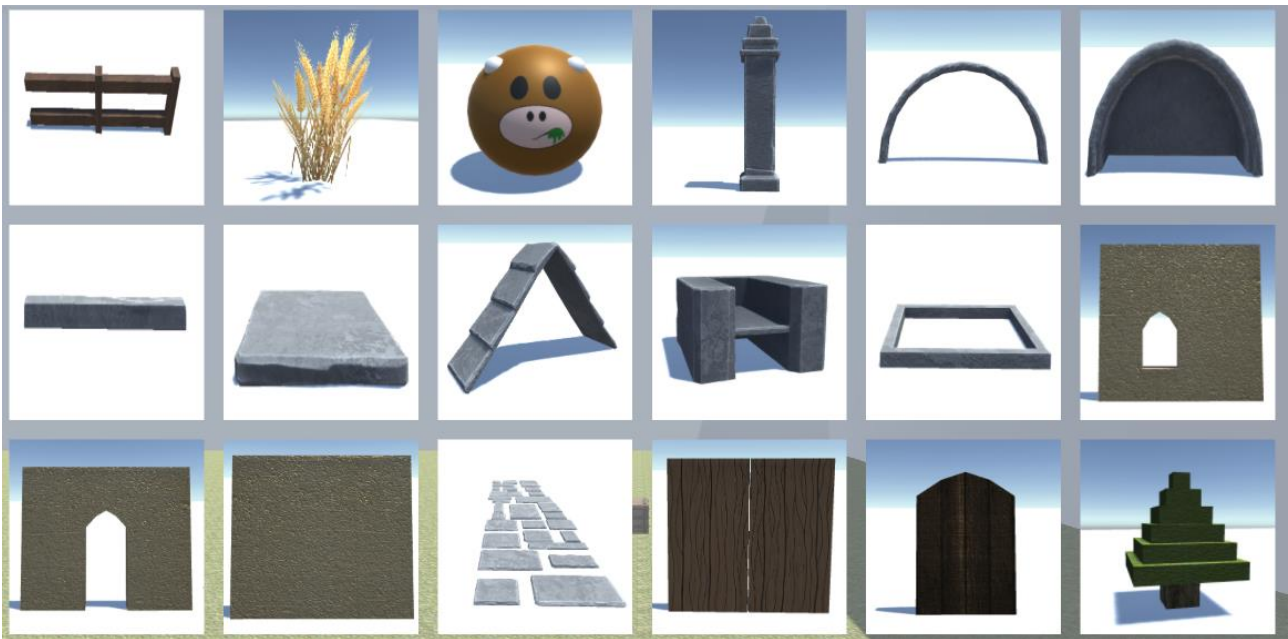
Figur 104 Second fully unlocked building page

Figur 105 The third page of the building menu showing the unlocked building objects
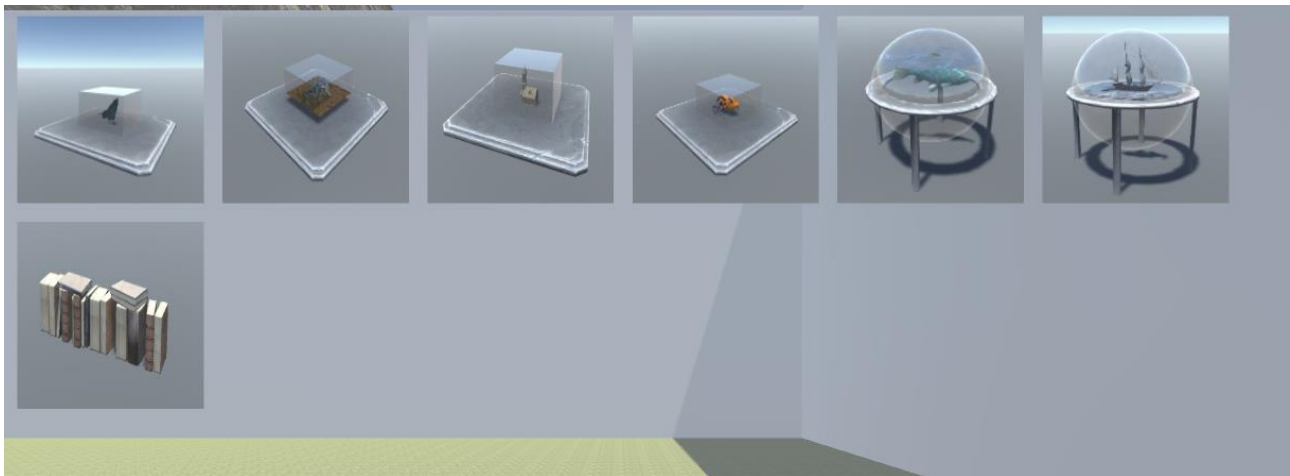
Figur 106 The last page of the building menu, which contains more decorative indoors objects, but does not have as many buttons as the other pages

As can be seen from the building menu panels, there is quite a few objects with which players can get creative, even though all the objects beyond tropical plants was taken from the assets already downloaded, which should hopefully satisfy this player type.

5.2.6.3 Adding the statements and questionnaires

For this game I added four questionnaires. As the game featured a 'clean' tutorial level, the first RQ2 was presented upon completing the tutorial. The next RQ2 is activated when participants finds their first chest outside the tutorial level. For the third RQ2, this is presented when a participant breaks the game and is sent to the labyrinth the first time. The LQ3 is presented when a participant completes the second part of the labyrinth. As i regard it as very time consuming, in relation to the third way to break the game, I did not include a questionnaire here, and as a second reason, when completing the second part of the labyrinth, the participants are expected to have experienced enough of the game content as in order to be presented with the LQ3.

As for the statements in relation to why a participant rated their CoDe as they did, the following statements were formulated in coherency with the CoDe elements:

I want to solve the game's challenges
I do not like the challenges provided in this game
I want to explore the game's environment
There is not enough to explore
I find the story compelling and well told
I hate the story it should be different
I am curious to see how the story will develop
The story is boring
I like the way the story is revealed
The game would be better without the story-element
I would like to see more to the characters

I find the characters boring
The characters amuses me
I want to kill all/some of the characters
I want to complete/ win this game
The game does not give me the desire to complete/win it

As such the design and implementation of the questionnaires and the game was created. Hence the product was put up online for testing. As incitement, a draw for 500kr was added for those who completed the test. The next chapter will evaluate the test and present the results gathered.

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6 Evaluation

In this chapter I will first evaluate the test execution and present what went wrong and alterations that was made for the testing procedure. I will then present some bugs and glitches that emerged in the built game which was unaccounted for at the time of the build along with some missing content that slipped past my attention in either the design process or the implementation process. Hereafter I will present the results from the test. It has to be noted that since only four people completed the test it does not make much sense to try and interpret the data in a quantitative manner as I had originally intended. I will therefore use a qualitative perspective when using the results instead.

As there is data for each of the six different games and since that it features a rather substantial amount of data, I will discuss each game's data results in the subsections where the results are presented. In other words, I will construct six different subsections in this chapter, one for each game, under which a game's data is featured, and after presenting the data in a subsection, I will discuss these data and how they can help in improving the games, which is what the questionnaires created for this project are intended for. Any other discussion aspects in relation to improvement of the test method, how effective it was, its weaknesses and any other aspect that needs to be discussed will however be featured in the 'Discussion' chapter.

6.1 The testing

When putting my product up online for test I had hoped for at least 25 responses to be sent back. However, as only one person returned a response before the time limit for the testing period had run out, it became necessary to try and gather responses in another way in an attempt to have more than just one dataset for the results. As such I conducted three more tests where I was present in order to ensure that the tests would run as smoothly as possible. Below I will evaluate the individual test executions.

6.1.1 Participant 1

The first participant downloaded the game from the internet and played it at home when she had time to execute the test, as was originally intended for every participant. However, the participant ran into trouble and had to get in touch with me, where after I guided her over the online messenger program 'Skype', in order to have her complete the test. The test had to be split up in two days as the participant had begun the test late in the day and as such grew too tired to complete the entire test in one go.

A further obstacle for this test was that the participant was not adequately paying attention towards the written descriptions featured within the games, which was meant to help the participants. This lead to misunderstandings and a lack of use of certain features in the games that would have made it easier for her to complete the games. As an example of this, there were mini-maps present in four out of the six games, but she missed this information in one of the games making it harder for her to figure out where to go next. Another example, which firstly emerged after viewing the results from

the responses, was that in the 'Mastery' game (Defend your castle) she apparently did not know why the enemy had more soldiers than her despite all of her barracks (5.2.3.2 Implementing the game). This most likely means that she was unaware of the fact that soldiers stop spawning if there is not enough food or water available, and that the amount of food and water produced can be seen on the screen while playing. If she had paid attention to this detail which was described in the beginning of the game (and subsequently could be brought forth again at any moment Figur 58), she would have known why she did not have many soldiers in the field.

Especially two games provided a challenge for this participant to get through; the Action game (Mercenary) and the Achievement game (submarine adventurer). The Action game was perceived by the participant to be unplayable as she had not discovered the feature of sprint in this game, which would have helped her survive in the game. As of this I instructed her to use the sprint to reach the cities which would provide her with the questionnaires. As such she did not experience much of the game and its features as she just wanted the game to be over with and done. The Achievement game had another problem for the participant though. This participant is not happy about horror games to put it lightly, and in this game she perceived the giant fish (Figur 70) attacking her as a horror element. Hence she had to reset this game in order to complete it, as she had burst the bubble with the fish in before completing all of the RQ2s feature in that game (5.2.4.3 Adding the statements and questionnaires). A further thing which disrupted her second time playing through of the Achievement game was that she only upgraded the speed boost (5.2.4.1.4 The design choices), which meant that she could not battle the fish, which was needed in order to activate the LQ3 for that game. This ended with me shipping of a notepad with the LQ3 questions in it which she then filled out separately, such that she did not had to encounter the fish again.

Of other notable mentions the participant furthermore encountered bugs in the 'Immersion' game (The cursed land). During the event where the played character uses a slingshot to get over the wall (Figur 83) an unknown bug made the character fly face first into and through the wall instead of over it. This displaced the character in such a way that the trip to the first cave (Figur 84) was longer than it should have been. Upon reaching the cave, the character fell through the environment, which had the consequence that the participant had to reload the game. Fortunately she had saved the game earlier, which meant that she did not have to run through the game from the beginning. On the second try, where the RQ2 at the slingshot was not present, as it had already been filled out, the character did make it over the wall. Another bug featured in this game was that when the participant wanted to try out other endings, the wizard did not appear in the cave (5.2.5.1.4 The design choices) which had the monster bugging out as it tried to hunt him and get stuck in the cave.

When reaching the final game, the 'Creativity' game (Simulation explorer) the participant did not have patience to try and complete it on her own as the game features the exploration aspect and the player needs to come up with ways to oppose the game (i.e. the thought process of thinking "what if I did this..."). Hence I gave her a screenshot of the game environment map pointing out some items that needed to be found in order to help her complete the actions needed to activate the questionnaires in that game, and specified how she should use the items.

After finishing all of the games the EQ4 was filled out separately as she had not activated and completed the LQ3 from the Achievement game. I decided that for the next tests to be carried out I would not re-build the game with bug-fixes or inclusion of the missing content (which is described in 6.2 Bugs, missing content and glitches). This decision was based on the fact that it would be harder to compare the results from the different test side by side as the product and the experience of it would then change. However, as already stated (6.1 The testing) after this test I decided to conduct the rest of the tests with me being present and helping the participants when needed and tell them when and what was required to activate the questionnaires, as for them to have a reference point in how much work the needed to put into each game.

6.1.2 Participant 2

The second participant was the first of the personally conducted test in which I was present while the participant played the games. There were no problems of notable character, and the only bug that was encountered was the one in the 'Immersion' game as already described above, although the character did not fall through the environment, and the game could continue.

There were only few misunderstandings in regards to the descriptions featured on the screen where the participant was e.g. under the impression that the competitive mode of the 'Social' game (Maze flyer) meant that one should try to get first to the goal, where it instead was specified that the goal was to gather boxes for points, and that the only benefit from reaching the goal first was an extra 50 points. However on a second play through he did play it as intended. As a further note on the 'Social' game it has to be stated that I took the role of the second player as there were no other persons present to take up this task.

With regards to the 'Mastery' game (Defend your castle), where the first participant had not paid attention to the detail in how the soldiers were spawned, the second participant was not that observant either. When asking about the lack of soldiers I had to point out that he might not have enough food. Questions were furthermore asked which could be explained from simply bringing up the game guide that was implemented in the game (ref), which indicates a lower attention level to the descriptions featured in the game(s).

For the 'Creativity' game (Simulation explorer), I guided the participants in a similar matter as I had the first participant, which lead to what I believe to be a much similar experience with this game between the first and the second participant. The second participant, however, tried a bit more of the gameplay in relation to the building mechanisms featured in the game.

As a final note on the gameplay for this test, the second participant is the only one who was able to finish the entirety of the 'Action' game (Mercenary), and was quite adequate in killing off the enemies which proved too hard to kill for all other participants.

My presence and the fact that I could gently notch the participants actions in the games lead to a smoother gameplay than the first participant had experienced. This naturally creates a bias that I became this involved with the test, but the alternative was that the test would simply take too long, which would most likely lead to a disconnection between the participant and the project product. This test still had to be split up on two consecutive days as the test was started late in the day and the test person became naturally fatigue. There was no notable difference in his motivational level from day one to day two. This was an aspect which I could not gather data on in regards to the first participant as I could not observe her physically.

6.1.3 Participant 3 and 4

Participant three and four were tested sequentially at the same time. It was still required, however, to test on two consecutive days as the test was started in the early evening and the participants had to get up early next morning to go to work. The motivational level of the two participants did not differentiate notably from the first test day to the second test day.

They were seated on the same side of a table with me in the middle in order to be better adequate to help them. As opposed to the other two participants who had played the games in a consecutive row (Action-Social-Mastery-Achievement-Immersion-Creative) I had them play the 'Immersion' game first (The cursed land). The reason for this was that neither of the two participants normally plays any computer related games at all, and as such I intended for them to get a better hang of computer game controls (normally mapped out by the WASD, when a game is not purely mouse controlled). The 'Immersion' game only offers the option of moving around using the mouse to look around and the WASD keyboard keys to move, with the additional feature of GUI buttons that are used in the game. I deemed that this game would be the easiest for them to play in relation to learn how to use the controls. It has to be noted that the bug in which the character in the 'Immersion' game is slung towards the wall it still hit face first as it did in the first and second participants' games. However, the character did not fall through the environment. This has only happened with the first participant's play through.

The participants used two different computers to play the games where one is an upper-end computer better equipped to handle the amount of dataflow which is required by the games, and as such features almost no lag. The other computer was a lower-end computer which could only be used for some of the games in which the participant would not experience severe lag. As such, the participants had to exchange test computers (which was done the second day of testing) in order for both to complete all games.

However, participant 3 experienced too much lag on the lower-end computer when playing the 'Mastery' game (Defend your castle), even though the computer should have been able to run it with only little lag. This meant that when reaching day zero in the game (Figur 61) it lagged so much that the troops could not reach their designated place, as they kept leaping over it instead, never standing still, which was a coded requirement for the battle to even start. This meant that the participant had to leave the game without witnessing the end, but the LQ3 of that game had already been filled out,

and as such there was no reason to play the game again. As a way to try and counteract a feeling of non-completion within the participant, I noted to her what the end result of the game would have been, if the soldiers had been able to attack.

For the 'Social' game (Maze flyer) I took the part of the second player when participant 4 reached that game, while the previous second participant was present to take the second player role when participant three played it. There was no notable difference in the play through of the 'Social' game for participant three and four as previous second participant carried out the same role as I had when he had played the game.

When getting to the 'Creativity' game (Simulation explorer) there was a difference in how the participant played this game, which also relate to a problem with the lower-end computer. Firstly, the fourth participant was playing the game on the Lower-end computer. This resulted in the mini-map refusing to appear as it should when pressing the M-key (Figur 102). As such it was hard to guide him to the locations at which he could find the needed objects to complete the game. This lead to him exploring more of the games world, and without supervision (as I was attending participant three) he found one of the objects needed on his own. Later, the computer for some reason had the mini-map working, and here it was easier to guide him towards the other needed object. When participant 3 was playing the game she was for a large part unsupervised, but this was not due to me being too busy with participant four. This was due to her own motivation as she found the feature of running around to find objects fun. She was, however, the first of the participants who had a problem in the game's labyrinth (Figur 101). When creating the games I had, as already stated (Figur 99), given hints to how to solve the labyrinth in the game menu. The other participants were able to complete it just from this explanation, but participant three for some reason kept missing the final room in the second part of the labyrinth. She had to run it through multiple times as she apparently kept missing a hallway when going around.

A notable bug that occurred in the 'Action' game while participant three was playing it was that when her character died, for some reason the game did not load at the point a player would end up at when completing the tutorial (since she had not been saving the game), but sent her character all the way back to the tutorial level, which could not be completed as the dialogue did not reappear. This meant that the game had to be reset. In order for her not to be completely thrown off the test, i speed-ran the character back to the point at which her character had been killed. From here she proceeded to the LQ3 although she expressed unhappiness with losing the progress she had made up until then.

When conducting the test with two participants at once, situations occurred in which both required my attention and one had to wait for my help. This did not seem to cause any notable frustration, stress or motivational drop. A notable point in regards to this is that the two participants, although seated next to each other with barely a meter in between, became so focused on the games that they could each make a statement and/or question directed towards me without realizing that they were

talking over each other. When pointing this out they seemed surprised not to have noticed it. This seems to suggest that it should not have had much of an effect testing both participants at once.

There were no other notable difficulties during the conduction of this test except that both participants found the 'Action' game (Mercenary) a bit too hard for comfort, and although they did experience most of the gameplay, none of them finished the game, but stopped when reaching the LQ3.

6.2 Bugs, missing content and glitches

Beyond the bugs already described in the above, this section will go through some minor bugs, forgotten content and glitches in the game.

6.2.1 Cows

One part which could both be described as a bug and as forgotten content is the in-game cows (Figur 80), which is featured in multiple of the games. What was supposed to be was that the cows would move around on the ground with gravity affecting them and have roughly the same size as the in-game character. However, when implementing the cows in the 'Achievement' game (submarine adventurer), the prefab cow was accidentally given a size half of what it should have been in the other games, as the cows needed to be smaller in this specific game. Furthermore the effect of gravity was removed from them in this game, which was also accidentally added to the prefab cow. As such, the cows in all the other games became small objects which floated around in the air (Figur 107).
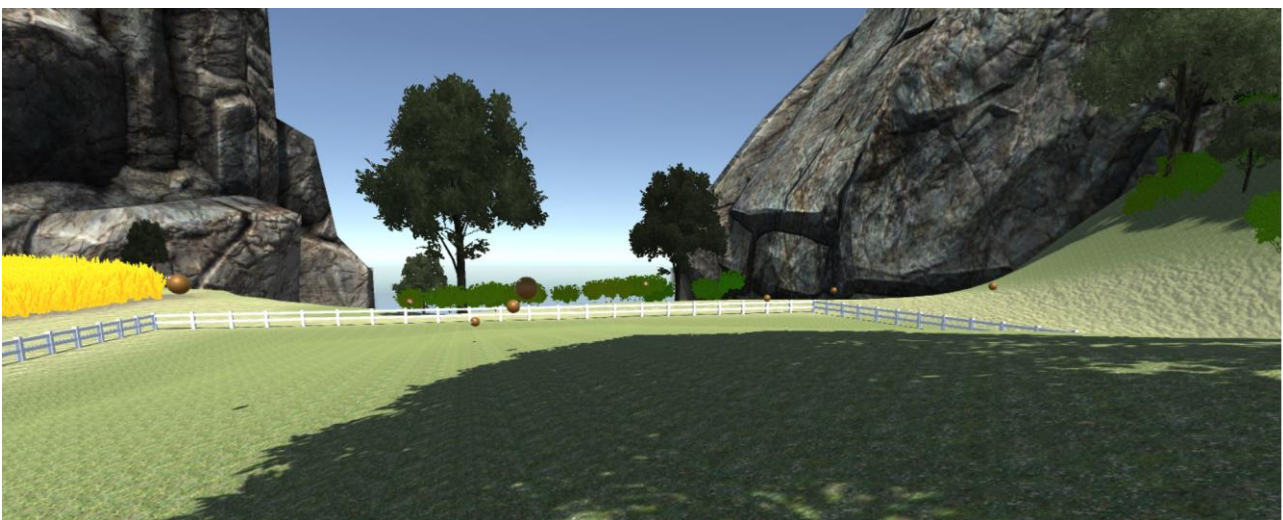
Figur 107 The cows are hovering over the ground with no gravity effect

Consequentially this also meant that the 'Creativity' game (Simulation explorer) could most likely not be completed, as the player needs to use the cows as a form of raft (5.2.6.1.4 The design choices) to reach the desert part of that game's world. It is however untested whether or not it would be possible to still use the cows, only as flying objects instead of floating objects, as they will move down to the player when holding wheat (Figur 108).

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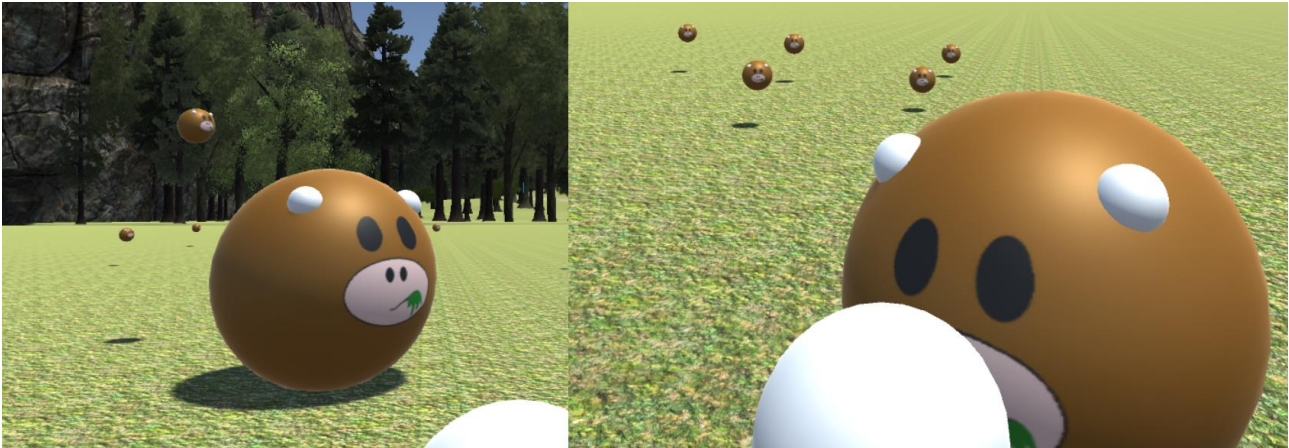
Figur 108 Floating cows in the 'Creativity' game, where the big cow was fed some wheat. On the left side the cows are minding their own code, while they are chasing the player on the right picture, leading them down to the ground

6.2.2 Visual references in the labyrinth – 'Creativity' game

A content that was planned for in the 'Creativity' game, but was forgotten during the designing and implementation was visual referential features in the labyrinth (Figur 101). Here an original idea was to put in plants, lamps and other objects, which would help the players getting an idea about where they had already been in the labyrinth (an example of this is presented in Figur 109).
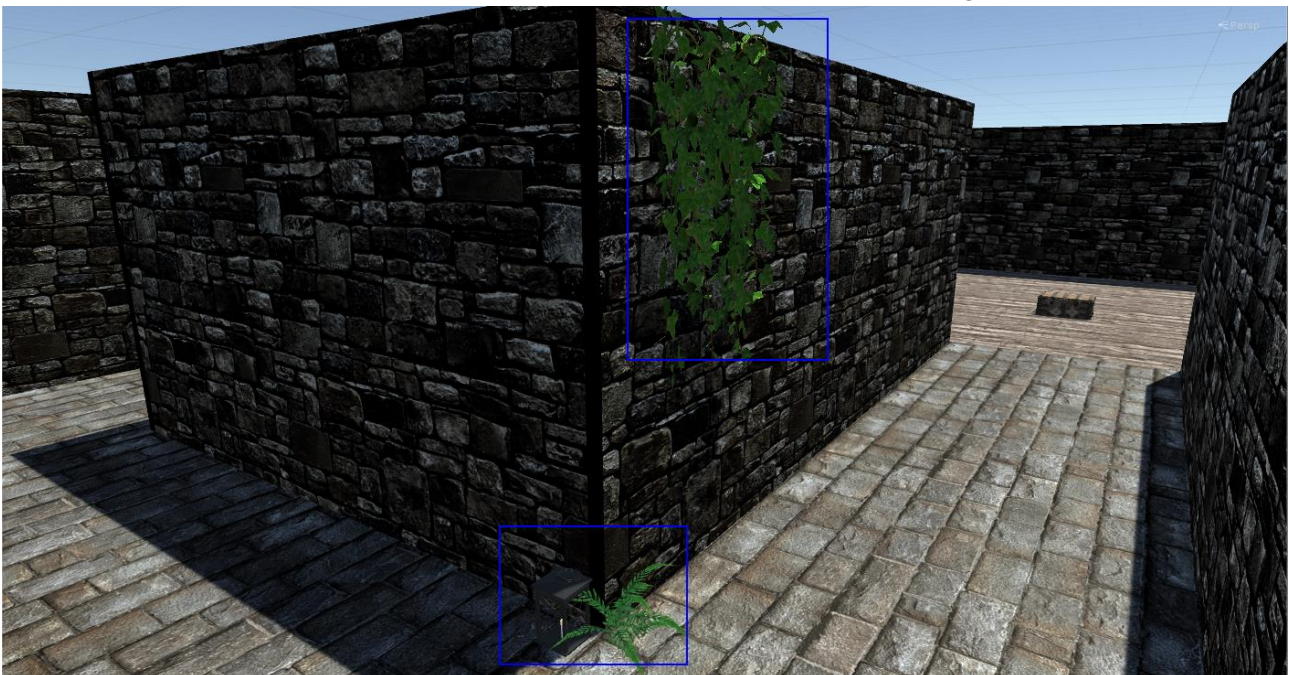
Figur 109 An example of how objects could have been used as reference points, where in this case a lamp, some fern and ivory has been placed

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As the game menu featured a hint towards completing the labyrinth made these visual reference points unnecessary however, but for a proper game without any hints, these cues would have been necessary to implement.

6.2.3 House marker, player marker and damage from explosions – 'Action' game

A content which was missing from the 'Action' game (Mercenary) is when a player gets the objective of blowing up another character's house (5.2.1.1.4 The design choices). Here it was meant, and is also stated in the mission, that the house to be blown up is marked with a red dot on the map. However, I never got around adding in this dot, and as such it was missing from the game the participants played. Another missing content in this game was that the character played in the game should take damage from explosions when being too close to them. This feature was simply forgotten in the implementation process. Hence a player can simply stand still and spawn the 'boom boxes' (Figur 30) and detonate them as is without fearing damage.

6.2.4 Missing colliders, dialogue bug – 'Immersion' game

In the 'Immersion' game (The cursed land) the cities in the desert (Figur 92), was not given adequate colliders. This meant that players can go through most of the walls. As opposed to this the prison in the desert (Figur 93) had been given colliders, but the UNITY-engine's collision engine is apparently not adequate in stopping players from going through these colliders either. Furthermore a bug which occurred in the 'Immersion' game was that if a player accidentally pushed away another character which they were supposed to talk to, the dialogue mechanism stopped functioning as it is triggered by proximity between the player and the other character. The buttons, however, which was used by the participant to go forth and back in the dialogue was still present, and would not go away. There are two versions of this bug: either the participant's player movement controls were turned off during the bug or they were still on. If they were turned off, the participant would have no other option than to reload the game as there was no other way to re-activate the movement controls. Fortunately no participant ran into this version of the bug. If the movement controls were still on, then the participant could re-activate the dialogue, but only if they went and spoke with a different character first, thereby re-setting the dialogue code.

6.2.5 Glitch in movement and quad blockers – 'Achievement' game

In the 'Achievement' game a glitch frequently happened, which most likely has to do with the collision detection made by the UNITY-engine. The glitch happens when the player driven submarine collides with the terrain while being in motion (i.e. the player is pressing W or S to make the submarine move). When triggered, the submarine will start to skew its path rather than just sailing forward or backward, which makes it more difficult to control. In an attempt to eliminate this type of glitch, I implemented some measures to try and stop this. An although this implementation was partly successful, it still was not enough to stop this glitch to occur, although it would seem that it hindered the glitch from becoming permanent in the game. Furthermore the background quad (Figur 65) placed in this game as a mean to stop the camera from rendering the horizon, was not close enough to the camera in order to work as intended when the submarine reached closer to the surface. This meant that when reaching the surface, or getting close to it, the camera could not render the bottom of the quad, which meant that the horizon could be seen instead (Figur 110).

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Figur 110 The submarine has moved up to the surface and is on its way down. Here the Quads can be shown to not be adequate in covering up the horizon

6.2.6 EQ4 background

When making the RQ2, LQ3 and EQ4 they were all intended to have a white background in order to make it easier for a participant to read the text featured in the questionnaires. However, when coming around to the EQ4, it appears that some bug happened when the game was build. Hence the white background never showed up, which made it hard to read the text in the EQ4. As the reason for this bug was unknown when it occurred, I chose to not try and correct it and make a new build firstly from the perspective of saving time, but also from the perspective that the EQ4 only featured one page, and that I was present during the tests, which made any questions regarding the text a participant might have easy solvable. Naturally the background of the menu text was a bit annoying for the test participants upon completing the EQ4, but it did not appear to be notable in relation to having an effect on their answers.

6.2.7 Music

Music was initially intended to be featured in the games; however I did not have the time to complete this (which is why such a part is omitted from the 5 Design and implementation chapter). The reason for bringing the subject up here is due to the fact that sound cues could have helped players in the games that feature stealthy enemies. In the 'Achievement' game sound could have been used to indicate when a fish (Figur 70) was approaching, which would help a player to spot it if it came from behind the player's camera. In the same game a sound cue could also have been helpful in regards to the whales swimming around, where a player may locate them more easily as they either wise only can locate them by accident, or spot them when they activate the sonar (Figur 77). Another game that would have benefitted was the 'Immersion' game, where the monster roaming

the desert (Figur 88). The monster would pretty much show up from nowhere without a participant's knowledge as it would hunt them over a larger distance, making it almost always attack from behind. A sound cue here would help the player to know that they should try to escape.

There were no other bugs noticed or other missing content that needs to be described, and as such I will present the results from the tests in the next subsection.

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6.3 The results

In this subsection the results from the test will be presented. Each game's results will be presented as its own entity. The EQ4 that is received upon finishing all the other questionnaires will be presented last in its own subsection. The results gathered from the games will be structured in the following way: Firstly there will be a graphical depiction in which all of the data from the RQ2s will be presented, except the selected statements about why a test participant rated their CoDe as they did and comments on why a test participant find the controls broken or challenging. The graphical depiction will look as the example presented on the image below here:
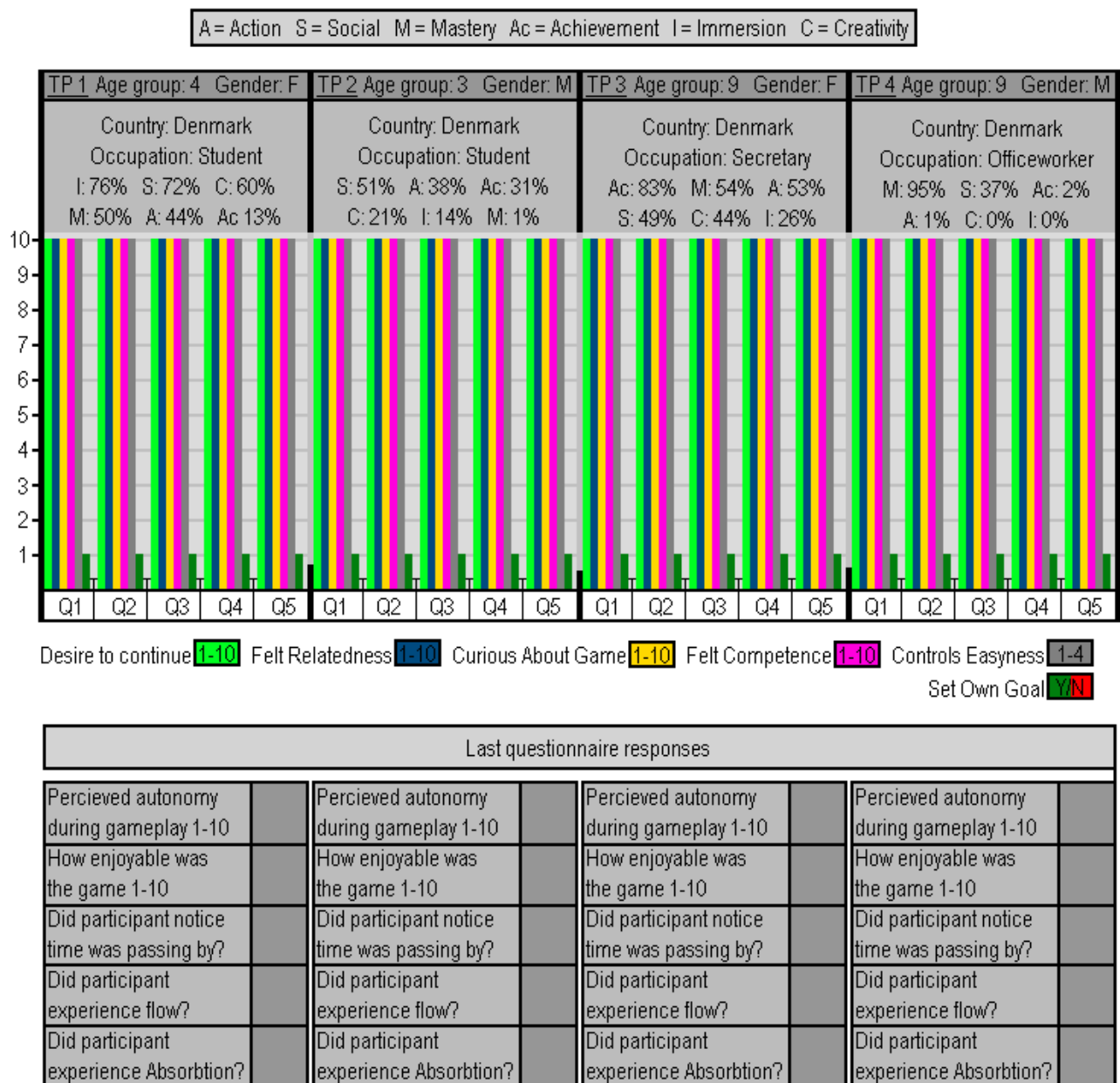
As can be seen the four participants has been lined up from one to four, with their results directly below them. For this depiction I have chosen to include their demographic gathered data, in order to make it easier when referencing this when interpreting the data. As can be seen the RQ2 data are

featured on a graph going up to ten in correlation with the range which the participants can choose. Also included on the graph is the depiction of whether or not a participant set their own goal (green) or not (red), which is indicated by the small green line seen on the graph. The difficulty of the controls is also featured on the graph although the maximum value for this feature is four and not ten. As such the graph should provide an easy overlook of how successful a game was for each participant where higher lines indicate how well the game was perceived. Below the graph some of the LQ3 data are featured in a table. I have chosen to present the data regarding autonomy, the enjoyment of the game as a whole, time perception, flow- and absorption experience in this table as they are quantitative data which will, just like the graph, give a quick overview of the quantitative data about how well the game was received by the participants. The grouping of these data in the table and not the remaining data was made from the perspective that they fit together and does not need much interpretation.

The selectable statements will be featured in other tables below, where the first row of a table will feature the participant's number. The following rows will feature all statements that were selected by the participant. However, in an attempt to not make the tables too incomprehensible, there will not be a table for each of the questionnaires featured in a game, but extra columns will be put in, in accordance with how many questionnaires a game featured (i.e. all the RQ2s + the LQ3), where these columns will be given an 'X' to indicate in which questionnaire that a statement was selected. A simple example of this is given here in this table below:

P1	Q1	Q2	Q3
Hate the upgrades		X	
I like the story	X		X
I want to progress		X	X

P2	Q1	Q2	Q3
I want this game to be over	X		
Want to kill characters		X	X
Hate the upgrades	X	X	

After presenting these tables, the participants' negative/positive comments concerning the CoDe aspect of 'Activities' (referred to as tasks/missions/challenges in the LQ3 5.1.5 The last questionnaire) will be given their own table such as to easier compare the participants' comments with each other. The first row will again feature the participants' number, where the second row will feature the selected statement(s) about the CoDe aspect of 'Affects' in relation to the 'Activities' featured in the game. A simple example of this is presented in the table below. As a side note there will be instances in which I need to comment on the response of a participant in order to make it more clear what the participant means. These comments will be written inside [*In cursive*] such as it will be easier to distinguish them from the actual participant comments.

Participant number	P1	P2	P3	P4
'Affect'	Bored, fun	Empathic	Fun	Annoying
Positive about 'Activities'	Looking for treasure was fun	None	None	I liked bursting bubbles
Negative about 'Activities'	Hated that I had to shoot a fish	Did not like to explore in this game	None	None

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After this the data in regards to challenge for a game will be presented, where it will firstly be featured whether or not a participant had any comment in regards to broken/challenging controls. Then the data on how challenging the game is perceived to be if the controls were perfect along with the participants' perception of how important it is that the game offers a serious challenge to a player. Again this will be featured in a table to create a clearer overview and make comparisons between participants easier with the participants' number in the top row as shown in the simple sample below:

Participant number	P1	P2	P3	P4
Comment if controls were perceived to be broken/challenging	It was difficult because the mouse was jagging	The shoot function was not easy to use	None	None
If the controls were perfect, how much challenge does the game provide 1 = really easy, 10 = really hard	4	5	8	2
How important is it that the game should provide a serious challenge for a player	1	10	3	5

The data about the sensing element of the CoDe will be presented hereafter where the four different comments about the visual environment overall, the visual feedback, characters appearances and other comments on the visuals will be shown in one table. A simple sample of these tables can be seen below:

Participants number	P1	P2	P3	P4
The visual environment overall	I liked the fog	It looked pretty	It was not diverse enough	The trees looked strange
The visual feedback	I did not notice it	None	I liked the fade in/ fade out	None
Characters' appearance	I was a white ball	The characters were not unique enough	I could not tell the characters apart	None
Other comments on the visuals	None	The caves looked nice	I would have liked to see some birds	None

The last data that needs to be represented from the LQ3 is comments on what could make the game better in relation to the secondary motivators (ref). This will equally be presented in a table like the simple example shown below

P1	P2	P3	P4
Some comment about destruction	Some comment about strategy	Some comment about destruction	Some comment about challenge
None	Some comment about fast paced gameplay	Some comment about story	None
None	None	Some comment about achievements	None

The EQ4 will equally be presented after the game data in its own subsection. Here all the answers will be featured in one table together. This data is concerned with the intrinsic/extrinsic motivation, which game was the liked the most/least, what game the participant (if any) would like to play again and how intrusive and annoying the test is perceived to be, along with any additional comments the participant may have on the test method. A simple example of this table is featured below:

Participant number	P1	P2	P3	P4
Participant was mostly intrinsic motivated	yes	no	no	yes
Most enjoyable game	Action	Action	Social	Mastery
Least enjoyable game	Social	Mastery	Achievement	Social
Which game would the participant like to play again	Action	Social	Mastery	Mastery
Participants perception of the intrusiveness of the test method where 1 = not intrusive at all, 10 = extremely intrusive	1	2	3	4
Participants perception of how annoying the test method was where 1 = not annoying at all, 10 = extremely annoying	9	8	7	6
Other comments on the test method	Hated it	Loved it	Indifferent	None
(Continued)	More questions needed	Clearer formulation needed	None	None
(Continued)	None	Fewer questionnaires is better	None	None

As such, this is how I will present the data in the below subsection, where the order of the games is the same as they are featured in the project product from left to right: Action, Social, Mastery, Achievement, Immersion and Creativity, with the following of the subsection concerning the EQ4 results.

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6.3.1 Action game – 'Mercenary'
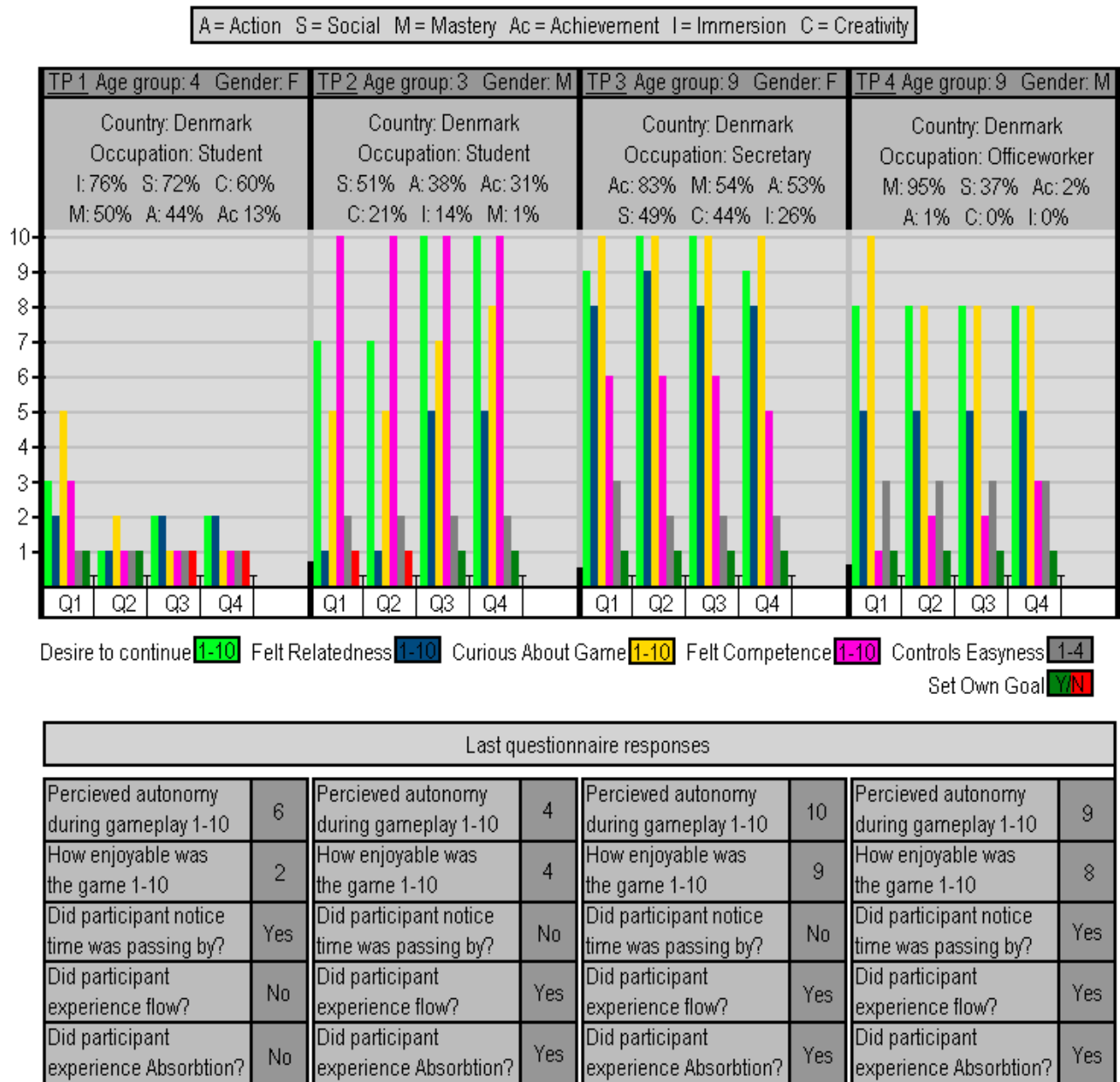
Figur 111 The figure shows the results from the RQ2, except for the answers to why a participant had the continuation desire level as they had, and also features some results from the LQ3 in the grey table

P1	Q1	Q2	Q3	Q4
I do not like the challenges provided in this game	X			
I find the characters boring	X			
The game does not give me the desire to complete/win it	X			
I just want this game to be over		X	X	X

story will develop				
I want to progress in this game	X		X	X
I want to complete/win this game		X		
I want to continue destroying things			X	X

P2	Q1	Q2	Q3	Q4
I am curious to see how the	X	X		

P3	Q1	Q2	Q3	Q4
I want to solve the game's challenges	X	X	X	X
I want to explore the game's environment	X	X	X	X
There are things I want to experiment with in the game	X	X	X	X
I want to continue destroying things	X	X	X	X
I enjoy the chaos I create in the game	X	X	X	X
I find the story compelling and well told	X	X	X	X
I am curious to see how the story will develop	X	X	X	X
I like the way the story is revealed	X	X	X	X
I would like to see more to the characters	X	X		
The characters amuses me	X	X	X	X
I want to complete/win this game	X	X	X	X
I want to progress in this game	X	X	X	X
I want to become stronger in this game	X	X	X	X
The game allows for enough exploration opportunities		X		X
I want to kill all/some of the characters		X	X	X

P4	Q1	Q2	Q3	Q4
I want to solve the game's challenges	X	X	X	X
I enjoy the chaos I create in the game	X	X	X	X
I find the story compelling and well told	X	X	X	X
I am curious to see how the story will develop	X	X	X	X
I like the way the story is revealed	X		X	X
I would like to see more to the characters	X			
I want to complete/ win this game	X	X	X	

Table 3 These tables show what a participant marked as their reasons for rating their continuation desire as they did

Table 4 This table shows participants felt 'Affect' in relation to the 'Activities', and their positive and negative comments about them

Participant number	P1	P2	P3	P4
'Affect'	Dissatisfying, Annoying	Empathic	Fun, Enjoyment, (positive)-tension	Fun, Enjoyment, Satisfying, (positive)-tension

Positive comments about 'Activities'	The challenges would have been pretty good if the shooting was at all usable. Interesting enough premise, could probably be fun with some wanton destruction of the watermelon monsters. watermelon pieces everywhere. Not half bad environment, blocky theme is nice.	Blowing up the villagers house was quite fun. Revenge. Rounding up a large amount of enemies and blow them to smithereens is fun as well. Fast way of clearing them out.	Good feature interacting with citizens and shopkeepers to collect weapons and bullet. Good challenge killing enemies. Quests [*are*] funny. Story is fine.	I like that I can run from the enemies and hide
Negative comments about 'Activities'	Shooting was terrible, would not work properly, almost impossible to aim and hit. Ran through most of the map to escape hordes of watermelons (which was actually kinda funny on its own). Quests seemed a little weird. I could push trees once i had collected too much timber? like literally push and topple them over. It's not a bad concept, the shooting just kind of ruined the core of it.	None	None	None

Table 5 This table presents how challenging a game was perceived to be if controls were easy/intuitive, how important it is that the game give a 'serious' challenge to players and what comments participants had on the controls if any

Participant number	P1	P2	P3	P4
Comment if controls were perceived to be broken/challenging	The mouse movement is excessively sensitive and jagged as well. Movement is difficult and frustrating	To have or not to have a reticle. That is the challenge.	None [*however it was verbally stated that it was hard to aim and shoot*]	None

If controls were perfect, how much challenge does the game provide 1 = really easy, 10 = really hard	5	3	7	6
How important is it that the game should provide a serious challenge for a player	4	4	7	8

Table 6 Comments on the 'Sensing' in the game

Participant number	P1	P2	P3	P4
The visual environment overall	Blocky theme kinda nice. Textures gave off a Unity vibe, but yeah.	Blocky, but simple	Fine	Ok
The visual feedback	Fine, not a whole lot of them.	Lacking. No pointer for the house to blow up on the map [*this has already been evaluated earlier in 6.2 Bugs, missing content and glitches*]	Better illumination of citizens [*shopkeepers and quest villagers*] to meet [*needed*]. Triangular marker instead of a dot on the map. [*the participant is referring to the red dot on the mini-map which indicates the position of a player*]	Fine
Character's appearance	WATERMELON MONSTERS, pretty nifty idea	He's a white block. He could be naked for all I know.	Ok	Funny
Other comments on the visuals	Simplistic, not terrible, but very.. Unity [*the participant is referring to the game engine in which the game was made*]	None	None	None

Table 7 Comments in regards to improvements in the games as related to presented topics

P1	P2	P3	P4
Overpowered enemy	None	destruction visuals could be better	None
Hard to do shooting		strategy can develop	
Meh story		killing enemies could trigger enhanced weapons, or faster moving (me) soldier [*i.e.*	

		make the played character faster]	
Didn't get to experience much destruction...		After the tutorial level it was difficult to hit enemies	
Wasn't interesting with monsters impossible to kill.			

6.3.1.1 Discussion of results

This game was targeting the 'Action' player type. None of the participant had a score higher than 55% in this primary player type and P4 had the lowest score of 1% in this type. As such the results were expected to show a medium engagement from participants P1, P2 and P3, and a very low engagement from P4. This was however not the case. P2 showed a very high engagement for this game, where P3 and P4 showed above medium engagement for the game, with P1 showing a low engagement for the game.

The responses in regards to 'Relatedness' showed a moderate feeling for this SDT component across the participants. As 'Relatedness' was never a major part of the game this makes sense, and in relation to the player types, it also makes sense that P1 (who is largely motivated by 'Immersion' and 'Social' types) felt the least amount of 'Relatedness'. For P3 who had a high score in the 'Action' type, it made sense that she was also the participant who rated the highest amount of 'Relatedness'. As such I will largely regard this component to have been implemented correctly for the participant group.

For the element of curiosity in relation to the game, this seems to correlate well with the reported responses of participants' CoDe. As such, this is the first indicator towards this feature to be suggested as having a close relationship with the CoDe element.

In relation to the 'Competence' responses, these seem to not be correlational with CoDe such as the curiosity element. It also does not seem to be entirely correlational with the controls either as P2 rated a very high feeling of 'Competence' while rating the controls challenging, and P3 rated a medium competence feeling while still perceiving the controls to be rather difficult. Moreover P4 rated a rather low (though inclining a bit through the gameplay) feeling of competence, while stating that the controls were easy. As such not much can be concluded from this other than clearer results may be revealed if there had been more participants.

For the results in relation to the controls, nothing conclusive can be stated as they were perceived as being broken, challenging and easy. I will in any case argue, from the perspective of the observed gameplay sessions, that the controls should be made easier as in relation to shooting (a reticle could be added) and the movement of the enemies which were controlled by the navigation feature imbedded in (UNITY, 2017). The movement of the enemies in particular, was unpredictable as to when they got close to the participants' character where the only option left was to run, shoot and

hope to hit the right targets before unlocking the weapons of the 'boom boxes' and the 'energy shield' (5.2.1.1.4 The design choices).

When looking at the results presented in the table presenting why the participants rated their CoDe as they did, it seems to be well indicated as to what participants found enjoyable (or not enjoyable) in the game. It is however hard to use these results for much else, as this was meant to be used as quantitative data, where the results would be used to figure out how a games 'Activities' affected participants correlative and how this ultimately could led to changes to the game.

In regards to the SDT component of 'Autonomy', it does not seem that a high amount of this leads to a greater CoDe across participants. As such P1 rates a fairly high perception of autonomy, but does not have high ratings of CoDe, where P2 has a lower rating of autonomy feeling, but had a higher CoDe. P3 and P4 rated both autonomy and CoDe high. The 'Autonomy' component, however, may relate more to participants player types, but more testing in this regards would be needed to look into that hypothesis.

For the rest of the qualitative comments in the results, these mostly appear to be useful as to improve the game, or maybe take it in a new direction (i.e. making serious business out of the water melon suggestion), despite what the primary player types were rated as. If this does not change across the other games' results, the subject of discussing these results will be collapsed, as the suggestions are relatively clear as to how they could improve/change the game.

For the challenge aspect of the results, these appear to correlate with the participants player type (e.g. P4 want more challenge), and as such these results may be useful as to tweaking the gameplay towards different player types, where more challenge e.g. could include a better experience for 'Mastery' types. If the same tendency of challenge perception appears to be the same in the other games' results, this will be collapsed. In relation to noticed time, flow and absorption, these results seem to correlate well with the engagement of the participants. If this result does not change in the other games' results, this subject will be collapsed.

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6.3.2 Social game – 'Maze flyer'
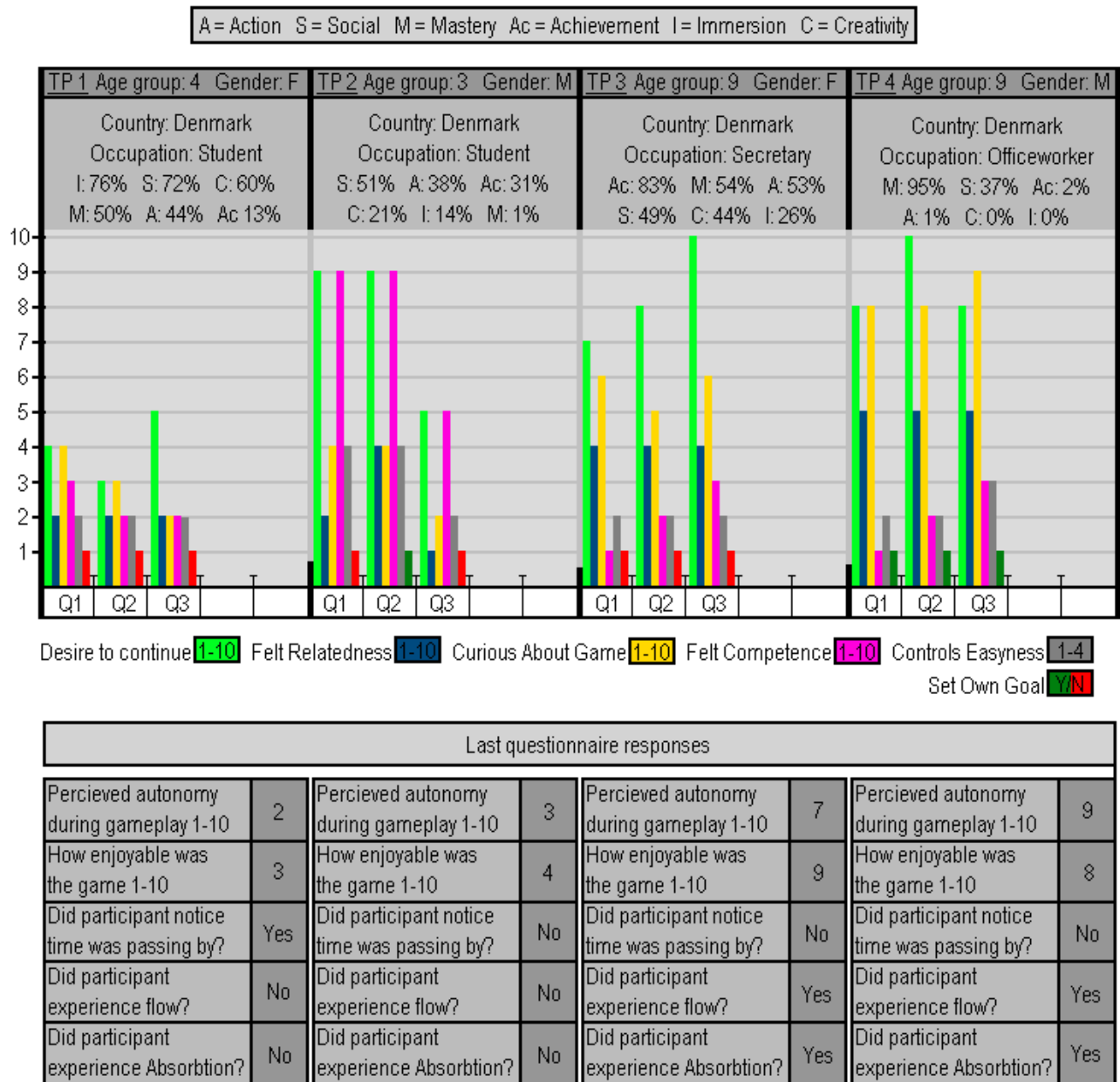
Figur 112 The figure shows the results from the RQ2, except for the answers to why a participant had the continuation desire level as they had, and also features some results from the LQ3 in the grey table

P₁	Q₁	Q₂	Q₃
I like the social aspect of this game	X		X
I don't like to compete in this game	X		
The game does not give me the desire to complete/win it	X	X	
I like the cooperation in this game			X

P₂	Q₁	Q₂	Q₃
I want to complete/ win this game	X	X	
I like the cooperation in this game			X

P₃	Q₁	Q₂	Q₃
I like the social aspect of this game	X	X	X
I like to compete in this game	X	X	X
I want to complete/win this game	X	X	X
I like the cooperation in this game			X

P₄	Q₁	Q₂	Q₃
I like the social aspect of this game	X	X	X
I want to complete/win this game	X	X	X
I like the cooperation in this game			X

Table 8 These tables show what a participant marked as their reasons for rating their continuation desire as they did

Table 9 This table shows participants felt 'Affect' in relation to the 'Activities', and their positive and negative comments about them

Participant number	P₁	P₂	P₃	P₄
'Affect'	Fun, Dissatisfying, Annoying	Fun, Boring	Fun, Enjoyment, Satisfying, (positive)-tension	Fun, Enjoyment, Satisfying, (positive)-tension
Positive comments about 'Activities'	The cooperation was kinda nice.	Racing for points and time. Trying to get both is challenging and a fun goal. The co-op is fun, because you have to work together.	The boxes are hard to hit, i like the challenge	It's an easy and funny task to shoot. And then not too easy to fire the gun and control it.
Negative comments about 'Activities'	Movement was making the game kinda annoying and hard	Oh reticle, where art thou? The first race was a bit boring. Just gather points, don't get caught by the eraser.	None	None

Table 10 This table presents how challenging a game was perceived to be if controls were easy/intuitive, how important it is that the game give a 'serious' challenge to players and what comments participants had on the controls if any

Participant number	P₁	P₂	P₃	P₄
Comment if controls were perceived to be broken/challenging	Speed is slow, movement is very fast, it is confusing to play.	None	The controls are not easy to get hang on very quickly.	Not easy to control
If controls were	7	4	7	5

perfect, how much challenge does the game provide 1 = really easy, 10 = really hard				
How important is it that the game should provide a serious challenge for a player	3	5	7	6

Table 11 Comments on the 'Sensing' in the game

Participant number	P1	P2	P3	P4
The visual environment overall	passable	Simple and repetitive	Fine	Good
The visual feedback	Not sure if there was any	The lasers from the eraser [*from the competitive part of the game*] were good, and the disappearing boxes were nice.	Collecting a box is not very visual, could be better with e.g. puffs or the like	Fine
Character's appearance	Decent	Simple, love the twin motors.	Ok	Fine
Other comments on the visuals	None	None	Enemy is too big in comparison with character [*participant is referring to the 'flaming boxes' in the game*]	None

Table 12 Comments in regards to improvements in the games as related to presented topics

P1	P2	P3	P4
Visual feedback on hitting enemies [*needed*]	Increase the erasers speed	monsters should explode when shot or puff or fall down	None
Visual feedback on picking stuff up is needed			

6.3.2.1 Discussion of results

This game was targeting the 'Social' player type. None of the participant had a score lower than 37% in this primary player type and P1 having the highest score of 72%, where P2, with a score of 51%, had this type as the highest ranked. As such the results were expected to show a medium to high engagement from participants P2, P3, and P4, while P1 should have a high engagement. This was not the case. P2, P3 and P4 showed a medium to high engagement for the game, with P1 showing a low engagement for the game.

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The responses gathered about 'Relatedness' for this game was rated low to medium. As such I will argue that this game fails. During the design of this game, it was expected that the feeling in regards to 'Relatedness' would mostly occur outside the game and this can be stated as being a failed design choice. In this regard I am referring to the fact that the game should have been designed such that it sparked more interactivity between the two players. However, I will also have to argue, that the 'Relatedness' question in this regard may have been formulated wrong, as it is not only the game that should foster the feeling of 'Relatedness', but also the interaction between the two players, which may not be clearly understood. In any case further information would have to be gathered in order to figure this out, and how to alternate the game to better suit 'relatedness'.

In relation to the curiosity, this correlated well with the aspect of CoDe, in all participants except P2. Hence the argument, as stated from the results from the 'Action' game, about curiosity coinciding with CoDe is still on the table.

In this game the feeling of competence seems to correlate somewhat with perceived difficulty of the controls. However, as the previous game's result did not have the same tendency, this cannot be concluded as of yet to mean much.

The controls for this game were perceived to be challenging, easy and intuitive. As of such anything conclusive cannot be made in this regard. However, a uniformly statement from the participants were in relation to the difference in the normal speed and how fast the participants could turn around their given character. As such it can at least be stated that the balance between normal speed and turn speed should be adjusted in some way, where more participants could have provided a better answer as to how this should be done.

As written about in the discussion of the 'Action' game's result, the positive/negative statements about the 'Activities' presented in the game seems to be well correlated with the CoDe reported. As such, if there is nothing else to write about this topic in relation to the other games, this will be collapsed from the discussion.

In relation to 'Autonomy it appears again that it is not consistent in relation to CoDe across participants, as both P1 and P2 rates felt autonomy low, but that P2 has a higher CoDe than P1. However, the 'Autonomy' component is more reliable in this game as opposed to the 'Action' game as P1, P3 and P4 had a low/high autonomy level coincide with a low/high CoDe. The 'Autonomy' component for this game, however, seems to lose the value of being more creatable with player types.

The results of noticing time passing, flow and absorption appear to not have a large correlation with P2 for this game, although the other participants still correlated the same as before.

6.3.3 Mastery game – 'Defend your castle'
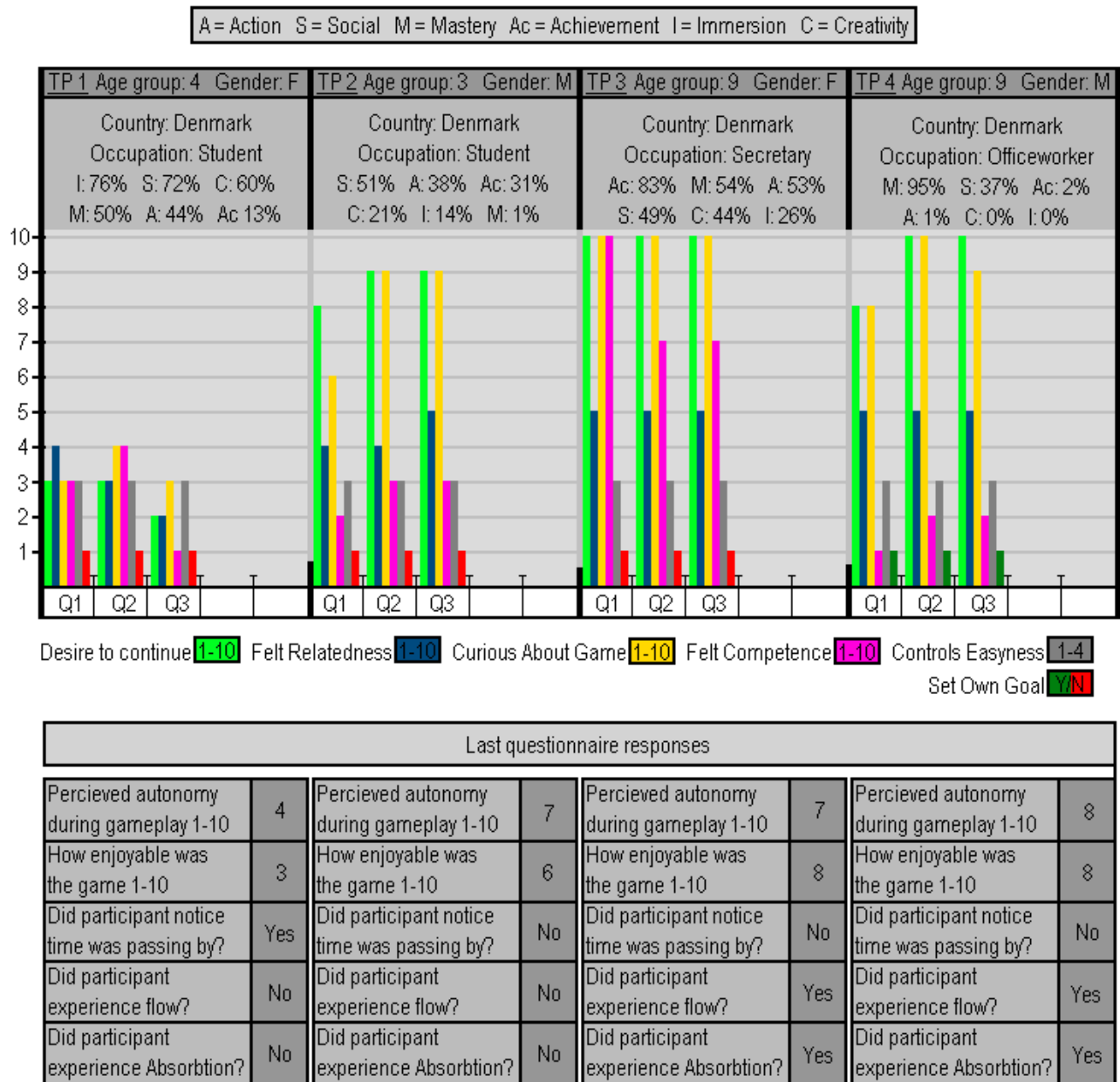
Figur 113 The figure shows the results from the RQ2, except for the answers to why a participant had the continuation desire level as they had, and also features some results from the LQ3 in the grey table

P1	Q1	Q2	Q3
I do not like the challenges provided in this game	X		
I just want this game to be over	X	X	X
I don't like the building aspect in this game	X	X	
The game does not give me the desire to complete/win it		X	
The upgrades are boring		X	

game			
I want to progress in this game	X		
I want to become stronger in this game	X	X	X
I enjoy construction in this game		X	X

P2	Q1	Q2	Q3
I want to complete/win this	X	X	X

P3	Q1	Q2	Q3
I want to solve the game's challenges	X	X	X
There are things I want to experiment with in the game	X	X	X
I want to complete/ win this game	X	X	X
I want to progress in this game	X	X	X
I want to become stronger in this game	X	X	X
I enjoy construction in this game	X	X	X

P4	Q1	Q2	Q3
I want to solve the game's challenges	X	X	X
There are things I want to experiment with in the game	X	X	X
I want to complete/ win this game	X	X	X
I want to progress in this game	X	X	X
I enjoy construction in this game	X		
I want to become stronger in this game		X	X

Table 13 These tables show what a participant marked as their reasons for rating their continuation desire as they did

Table 14 This table shows participants felt 'Affect' in relation to the 'Activities', and their positive and negative comments about them

Participant number	P1	P2	P3	P4
'Affect'	Annoying, Illogical	Fun	Fun, Enjoyment, Satisfying	Fun, Enjoyment, Satisfying, (positive)-tension
Positive comments about 'Activities'	Building is pretty easy to understand even without the progression bar.	I like the building upgrade feature where they change visual appearance.	Funny building your own site. Upgrading is fine.	I like design and the way to build
Negative comments about 'Activities'	I have absolutely no idea why the enemy has 60 soldiers and I have 8 despite my many many barracks. Doesn't make sense.	None	Gameplay is too simple to make re-plays fun	None

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Table 15 This table presents how challenging a game was perceived to be if controls were easy/intuitive, how important it is that the game give a 'serious' challenge to players and what comments participants had on the controls if any

Participant number	P1	P2	P3	P4
Comment if controls were perceived to be broken/challenging	None	None	None	None
If controls were perfect, how much challenge does the game provide 1 = really easy, 10 = really hard	3	5	5	5
How important is it that the game should provide a serious challenge for a player	4	5	5	8

Table 16 Comments on the 'Sensing' in the game

Participant number	P1	P2	P3	P4
The visual environment overall	Decent enough	Works well for a strategy turn based game	Fine	Good
The visual feedback	Not enough	Great feedback on building upgrades	Fine	Fine
Character's appearance	Fine	None	Too simple	Fine
Other comments on the visuals	None	None	None	None

Table 17 Comments in regards to improvements in the games as related to presented topics

P1	P2	P3	P4
None [*participant stated that she did not understood the game well enough to make comments on this, but this aspect has already been evaluated in 6.1.1 Participant 1*]	None	None	None

6.3.3.1 Discussion of results

This game was targeting the 'Mastery' player type. P1, P3 and P4 scored 50% and above with P4 having a score of 95%, where this was also P4's highest ranking type. P2 scored the lowest with 1%. As such the results were expected to show a medium to high engagement from participants P1, P3,

and P4, while P2 should have a low engagement. This was not the case. P2, P3 and P4 showed a medium to high engagement for the game, with P1 showing a low engagement for the game.

The 'Relatedness' facto for this game the results reveal it to have a low to medium appeal. This was expected as this component was not regarded to be important, hence not really designed for. P4, who rated the highest in the 'Mastery' type, was equally medium on his 'Relatedness' ratings, which indicates that should the game be altered, more information about this player type should be gathered as to increase the feeling of relatedness.

For the curiosity aspect, this still relates well to the aspect of CoDe across all participants.

In relation to the 'Competence' component, it is again shown that the relation between competence and difficulty of controls does not appear to have much of a correlation, as was featured with the results from the 'Action' game.

For this game the controls were perceived by every participant as being easy. As such it can be concluded for this group, that these controls were sufficiently made, although it is not clear as to what they are lacking in terms of going from easy to intuitive. It can be speculated however, that as a 'Mastery' game, the participants had to think about every action, which in turn have them focus on the controls as well. As such the controls of the games may not ever be able to cross the line between easy and intuitive. But more research would have to be done into this as to confirm or reject such a hypothesis.

In relation to 'Autonomy' it would seem that the component is correlational with CoDe across participants in this game. The results of noticing time passing, flow and absorption appear to not have a large correlation with P2 for this game, although the other participants still correlated the same as before.

6.3.4 Achievement game – 'Submarine adventurer'
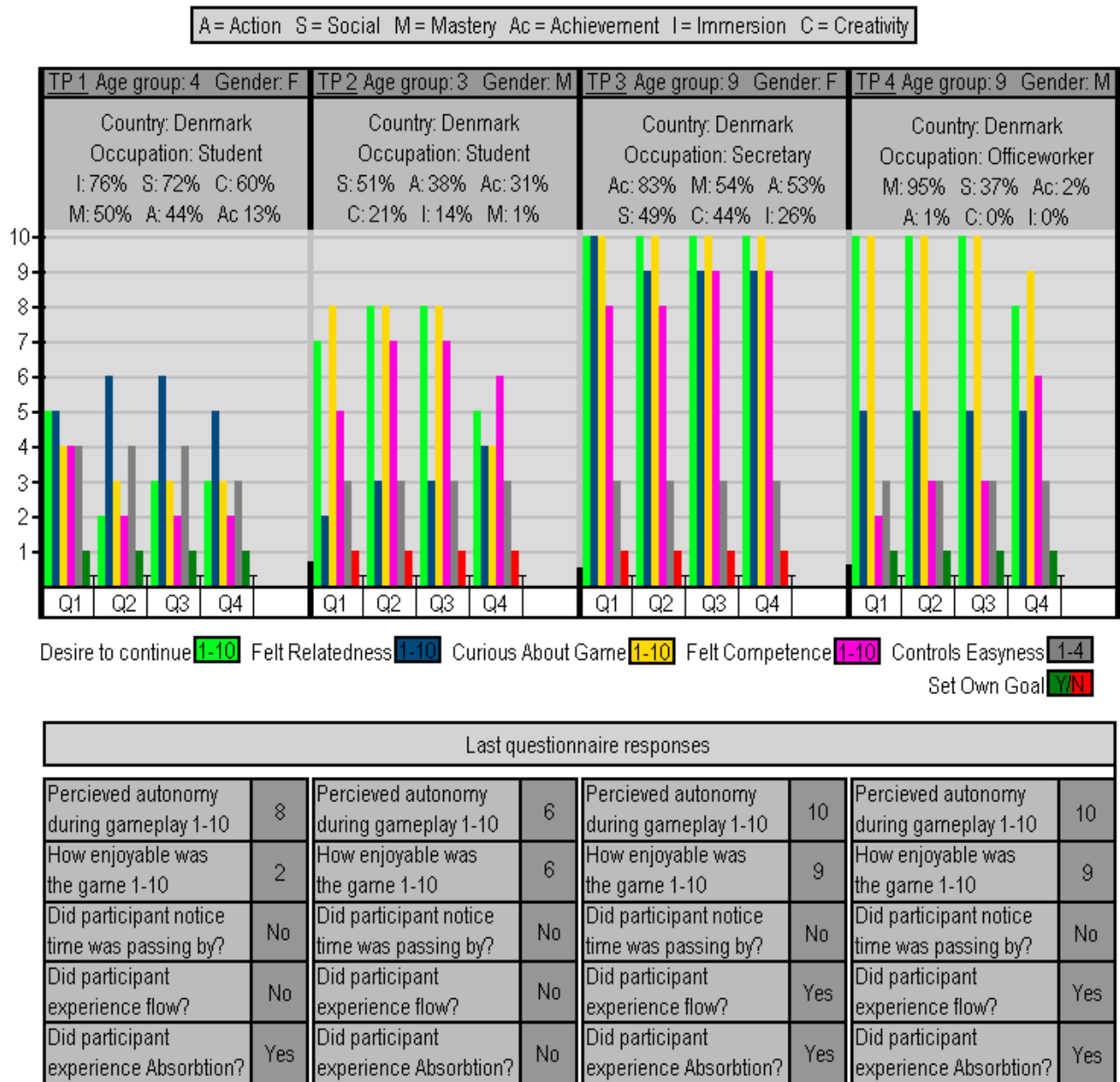
Figur 114 The figure shows the results from the RQ2, except for the answers to why a participant had the continuation desire level as they had, and also features some results from the LQ3 in the grey table

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P1	Q1	Q2	Q3	Q4
I want to explore the game's environment	X			
The game allows for enough exploration opportunities	X	X	X	X
I am curious to see how the story will develop	X			X
The characters amuses me	X	X	X	X
The game does not give me the desire to complete/win it	X			
I like the way the story is revealed		X	X	X
Earning achievements is boring		X		X
I want to complete/ win this game		X	X	X
I just want this game to be over		X	X	X
I find the story compelling and well told				X
There are too many achievements				X

P2	Q1	Q2	Q3	Q4
I want to solve the game's challenges	X			
The characters amuses me	X	X	X	
I want to kill all/some of the characters	X	X	X	
I want to become stronger in this game	X	X	X	
I want to continue so I can earn more achievements		X	X	
I like the amount of achievements		X		
I want to complete/win this game		X	X	
I want to progress in this game		X	X	
I am curious to see how the story will develop			X	
I like the created achievements and their design			X	
I just want this game to be over				X

P3	Q1	Q2	Q3	Q4
I want to solve the game's challenges	X	X	X	X
I want to explore the game's environment	X	X	X	X
The game allows for enough exploration opportunities	X	X	X	
I find the story compelling and well told	X	X	X	X
I am curious to see how the story will develop	X	X	X	X
I like the way the story is revealed	X	X	X	X
I would like to see more to the characters	X	X	X	
The characters amuses me	X	X	X	X
I want to continue so I can earn more achievements	X	X	X	X
I like the amount of achievements	X	X	X	
I like the created achievements and their design	X	X	X	X
I want to complete/ win this game	X	X	X	X

	Q1	Q2	Q3	Q4
I want to progress in this game	X	X	X	X
I want to become stronger in this game	X	X	X	X
There is not enough to explore				X

P4	Q1	Q2	Q3	Q4
I want to solve the game's challenges	X	X	X	X
The game allows for enough exploration opportunities	X			X
I find the story compelling and well told	X	X	X	X
I am curious to see how the story will develop	X	X	X	X
I like the way the story is revealed	X	X	X	X
The characters amuses me	X			
I want to continue so I can earn more achievements	X	X		X

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I like the amount of achievements	X	X		X
I like the created achievements and their design	X	X	X	
I want to complete/win this game	X	X	X	X
I want to progress in this game		X	X	

Table 19 This table shows participants felt 'Affect' in relation to the 'Activities', and their positive and negative comments about them

Participant number	P1	P2	P3	P4
'Affect'	Satisfying, Empathic	Fun	Fun, Enjoyment, Satisfying, (positive)-tension	Fun, Enjoyment, Satisfying, (positive)-tension
Positive comments about 'Activities'	Exploring was pretty fun and movement was pretty easy too. i liked the character interactions and looking for gold	I liked the brother's humor and upgrades with each achievement.	I like moving around in the dam finding the challenges, shooting at bubbles, the fish created some (positive tensions), fine variation including the illusion objects/ships. Fine number of achievements, good quests, fine elaborating story	I liked the mission and the way the boat was moving. The story was good and not to predict, which is fine.
Negative comments about 'Activities'	I cannot and will never be able to deal with underwater creatures and 'unknown' phenomena like the weird spaceships. The spaceships were unnerving, the creatures were terrifying! Achievements were kind of a non-issue for me, I don't really like achievements.	The massive fish spread and the ultra-slow speed without boost.	None	None

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Table 20 This table presents how challenging a game was perceived to be if controls were easy/intuitive, how important it is that the game give a 'serious' challenge to players and what comments participants had on the controls if any

Participant number	P1	P2	P3	P4
Comment if controls were perceived to be broken/challenging	None	None	None	None
If controls were perfect, how much challenge does the game provide 1 = really easy, 10 = really hard	4	5	5	5
How important is it that the game should provide a serious challenge for a player	3	5	7	6

Table 21 Comments on the 'Sensing' in the game

Participant number	P1	P2	P3	P4
The visual environment overall	a little too vast and empty but once at the ruins pretty nice	Looked fine, but the blue screen got weird	Fine	Good
The visual feedback	they were lacking a bit	Good reload bar. Could use a speed recharge bar as well	Fine visually presented clues	Good
Character's appearance	Nice ship. NO TO THE FISH, NEVER AGAIN	Looked fine	Nice little submarine	Fine
Other comments on the visuals	Please don't make fish again. The images for the Achievements were fun tho	None	Nasty fish, fine statue, and ships, fine shooting visuals	None

Table 22 Comments in regards to improvements in the games as related to presented topics

P1	P2	P3	P4
The story and characters were good, though perhaps not elaborate with the presented story, but it has the opportunity to be elaborate.	A tooltip on how to get the different achievements.	A little confusing at start (whose brother?) could be clearer with the remark mum says hi, at the start.	None
The environment was mostly really empty, but the ruins were interesting and the weird field of trees and the cows [*i.e. more content*		More fun with bursting bubbles	

needed to be added to the environment]			
The Opponents were way too fast and hard to kill		more fun with exploding fish	
The upgrade didn't really feel like they were doing much because I didn't have anything prior to compare it to. I just clicked and assumed they actually worked.			

6.3.4.1 Discussion of results

This game was targeting the 'Achievement' player type. The scores for this type were shown to a lower facto for P1, P2 and P4 with a score of 13, 31 and 2% respectively. P3 scored the highest with 83% which was the highest ranked type for this participant As such the results were expected to show a low to medium engagement from participants P1, P2, and P4, while P3 should have a very high engagement. This was not entirely the case. While P1 did show a low to medium engagement, and P2 had a medium engagement, P4, which should have had a low engagement, had a very high engagement in the game. P3 had as expected a very high engagement in the game.

For the 'Relatedness' component this received a medium to high rating, with the person most related to this game type (P3) also rating the highest in this game. As such it would appear that in accordance with the design the 'Relatedness' was correctly implemented.

The curiosity results support the previous results of being strongly correlated with the CoDe for this participant group.

As with the previously shown results from the 'Action' game and 'Mastery' game, competence does not appear to have a clear correlation with perceived control difficulty across participants.

The controls for this game was mostly perceived as being easy to intuitive, which suggests that either more experience with the game could give a higher rating of intuitive controls, than what was given, or the controls may not need much more adjustment in order to be perceived wholly intuitive by this group of participants. Not much else can be stated in this regards as there was no other information revealed in relation to these controls, and that the only thing which can further be related to this was a comment on making a visual marker for how much boost time a player had left.

The 'Autonomy' component in this game seems to follow the perspective of not correlating entirely with CoDe across participants. The results of noticing time passing, flow and absorption appear to not have a large correlation with P2 for this game, although the other participants still correlated the same as before.

6.3.5 Immersion game – 'The cursed land'
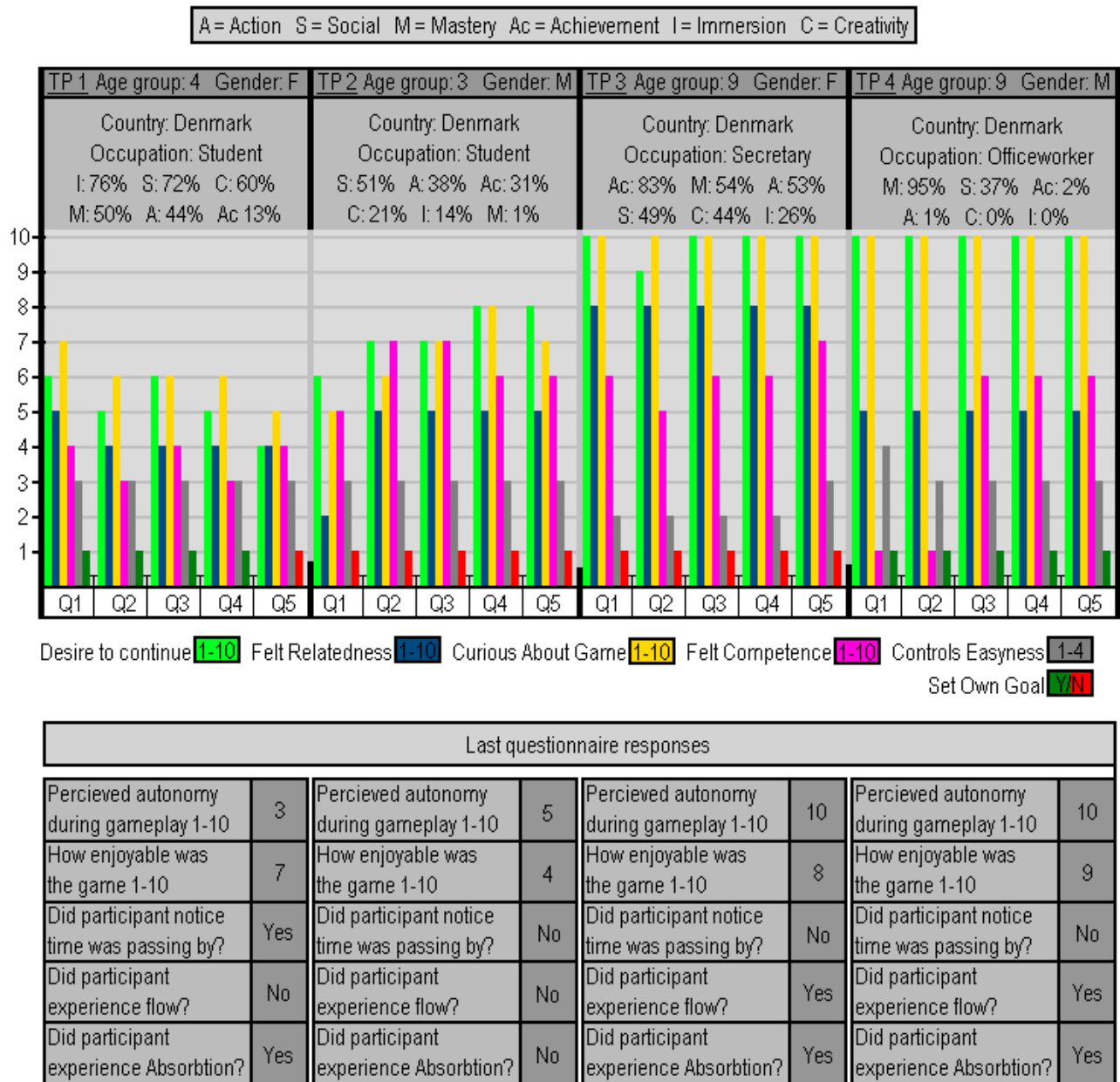
Figur 115 The figure shows the results from the RQ2, except for the answers to why a participant had the continuation desire level as they had, and also features some results from the LQ3 in the grey table

P1	Q1	Q2	Q3	Q4	Q5
I find the story compelling and well told	X				
I am curious to see how the story will develop	X	X	X	X	X
I like the way the story is revealed	X				
I would like to see more to the characters	X				
The characters amuses me	X				
I want to complete/win this game	X	X	X	X	X
I do not like the challenges provided in this game		X			

P2	Q1	Q2	Q3	Q4	Q5
I am curious to see how the story will develop	X		X		
I want to complete/win this game	X	X	X	X	X
I want to solve the game's challenges				X	X

P3	Q1	Q2	Q3	Q4	Q5
I want to solve the game's challenges	X	X	X	X	X
I want to explore the game's environment	X	X	X	X	X
I find the story compelling and well told	X	X	X	X	X
I am curious to see how the story will develop	X	X	X	X	X
I like the way the story is revealed	X	X	X	X	X
The characters amuses me	X	X	X	X	X
I want to complete/win this game	X	X	X	X	X
I would like to see more to the characters		X	X	X	X

P4	Q1	Q2	Q3	Q4	Q5
I want to solve the game's challenges	X	X	X	X	X
I find the story compelling and well told	X	X	X	X	
I like the way the story is revealed	X	X	X	X	X
The characters amuses me	X	X	X	X	
I want to complete/win this game	X	X			X
I am curious to see how the story will develop		X	X	X	X

Table 23 These tables show what a participant marked as their reasons for rating their continuation desire as they did

Table 24 This table shows participants felt 'Affect' in relation to the 'Activities', and their positive and negative comments about them

Participant number	P1	P2	P3	P4
'Affect'	Fun, Satisfying, (positive)-tension	Enjoyment, Boring	Fun, Enjoyment, Satisfying, (positive)-tension	Fun, Enjoyment, Satisfying, (positive)-tension
Positive comments about 'Activities'	Good humor in the beginning, funny, quirky characters. Pretty simple premise at first, but	I liked the glow on the papers, so they couldn't be missed. The story development was	Finding the persons and talk to them. Moving around in the game finding the places and	I liked the story and environment. It´s funny to move around and without any idea off the

	not downright boring either (because it was weird, i think). Interesting enough story reveal in the cursed land, though the introduction of magic and random evil wizard seems a tad meh, but otherwise alright. Liked the village bit more than the cursed land bit.	nice too.	notes. Getting satisfaction in succeeding in these challenges.	outcome.
Negative comments about 'Activities'	The Slender Man monster bit felt... unnecessary. Never saw it 'looming' and only got killed once at random. Area was very very big with a lot of nothing to look at and a lot of going back and forth. Didn't realize there were messages at each location so had to backtrack. I'm not fond of horror games to be fair and wasn't a big fan of the tension though others would probably consider it a positive.	None	None	None

Table 25 This table presents how challenging a game was perceived to be if controls were easy/intuitive, how important it is that the game give a 'serious' challenge to players and what comments participants had on the controls if any

Participant number	P1	P2	P3	P4
Comment if controls were perceived to be broken/challenging	None	None	I am not so used to using keys in other games I am playing	None
If controls were perfect, how much challenge does the game provide 1 = really easy, 10 = really hard	2	5	5	5

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How important is it that the game should provide a serious challenge for a player	3	5	5	8

Table 26 Comments on the 'Sensing' in the game

Participant number	P1	P2	P3	P4
The visual environment overall	Too big. Lots of running from spot to spot with nothing to do or look at. Nice enough contrast between the two areas.	Simple but nice	Like the idea, so enhanced the environment would be fine [*it is not entirely clear what the participant means, although it appears that she want to have some enhancements to the visuals, such as the ones she suggests in the below fields*]	Good
The visual feedback	Good enough for the items. Not much else in terms of feedback.	Great. Could use a little glow or something on the scepter, but only after finding the paper mentioning its whereabouts	More visual hints and longer visibility [*needed*]	Good
Character's appearance	Oddly liked it. Not entirely sure why.	Nice and diverse	Very funny. Of course more seriousness with real persons. [*Participant is arguing that the characters in the game should look like real persons in order to make the game more serious*]	Good
Other comments on the visuals	I mean it was basic Unity looking [*participant is referring to the game engine used*], but it was alright. Darkness was a little annoying to work with. Good contrast of places	None	Floating cows better performed. Wizard [*would be*] more interesting if he could change shape.	None

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P1	P2	P3	P4
Pretty decent story, I'm still missing some details though. Like 'why'.	None	Cursed land could be better with forest and some spooky creatures, which have to be eliminated, with different weapons (not too many though)	None
Too much running around		[*In relation to the mediated story it is needed to be clearer when*] Finding out positively that adventurer was the characters father.	
		Give the character a name.	
		Let the eggs disappear more visually. [*I.e. create a visible feedback cue e.g. having them explode or break when destroying them*]	

6.3.5.1 Discussion of results

This game was targeting the 'Immersion' player type. The scores for this type had the same type of division between participants as did the 'Achievement' type, where P1, P2, P3 and P4 had scores of 76, 14, 26 and 0% respectively, with this type to be P1's primary type. As such the results were expected to show a low to medium engagement from participants P2, P3, and P4, while P1 should have a very high engagement. This was not the case. While P1 did show to have the highest engagement level in this game as related to all the other games, the engagement was steady in the medium range. P2 which should have had a low engagement was equally steady in the medium range. P3 and P4 showed a very high engagement in this game even though their player types should have had them in the low to medium range.

The results for 'Relatedness' in this game seem to have the most stable ratings for each of the participants of all of the games. This indicates that whatever feeling of relatedness the game creates, it was successful in containing that level through the entirety of the game. The results furthermore shows that 'Relatedness' was kept in the area around the medium rating. This indicates that although the game was successful enough to create some feeling of 'Relatedness', it was not sufficient in making it to high rankings, not even for P1 who has the highest ranking in this player type. P1's ratings was furthermore lower, in this game targeted her type, than in the 'Achievement' targeted game. As such the design for 'Relatedness' for this game should be altered as to target the 'Immersion' type better.

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The curiosity rated by the participants is still in correlation with the rated CoDe.

The continuation of perceived 'Competence' in relation to game controls still lacks a clear correlation for this game.

The results relating to the controls of this game were almost uniformly that they were easy. P3 however, had a bit of difficulty with the controls in the beginning, but ended up with enough experience with them that she could rate them easy as well. As such there is not much which can be stated in regards to this, as there is not enough information as to suggest alterations to the controls as to have them appear intuitive to this participant group.

The results of noticing time passing, flow and absorption still appears to not have a large correlation with P2 for this game, although the other participants still correlated the same as before. Since this has become a pattern for P2, it might be argued that he may be an outlier in relation to this, or did not fully understand the questionnaire. The results for P2 in relation to this are the same in the following game's results.

6.3.6 Creativity game – 'Simulation explorer'
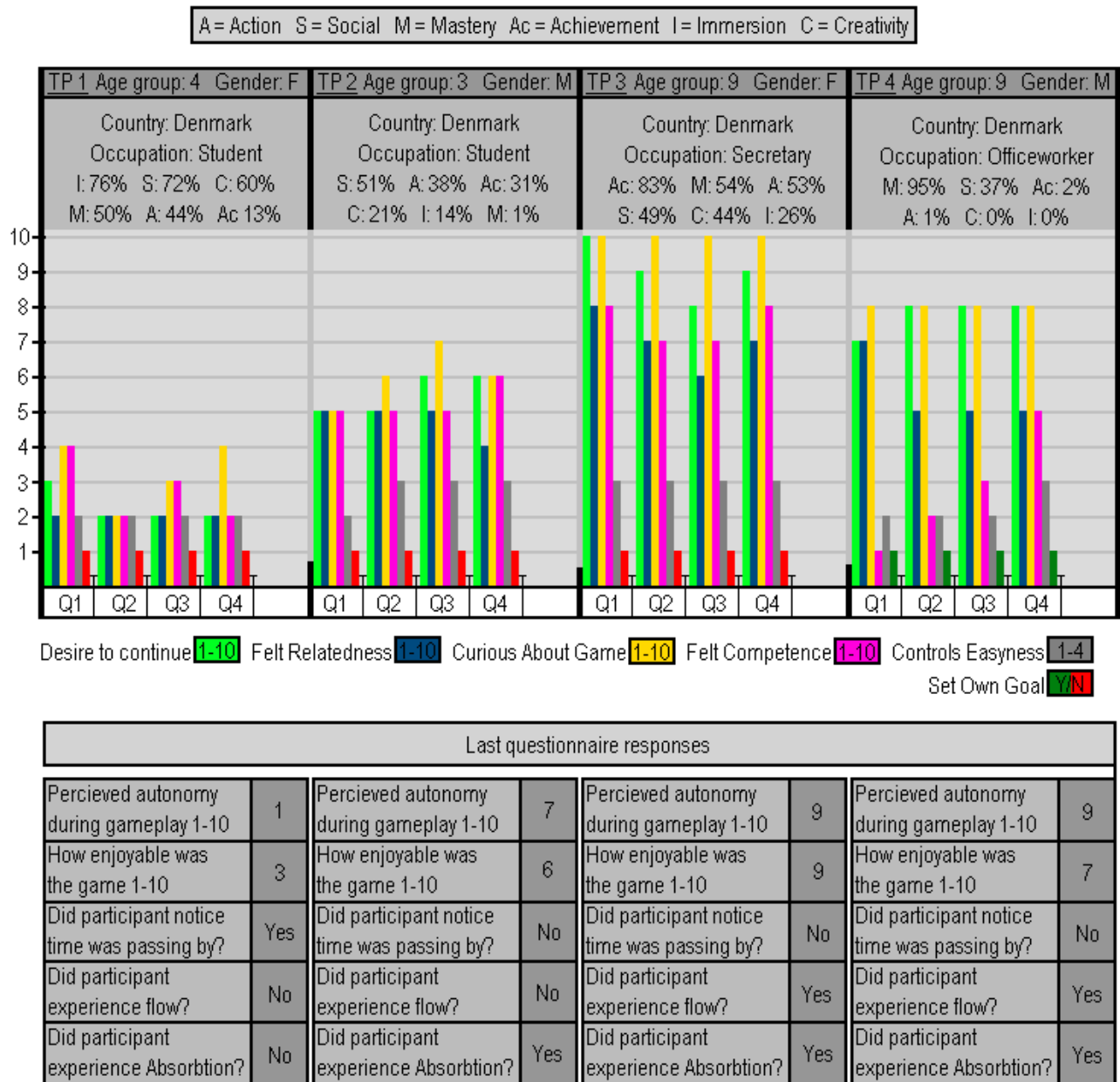
Figur 116 The figure shows the results from the RQ2, except for the answers to why a participant had the continuation desire level as they had, and also features some results from the LQ3 in the grey table

P1	Q1	Q2	Q3	Q4
I do not like the challenges provided in this game	X	X	X	
The story is boring	X			X
I find the characters boring	X	X	X	X
The game does not give me the desire to complete/win it	X	X	X	X
I don't like to run around and locate objects	X	X		
I don't like the building aspect in this game	X	X	X	X
I want to solve the game's challenges				X

P2	Q1	Q2	Q3	Q4
I just want this game to be over	X	X	X	X
The game allows for enough exploration opportunities		X	X	

P3	Q1	Q2	Q3	Q4
I want to solve the game's challenges	X	X	X	X
I want to explore the game's environment	X	X	X	X
The game allows for enough exploration opportunities	X	X	X	X
There are things I want to experiment with in the game	X	X	X	X
I find the story compelling and well told	X	X	X	X
I am curious to see how the story will develop	X	X	X	X
I like the way the story is revealed	X	X	X	X
I would like to see more to the characters	X	X	X	X
The characters amuses me	X	X	X	X
I want to complete/win this game	X	X	X	X
I just want this game to be over	X		X	X
I like the way I can set my mark in this game	X	X	X	X
I enjoy construction in this game	X	X	X	X

P4	Q1	Q2	Q3	Q4
I want to solve the game's challenges	X	X	X	
I am curious to see how the story will develop	X	X	X	X
I want to complete/win this game	X		X	X
I like the way I can set my mark in this game	X		X	
I like the way the story is revealed		X	X	X
I enjoy construction in this game	X			
I find the story compelling and well told				X

Table 28 These tables show what a participant marked as their reasons for rating their continuation desire as they did

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Participant number	P1	P2	P3	P4
'Affect'	Annoying, Meaningless	Enjoyment, Boring	Fun, Enjoyment, Satisfying	Fun, Enjoyment, Satisfying, (positive)-tension
Positive comments about 'Activities'	Once it was a little more obvious, the concept of escaping could be interesting. It just felt a little meaningless here because I'd just end up back in the labyrinth. No real escape. Steve was kind of a prick but it was alright, a bit one dimensional but alright	The freedom to build things as you please is nice	Fine idea with the [*blue*] ray to follow to find the chests. Having to find what you need to get on. To be able to move objects to build what you need.	I liked the challenge when moving around
Negative comments about 'Activities'	The building made everything very difficult. I did not enjoy having to look for these blueprints because the movement wasn't great and the environment was bland. Dunno how you'd expect people to find the way out of the labyrinth without the hint in the main menu, that is a lot of walking in same corridors.	The mission to go high was annoying. The building is slightly glitchy, so going that high was not great.	However, would be better if mouse could be used move objects.	The maze were a bit too long at the last part off the game.

Table 30 This table presents how challenging a game was perceived to be if controls were easy/intuitive, how important it is that the game give a 'serious' challenge to players and what comments participants had on the controls if any

Participant number	P1	P2	P3	P4
Comment if controls were perceived to be broken/challenging	They're not broken, but neither are they easy or fun. Too many buttons to remember, and movement is not really fun.	So many shortcuts to remember [*the participant is referring to the building controls*]	None	Too much information. I think. [*the participant is referring to the building controls*]
If controls were perfect, how much	4	5	5	5

challenge does the game provide 1 = really easy, 10 = really hard				
How important is it that the game should provide a serious challenge for a player	6	4	5	6

Table 31 Comments on the 'Sensing' in the game

Participant number	P1	P2	P3	P4
The visual environment overall	Bland, extremely cluttered, very very big bushes	Simple but nice	Fine environment	Very good
The visual feedback	Very limited. Cross didn't give any real indication something could be selected it seems [*this is a misunderstanding on the participants side, as the cross was never meant to select anything*]. Cross also tended to disappear.	Good building pointer	Put a marker on all chosen objects also e.g. the boxes chosen	Good
Character's appearance	It was a white ball?	Just a white ball. Indifferent.	Fine, could be enhanced by being more human like.	Funny
Other comments on the visuals	Movement problems and extreme clutter made the motivation to explore disappear. [*With "clutter" the participant is most likely referring to the amount of bushes in the game*]	None	Water color and ability to go through walls [*was*] not good. [*With the walls the participant is referring to the labyrinth where she sometimes went through the wall even though they had colliders*] Nice rocks, landscape, [*and*] greenery	None

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Table 32 Comments in regards to improvements in the games as related to presented topics

| P1	P2	P3	P4
The story and characters felt kind of meaningless. Interesting story idea tho, just lacked impact. [*I.e. make the story more elaborate*]	None	Good building features however prefer moving objects with mouse	None
The idea of escaping is neat but I could never actually escape? [*I.e. make escaping possible*]		Marking on building objects was not always visible	
Not really a diverse environment either. [*I.e. make environment more diverse*]		Maybe developing/commenting somewhat in storytelling [*I.e. make the story more elaborate*]	
Building was problematic. If it had been fun/intuitive it might have been better. Was mostly just frustrating.			

6.3.6.1 Discussion of results

This game was targeting the 'Creativity' player type. The scores for this type for P1, P2, P3 and P4 were 60, 21, 44 and 0% respectively. As such the results were expected to show a medium to high engagement from participants P1, P2, and P3, while P4 should have a very low engagement. This was not shown to be the case. P1 had a low engagement for this game, while P2 had the predicted medium engagement. P3 on the other had had a very high engagement level for this game, and P4 was also shown to have a high engagement level for this games. As 'Relatedness' did not seem to be of great importance to the 'Creativity' type, the results of low to medium feelings of relatedness by the participants were expected. However, P1 who had the highest ranking in this type (although it is takes the third ranking place) had the lowest scores for 'Relatedness', and as such I will argue that this game should be altered as to feature a design taking this more adequately into account. Again the curiosity relates well with the CoDe for this group of participants. As such I will argue that it appears that this component seems to be very important in creating CoDe for players. As such, when designing any game, for any type, developers should seriously consider how to create curiosity for their players. Again the perceived 'Competence' component does not appear to have any cross correlation with how difficult the controls appeared to be. These results are in direct conflict with the research in relation to the SDT, where perceived competence was found to be important as in relation to how difficult the controls were perceived to be. As such I will argue that the questionnaire formulation may have given the participants the wrong idea about what 'Competence' means in this regards. If this should prove to not be the case however, I will argue that the participants for this project may be outliers as opposed to the general gaming population. In any regards not much can be concluded with only four data sets where there does not seem to be much correlation in this regard.

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The controls for this game were showed to be both challenging and easy. The challenging part of the game was mostly in relation to the building feature, where the participants had to keep track on several different mechanism in relation to this. As of such, I will argue that including the mouse more in how to manipulate an object could help in making the controls easier, but in terms of the amount of ways a single object could be manipulated; it would have been far more effective to use UNITY's UI system (Figur 103). Here UI buttons on the screen could have been easily related with how the object could be manipulated, such as having arrows pointing up and down as to relate to the feature of moving an object up and down. The use of such an implementation is nothing new, as it has been used in commercial games such as Zoo tycoon (Blue Fang Games, 2001) as seen in the picture (Figur 117).
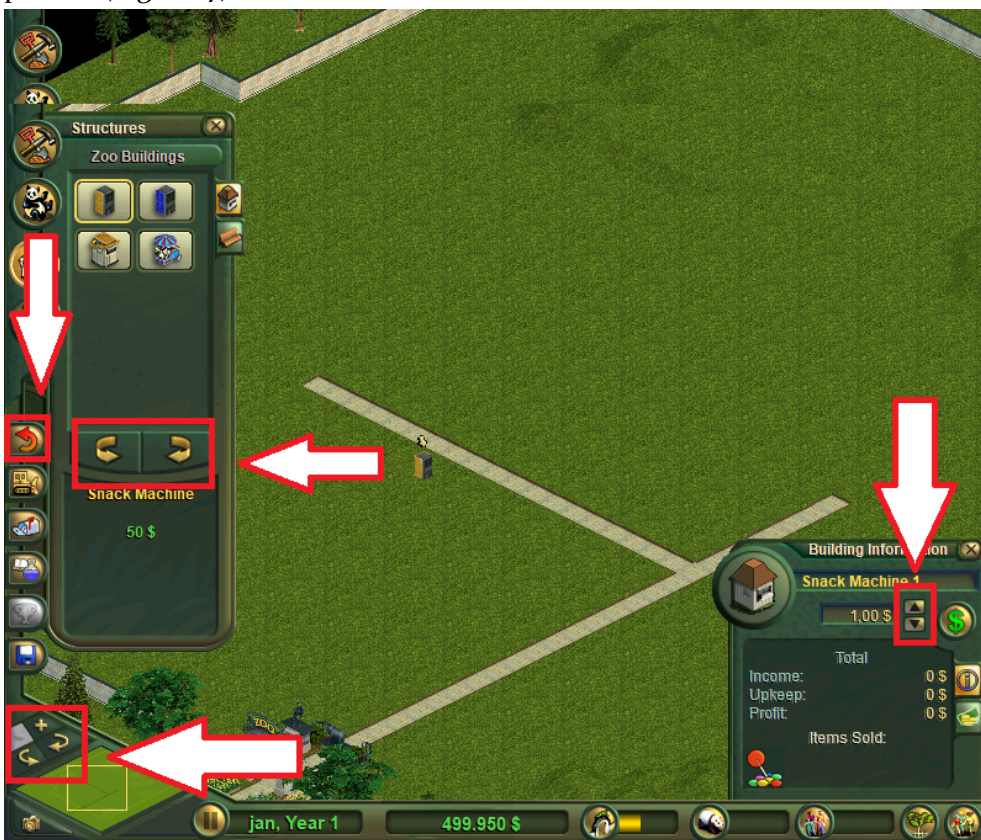
Figur 117 A screenshot from where the arrows point towards more intuitive mechanisms of movement and actions

But in relation to the controls P1 stated that it was not fun to move around. She however did not specify why this was. As such I have no suggestion as to make movement 'fun'.

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6.3.7 The evaluation questionnaire results

As such the last questionnaire, the EQ4 will now be presented.

Participant number	P1	P2	P3	P4
Participant was mostly intrinsic motivated	No	Yes	No	Yes
Most enjoyable game	Immersion	Creativity	Creativity	Immersion
Least enjoyable game	Achievement	Immersion	Mastery	Action
Which game would the participant like to play again	Social	Mastery	Creativity	Mastery
Participants perception of the intrusiveness of the test method where 1 = not intrusive at all, 10 = extremely intrusive	4	7	4	2
Participants perception of how annoying the test method was where 1 = not annoying at all, 10 = extremely annoying	3	5	4	3
Other comments on the test method	The only time the questionnaires got annoying really was in the end of cursed land, where there was one every time something remotely big happened which was honestly interrupting the experience. Otherwise it wasn't really that troublesome.	None	None	None
(Continued)	Some of the 'mark these boxes' in the first page of questionnaire felt a little lacking around exploration, because i love exploration but the games didn't motivate a lot of exploration which wasn't something i could really pick.	None	None	None

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6.3.7.1 Discussion of results

The results presented in the above Table 33 shows that P1 and P3 was mostly extrinsic motivated during gameplay, and P2 and P4 was mostly intrinsically motivated. How this relates to each game is not known, but the results show that the test was sufficiently subtitle enough to not have all respondents' state that they were mostly extrinsically motivated.

For the results on most/least enjoyed game and what a participant would like again, there were a few surprises.

However, the most unsurprising result was P1. Her results showed that she enjoyed the game the most which had been targeting her highest ranked player type preference (Immersion), and had least enjoyment at the game which targeted the player type she was the least preferential towards (Achievement). It was furthermore unsurprising that she chose the 'Social' game as the one she wanted to play again, as this game was targeted her secondary ranked player type preference. The reason why it is unsurprising that she did not chose the 'Immersion' game over the 'Social' one even though she found the 'Immersion' more enjoyable, is the simple fact that there are not much replayability in that game. It was given a linear story to complete, and after this, the game holds nothing much else of interest. Here the 'Social' game at least allows for improvement in competence levels and the enjoyment of playing with another person.

P2 had a few surprises. Although his primary player type was determined as 'Social' he did not feature this game at all in the EQ4 responses. Instead, the game he enjoyed the most was the 'Creativity' game, which was the fourth ranking type. He stated, verbally, that one of the reasons for this was the (defective) cows, which he perceived as creating great enjoyment for him. Unsurprisingly though, the least enjoyed game was the 'Immersion' game, which was the second lowest ranking on his type list. This makes sense as there is not much interaction beyond reading already constructed dialogue, which means that any form of social interaction that could have been mediated by the game was not available. It was however, surprising that the 'Mastery' game was chosen as a game P2 would like to play again, in relation to that this game was targeted the type he had ranked the lowest of all six. The reason for this was apparently that he lost the game, but would like to have a rematch as to win it. I will argue here, that the easiness of the controls and gameplay of the 'Mastery' game, may be why P2 perceived that he would not have to put in a large effort as to win the game, which was, verbally, stated by him as a reason to why he dislikes 'Mastery' games.

P3 had the most ambiguous answers for the EQ4. She enjoyed the 'Creativity' game the most as she found it enjoyable to run around and look for collectable items (verbally stated by P3 and observed by me during the gameplay session). Hence, it would seem that the reason why she enjoyed this game was the feature which could also be related to the 'Achievement' type that was her highest ranking one. But she also stated that she liked to explore the game, which is a feature in relation to her lowest ranked type. As such P3 seems to be all over the place in terms of what she relates to as enjoyable game experiences. It was furthermore surprising that the rated the 'Mastery' game as the least enjoyable as this type is the secondary ranked by her. It was however, verbally stated, that it did

not feature enough challenge, in relation to why this game was chosen for this position. The game chosen as being the one P3 would like to play again correlated with the one she found the most enjoyable. This is not surprising as to the correlation of stated enjoyment. P3 also stated that this game had her mostly intrinsic motivated as opposed to the other games, which could imply that the reason for her not choosing the 'Achievement' game as the most enjoyable was that this game was not able to create a high intrinsic motivation. The reason for this game failing to accomplish this could be implied to have its root cause in the 'Autonomy' component of the SDT. Where the 'Creativity' game allowed for a high 'Autonomy' level, the 'Achievement' game could be theorized to impair the feeling of autonomy as the player is continuously directed and corrected by an in-game character (the brother).

P4 offered the surprise of choosing the 'Immersion' game as the most enjoyable one, even though this type had the score of 0% in the rankings, but unsurprisingly he chose the 'Mastery' game as the one he would like to play again. For the least enjoyable game the 'Action' game was chosen, which correlates well with it being one of the lowest ranked of his types (1%) and the game that was perceived to be hard to play by all participants. The reason for the 'Immersion' game to be chosen as the most enjoyable one, can be related to what he verbally stated during the play session. P4 took great humor in what was perceived by him to be and absurd story of the game and the ridiculous nature of the main character. As such he continuously laughed at the in-game dialogue presented before the main character traveled beyond the wall (Figur 83), and correspondently found the text presented in the notes as humorous.

In regards to intrusiveness it was shown that the participant rating this the highest was P2. It was stated verbally by P2 that the method of having a questionnaire suddenly popping up on a white background was a bit of a shock element for him, which is why he rated intrusiveness 7. The other participants rated the intrusiveness in the lower end of the scale with P1 and P3 rating it 4, and P4 rating it 2. As of this it can be discussed as to how the questionnaires is activated, where a verbally suggestion from P2 was to have a sound warning players that a questionnaire is about to be activated. In relation to how the questionnaires were implemented, this could be reformed such as when a participant reaches a point in which a questionnaire is about to be presented the game would first pause itself, and perhaps a discrete visual countdown to when the questionnaire will be activated could be shown. As such there would most likely be created annoyance in players when the game suddenly pauses itself, but in regards to this happening in any case, this adaptation may provide a better alternative as to what was implemented.

For annoyment perceived by the participants, these ratings were in the lower end of the scale where P2 again rated the highest with a score of 5. P1 furthermore commented that the questionnaires became most annoying in the 'Immersion' game as to how quickly they were presented. As such I am inclined to agree, as the second last questionnaire and the last questionnaire in this game was implemented to be activated at the beginning of a conversation, and in the end of it. As such I will argue that the second last questionnaire (an RQ2) should be omitted, but whether or not the last questionnaire (the LQ3) should remain the same place, or be presented in the place where the RQ2

is currently at is a decision which can be discussed, as I see no clear answer to where it should be presented.

There were no other comments on the test method beyond P3 and P4 verbally stating that this type of method is a natural match for testing games, which can be discussed. The overall results for the EQ4 were that the test method was somewhat successful as to not be intrusive and very annoying for the participants.

6.4 Discussion of the participants

Although not originally intending to discuss the participants in relation to their combined results, the above presented data presented a need to do. As this is in relation with the results collected and not as much a discussion of the test method, I will present this discussion here before proceeding with the regular 'Discussion' chapter presented next. For this discussion I want to relate to the participants' ages and their experience with games.

Participants P1 and P2 were in the lower age category, and are known to be in average playing group 2 and 3 respectively. As I know all participants personally I also know that their playing time is most likely in the high end of their group, and that they are playing many diverse types of games. As such, they have a vast experience with different high quality games, which means that when they play a game that was roughly created in two weeks, this should naturally lead to a high level of criticism as they have many other games which they can relate the said game. As such their results in relation to criticism of the games are pretty much in line with this, and their engagement was equally not that high. The aspect of these participants' age can also be related to this. As already written about in the 'Analysis' chapter (2.2.2.2 What to take away from the source), age and differences in game preferences pretty much seems to start high and then go down as people age. As such, these two participants who were in the age groups of 4 and 3 respectively could also be expected to have a more distinct difference in their results as related to the game type. This was also the case as their results from game to game varied a great deal.

In the opposite of this were P3 and P4. Both were in age group 9, and in group 1 for average amount of playing time a week. Both of these participants are equally persons I personally know, and as such I also know that they have not much experience with various computer games, where it is normally P3 who engages in computer game activities, with a preference for games such as (Sid Meyer's Civilization II, 1996) and more recently the casual games of the type where a player need to match three tiles to make them disappear (an example of this type is (Candy Crush Saga, 2012)). As such it could be expected that their criticism of the games would be very low as they had not many games to reference from, but where it was equally expected that P3 most likely would be more prone to add criticism due to the (although limited) experience with computer games. Their engagement levels in the games are equally supported by the age group where there should be less division between the different player types. As their previous experience with computer games was low, and they are in

the age group of less diversity in relation to preferred type of games, this explains why they had such high engagement levels through all the presented games.

As such I have to conclude upon this that the inclusion of age groups and average playing time per week proved to be an important part of the questionnaire design as this can be used to explain some of the results presented in the above chapter. Furthermore, although the future might render different results in age differences and player type engagement, as of now, this seems to be important to include when testing video games.

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7 Discussion

After going through the evaluation of the test and the results, this chapter will discuss the questionnaires as in terms of what could be improved, added and altered. Hereafter the product will be discussed as in terms of what could be changed, before proceeding to the conclusion of this report.

7.1 Discussion about the questionnaire(s)

In this subsection the questionnaires which was designed and used will be discussed, where things such as questionnaire formulations, amount of data collected and omissions will be looked at.

7.1.1 Questionnaire formulation

When conducting the test with the three last participants it emerged that some of the formulations used in the questionnaires was either not clear enough, too easy to be misunderstood or dealing with subjects not generally known which caused some confusion for the participants.

7.1.1.1 'Relatedness' confusion

The question about how the 'Relatedness' factor (2.1.2 Self-determination theory in relation to computer games) from the SDT was especially hard to understand for one of the participants, where it was asked about several times. Hence it can be discussed that this term, as was already done with the 'Autonomy', should not be used but a more layman synonym should be found instead. As of now I have no suggestion for which term should substitute 'Relatedness', and I will argue that suggested synonyms should be tested rigorously to make sure that the new formulation is understood correctly. It may even be that instead of a single synonymous word, 'Relatedness' should be given a statement instead.

7.1.1.2 'Absorption' confusion

Another question which appears to have been misunderstood is the question about absorption (5.1.5 The last questionnaire). The word absorption is a word that can be used on a regular basis e.g. "I was completely absorbed watching a football match" and as such the meaning of the word can already have established a meaning before taking the test. This may normally not be a problem if the participants already knows the meaning of a word, however, in this case where the word 'absorption' is described as being a "mix of immersion, flow and in-game-presence" (5.1.5.2 About the question of absorption and sense of time), the original meaning of the word (in the participants mind) may not add up to the same. When answering "yes" to being absorbed in the game in the LQ3 this would also imply that the participant also have felt flow at least at some point in the game, and it would therefore be expected that the participant would answer "yes" also when asked if they felt the state of flow in the game. However in some of the answers it was stated that a participant did not feel flow in the game, but did feel absorbed. I will argue here, that instead of using absorption in future similar studies, it may be more useful to dig into the enormous subject of immersion, and formulate questions regarding that instead.

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7.1.1.3 Negative statements relating to 'Continuation Desire' turned positive

A statement that participants could select in some of the games were the following "I want to kill all/some of the characters". This statement was originally thought as being a negative, where it should be correlated to a low CoDe in a participant. However, one participant who was very motivated used this statement as a positive instead. This means that the statement is not good enough to be tied in with a low CoDe, and as such it should either be reformulated, or two extra negative statements should be created instead, where the "I want to kill all/some of the characters" will be regarded as a positive instead of a negative. I will argue that the best method here would be to reformulate the statement or make a completely new one, as it is ambiguous and not easily interpreted whether or not a participant regards this particular statement as positive or negative.

In a similar aspect, I will argue that the rest of the statements featured in the product should be revisited, where input from non-project related persons should be asked in regards to what their perception of the statements is. Preferably this would lead to better formulations that would not be ambiguous.

7.1.2 More participant comments

In the questionnaires there are featured several scales, where the participant have not been given the option of commenting on why they chose the score they did. I omitted this idea based on the time limiting factor of this project, but I will argue that more comments should be included if further research using this method is made.

7.1.2.1 Comments about personal goal

One place where comments would have been useful in retrospect is when asked the question whether or not the participant has set a personal goal. Knowing what the goal is could help in interpret the CoDe of a participant, say if they are unable to complete their goal, and this may lead to a drop in their CoDe. Another use of knowing what a self-set goal, if taking the perspective outside of this project, could be that it might provide a game's developer with alternative game features to implement. It may even be argued that if several game testers set the same self-made goal, that it could be featured as one of the games core-mechanics/core-gameplay. As such I argue that asking what the self-set goal(s) is should be used in future similar studies.

I will also argue in relation to this that a short interview with participants after each game should be conducted to pick up factors which may be unaccounted for in designing the questions.

7.1.2.2 Participants' option to comment on broken/challenging controls

In the LQ3s presented to the player one of the questions related to how easy/challenging the controls were perceived to be. Here I only implemented the option of commenting on the controls in the very first RQ2 of every game from the perspective that if the controls were perceived to be broken/challenging the reason for this would persist through the game (e.g. if the player thinks the mouse is jagging too much, this perception should most likely be the same through the game). What I had not considered, however, was the fact that when some of the first RQ2s popped up, it was after the tutorial level, and that the later gameplay might alter the participants perception of controls in a

negative direction, which happened with the Action game (Mercenary). As such I will argue that this should be changed such that the participant can always comment on why controls are challenging, but make it clear to the participant that if they have nothing new to add, then they do not have to repeat themselves throughout the questionnaires (e.g. if the person find the mouse is moving too fast i.e. too sensitive, they only have to state this in the first available questionnaire).

7.1.3 Questionnaire inclusions and omissions

During the creation of the questionnaires some things were omitted, and here it will be discussed if some things should be further included in the questionnaires.

7.1.3.1 Including immersion in the questionnaire

As already stated previously (2.1.2.2.2 What to take away from the source) I did not include a wider range of questions for the participants in regards to immersion. This was done from the perspective that immersion is still currently nowhere near a widely accepted clear definition, and as such the only reference to immersion was when the participants were asked to rate their level of absorption. The point of omitting immersion from the test results should naturally be regarded as a weak-point to the questionnaires created for this project. The inclusion of immersion will however require a much larger scope than this project features, where a clear definition of immersion need to be established as a base ground for creating the questions to be asked the participants.

7.1.3.2 Inclusion of participants' preferred game genre

Another omission from the questionnaires was questions about which game genres the participant usually likes. The main reason for omitting this is the fact that the questionnaire from (Yee, Quantic Foundry: Lab, 2017) determining the player types of the participants was deemed as a sufficient identifier in relation to the player type. But during the test of the first participant it became clear that game genres should have been included, as this person is not a horror-fan to put it lightly, and that she perceived the Achievement game (Submarine adventurer) to be terrifying once she unleashed the fish from their bubble (ref). Up until this point she had enjoyed the game somewhat, but the fish simply scared her too much to finish the game properly, and she had to restart the game. Therefore I will strongly argue that game genre preferences, and which game genres that is strongly disliked, should always be taken into account in order to discover whether or not a participant's drop of motivation is due to elements that are not directly tied in with determining player types. As a side note in retrospect I will also argue that I should have accounted for this earlier, as one of the disengagement features described in CoDe source was specifically stated as a game being "*the wrong genre*" (Schoenau-Fog, 2011a).

7.1.3.3 Time played

In the LQ3s the question "Did you notice time was passing?" was added to give a sense of the level of interest (as related to CoDe, flow, absorption and motivation) from a participant, where one can argue that not noticing time is an indication of higher engagement into the game. Here an additional question could have been asked, namely "How long did you think you have played the game?" which would indicate whether or not a person not only did not notice time, but also lost the sense of it. This additionally question was originally intended to be a part of the LQ3, but when planning the test from the perspective that the participants would play the game in their home and preferably

without contact to me, it became clear that in order for such a question to work, the participant would have to time how when they started playing the game. Here I will argue that when giving the participants this task, it could cause the bias of having them thinking about the timing of the game, hence they will have more focus on time passing, and may not experience the trait of losing the sense of time, which they maybe otherwise would have. However, I will argue that when the participant is testing with a test conductor present, this will allow for the conductor to time the events, hence making the addition of the question possible without the bias I have described, and as such add a valuable result to the data.

7.1.3.4 Initial motivation and intrinsic/extrinsic motivation

A thing that was lacking from the test was to ask how motivated the participants were before beginning the test. This could have been used as an initial reference for the later responses of motivation. Whether or not people should be asked once before beginning the test or once before beginning a game can be discussed. However, since this test proved to take many hours instead of what was expected to be a two hour test, I will argue that in this case the test persons should be asked before each game, since one cannot expect a similar motivational level during several hours.

In the same relation the question which was only featured in the EQ4 about whether or not a participant was mostly intrinsic or extrinsically motivated, this can be argued as both being featured before playing a game and also during a game play session. Here the extra data would help establish if the motivational type of a participant might shift, which could both help in regards to examine the participants CoDe, but also whether a game in itself is enough to create and sustain an intrinsically motivated experience. I wall also argue in hindsight, that looking from a perspective outside this project it is quite crucial for a game's success whether or not it is actually able to make a player intrinsically motivated to play the game. Hence I will recommend that asking to the motivational type of a player in relation to a gameplay session should be done before, during and after the player plays the game.

7.1.4 Other points in regards to the questionnaires

When running through the participants' responses, one of them stood out in relation to how a game could be improved with the help of said responses. This was the final question in the LQ3 which asked participants what could be improved considering the aspects from the secondary motivators as taken from the Quantic Foundry site (Yee, 2017). Here the participants did not make many suggestions on what could improve the game; however the suggestions made were on what could be called the more visible parts of the games, such as putting more content into the environment, make enemies easier to kill or make the story element more elaborated.

This indicates that when play testing a game, it would most likely not render many detail improvement suggestions as a participant is not fully aware of all the aspects a game has to offer, both while playing it and after terminating the play. Hence I will argue that content specific questions, such as the ones presented in my questionnaires will have a much larger possibility on giving the necessary data to improve a game's finer detail.

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A more crucial point in relation to the questionnaires was the 1-10 scale. In almost all of the questions where a participant had to use the scale from 1-10, 1 indicated that something was really bad, whereas 10 indicated that something was really good. However, two of the places where the 1-10 scale was used this had been reversed. Specifically it was the questions in the EQ4 in regards to intrusiveness and annoyance. Here one of the participants were so use to the scale being 1 = bad, 10 = good, that he had reversed the data. This error was only discovered since the participant had verbally stated, when completing the EQ4, that he found the method to be really good, which had his responses rising a red flag upon review for the 'Evaluation' chapter. Consequently the participant was contacted and the results were corrected. However, I will argue that this error should have been avoided by having the meaning of the scales be referential to each other, such that 1 would always be equal to bad/negative, and 10 would always be equal to good/positive. This is naturally not to say that reversed scales should not be used where 1 would be positive and 10 would be negative. I merely indicate that all scales could benefit from the feature of having the same baseline in terms to which numbers correlates with a negative stand and which numbers correlates with a positive stand.

7.2 Alterations to the product created

When creating the product for this project I decided to create six games in an attempt to control the various game elements targeted at different player types. As such I hypothesized that when creating a game with only one player type in mind, the questionnaires should not only be capable of detecting whether or not the game was successful in targeting the player type, but also why it would not suit other player types. Naturally this would also mean that if a game targeted one player type actually can satisfy other player types, this would be revealed by the questionnaires as well. Initially there is nothing wrong with wanting to create a controlled product, but in this case the single fact that people had to play six games across many hours, along with experiencing the bugs/glitches/typos/missing content and not knowing when they would be done with the task is known to have thrown off participants who ended up not completing the test. Additionally, stating that the test would take two hours is most likely also a reason why some possible participants did not engage in the test at all.

The four participants who actually did complete the full test had to do so with my help, and in all cases the test had to be spread out on two days because of limited leisure time for two of the participants, and the other two began testing too late on the day which lead to them having to stop due to being fatigued. As such, I will argue that the test products premise is simply too expensive and complicated for participants to complete the test in one day without any help. In order to create a more suitable product to test there are four other approaches which could have been used instead:

7.2.1 One game instead of six

Firstly, there is the aspect of creating one game, instead of six, which features all the components for the different player types. Naturally it can also be considered to use an already created game which features all the components for the different types, but I will argue that this would perhaps be even harder to control than creating a product specified for the test. The use of one created game would be hard to test without intense control of what the players do in the game in order to distinguish

which features of the game is used and in addition how that feature correlates with a participants player type. Hereby it would be difficult in relation to player type cross-overs where a person who would be perfectly happy with a pure action game might also like extensive exploration or strategy. As such I will argue that the controlling element of such a test will be highly difficult to achieve and the results might not catch all the different aspects of cross-over behavior.

Therefore I will argue that in any instance this is not a method which should be used when one is trying to use player types as a way to figure out whether or not a game successfully targets its intended audience. As a side note, if a game developer is in fact trying to target all available, or just multiple player types with his/hers game, it would still only make sense to use individually created questionnaires that are successful in targeting each of their own player types, where the developer should combine them in an attempt to receive results on all the facets of the different player types. This should allow for a developer to evolve the gameplay in relation to the different player types individually, i.e. if a game has enough destruction mechanisms such that an Action player is perfectly happy with the game, but a Mastery player does not find enough strategy elements, then the developer can create more strategy features in the game, but knows that he/she should leave the destruction element alone.

7.2.2 One player, one game
A second method would be to still create all six games, but only let a test participant play the one which correlates with their predicted player type from the Quantic Foundry website. This could be a much better choice as to figure out whether the test and the questionnaire actually fits well enough to measure a games success in creating CoDe based on player types. This would also create a much shorter test where people could have been more inclined to test and one where they would not be as likely to experience fatigue during the testing.

However, if this test method was used instead, it would eliminate the possibility of discovering how accurate the framework would be in predicting a games success with other player types, where the results may show that a game intended for e.g. the Social player type would also suit e.g. the Mastery player type. Or, in relation to that, the results may even show that a game intended for the Social player does not work at all for type, whereas it could be a success for Mastery types. As such I will argue that this is not the way to go either.

7.2.3 Plan to spread the test out on multiple days
A third optional method would be to keep the six games as is, and then spread the test across six different days, where a person would play a new game each day. This method should hopefully prevent player fatigue, but here it would then be crucial to gather data on a participant's motivational level before they enter the test each day, as it would be expected that the events during the day should have an impact on one's motivation. I will also argue that keeping a participant interested in completing a test that takes several days may also be difficult as some, most likely most people, are not willingly giving up that much of their leisure time, while they also have plans and other persons/things that needs their attention. I would therefore not argue that the test should

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have been performed in such a way unless it was known beforehand that people had already reported that they are willing to participate in such an extensive test period.

7.2.4 Cutting content

A fourth way the test could be altered, would be to cut the games, gameplay and game features heavily down such that each game would at a maximum, including questionnaire completion time, take 15 minutes each, and that there should only be featured three questionnaires (2 x RQ2 + 1 LQ3) in each of the games. This is not to say, however, that a test game should only include three questionnaires at all times, but for this test, and the shortened games, this would hopefully ensure that people were more likely to test the games and complete the entire test.

In relation to cutting down the content of the games, the first natural choice would be to create much smaller environments for all of the games, such that the distance between gameplay features and objects would not require much time when moving from A to B. This would most likely mean that player types liking the exploration elements might not be satisfied with a limited environment to explore, but the games are not meant to be perfect, and the questionnaires are constructed such that it should also pick up the negative aspects of a player's relation to the game, which is part of the whole testing idea.

For the in-game feature, it would be different as to what and how much to cut from the different games. It would for instance be obvious that the amount of enemies in the Action game (Mercenary) should be cut from 271, that there should be fewer of them in each group and that their movement should be severely improved as they were far too hard to kill with the guns, leaving only the boom boxes (Figur 30) and the shield (Figur 31) as effective weapons. For the Achievement game (Submarine adventurer) however, the amount of enemies (i.e. the fish from Figur 70) should not be decreased as the player would then have to look longer for an encounter with one of them. However, the amount of bubbles and cities (Figur 66) could be decreased, and the sonar (Figur 77) could have been activated from the very beginning to help the player locate items.

Furthermore, the games should feature a guide for the more elaborate/complicated aspects of the games, where people would be able to see where the questionnaires would turn up. More elaborated hints should be featured, which should lead the participants onto what is expected of them in regards to the gameplay. As an example of this, a guide for the Creativity game (Simulation Explorer) could feature a hint stating that the player should not follow the explicit advice of the in-game character 'Steve' (5.2.6.1.4 The design choices), and are expected to try and break the rules/game.

I would argue that this fourth method would be the best way to alter the product to test for a more successful outcome.

7.2.5 Game guides

Another thing which could be alternated, which i will discuss here, is the written descriptions in the games, which are meant to help the participants figure out how to play the game.

Firstly, if everything was being remade, I would use the UI feature (Figur 103) in (UNITY, 2017) instead of the GUI feature (5.1 Designing and implementing the non-specific part of the questionnaire). This is due to the fact that when using the GUI, the buttons and boxes has a semitransparent background, which makes it hard to read what is written inside them if visible parts of the game behind the GUI is either very bright or of a complex nature (e.g. a bush with many different colors and leaves or there simply is many different objects featured at the same time). The GUI feature in UNITY does offer the opportunity to customize how the GUI should appear on screen, but using the new UI system is easier than creating a custom GUI and there is also the aspect that in the future UNITY will no longer update the GUI, as they want people to shift to the new UI.

The new UI system also has the additional feature that the text can scale with the screen size/resolution, which means that one does not have to worry whether or not all the text will actually appear and be readable to a player. A downside, however, to the UI is that if an image is being used, and the UI element is attached to the player's viewport camera, then other objects in the scene may 'go through' the image if they are too close to the UI element. I.e. if you consider your eyes to be the viewport camera in the real world, then a paper plastered over your eyes would be the UI image, which means that anything else around you could have an impact on that paper if something got close enough. This is not a problem when using GUI, as these elements is always put in front at the screen, where no object can interfere with them.

Beyond the visibility of the written descriptions, there is naturally also the content of the text featured. As already stated in the 6 Evaluation there were problems with understanding the descriptions, and as such there are two solutions I will argue could help this problem be diminished.

The first is of cause to change the descriptions to make them easier to understand for a wider audience, as some of the misunderstandings apparently stemmed from lack of knowledge about specific terms, or how the narrative around the descriptions was constructed (e.g. the guide in the beginning of the Achievement game (Submarine adventurer) had a narrative surrounding the description of how the controls works, where the idea was to correlate the 'real controls' from the in-game world with the actual keyboard and mouse controls). The changes to the descriptions should be made with the help of people who knows nothing about the games and their content in order to test whether or not the descriptions are clear enough for outsider to understand them. Preferably there should be several different outsiders used for this process who are from different backgrounds, who also have different perspectives than the person writing the initial game descriptions.

The second solution to the misunderstandings and misreading is twofold. The first aspect is that the information that needs to be presented to the player should be kept at a moderate amount and pace of introduction. This should allow for the descriptions to be more digestible for people, which hopefully would render less strain on their cognitive abilities and thereby make it easier to focus on what is actually written, rather than a player skimming over the text in order to proceed in the game faster. By this standard the tutorial levels might need to be stretched further out to take up a longer time of the gameplay, but if this helps a participant better understand how to play the game, they

should also be able to complete it faster, and hopefully the extra time spent in the tutorial will decrease the amount of time from playing the rest of the game. The second aspect is to provide a re-reading of what has already been presented, such that people can go back and receive the information again should they have skipped, or misunderstood some of the presented features in the description.

7.3 Successes of the test method

One of the most successful aspects of this method is in relation to the questionnaires created. Here the CoDe element 'Curiosity' from the aspect of 'activities' was used in the RQ2s as to see how it evolved over the course of the playtime. The element seemed to have a very close relation to the participants' CoDe, which can therefore be argued to be an important part to test for when a game is tested.

A second aspect was in relation to the participants' age. Here the research about gamers' motivations as they age could be used to explain the reported CoDe as rated by the participants. However in this relation it has to be noted that it was only due to personal knowledge that the results could be further explained, and as such I will argue that the experience of a participants (as to what they normally play and what they have tried) would be needed in relation to this.

7.4 Discussion of the framework

The framework created for this project proved to propose a somewhat successful approached as to how to test games, however with only four participants this cannot in any ways be regarded as definitive proof. But in relation to this I will argue that the creation of the questionnaires in the 'Design and implementation' chapter shed light on the aspect of including which data should be gathered in the framework. As such I will state that the framework needs to evolve into including this, such that people who want to apply the framework does not need to go through many different sources as to figure out what to include/exclude when creating their test.

In relation to this I will also argue that the framework should be expanded into other versions as to include other methods than only using questionnaires. Here it will make sense to try and include data gathering methods such as interviews and focus group interviews, where some games may benefit more from this approach. As examples of games that could use the approach of focus groups I will specifically name games which try to relate a difficult subject (e.g. cancer) to players, where the game may do so in an abstract way that requires players to discuss the games in order to gain a deeper understanding of the subject.

As a further adjustment for the framework, I will also argue that the condition of reaching story key elements should be added to the three already stated conditions. This addition was brought forth when implementing the questionnaires in the 'Immersion' game.

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8 Conclusion

In this project it was attempted to create a framework for testing games, in which sources about intrinsic/extrinsic motivation (Ryan & Deci, 2000), Self-Determination Theory (Ryan, Rigby, & Przybylski, 2006) (Przybylski, Rigby, & Ryan, 2010), Continuation Desire (as a concept) (Schoenau-Fog, 2011a) (Schoenau-Fog, 2011b) (Schoenau-Fog, 2012) (Schoenau-Fog, Birke, & Reng, 2012), Flow Theory (Nakamura & Csikszentmihalyi, 2002) and Player types (Yee, 2015) were used as to both create the framework and the product to test it.

The final problem statement (FPS) was hereby formulated as: "*How can a test-framework be set up which can detect peoples game playing types and measure the level of continuation desire within said people to such a degree that the framework can help determine whether or not certain player types will enjoy a game or not?*"

As such the following framework model was created:
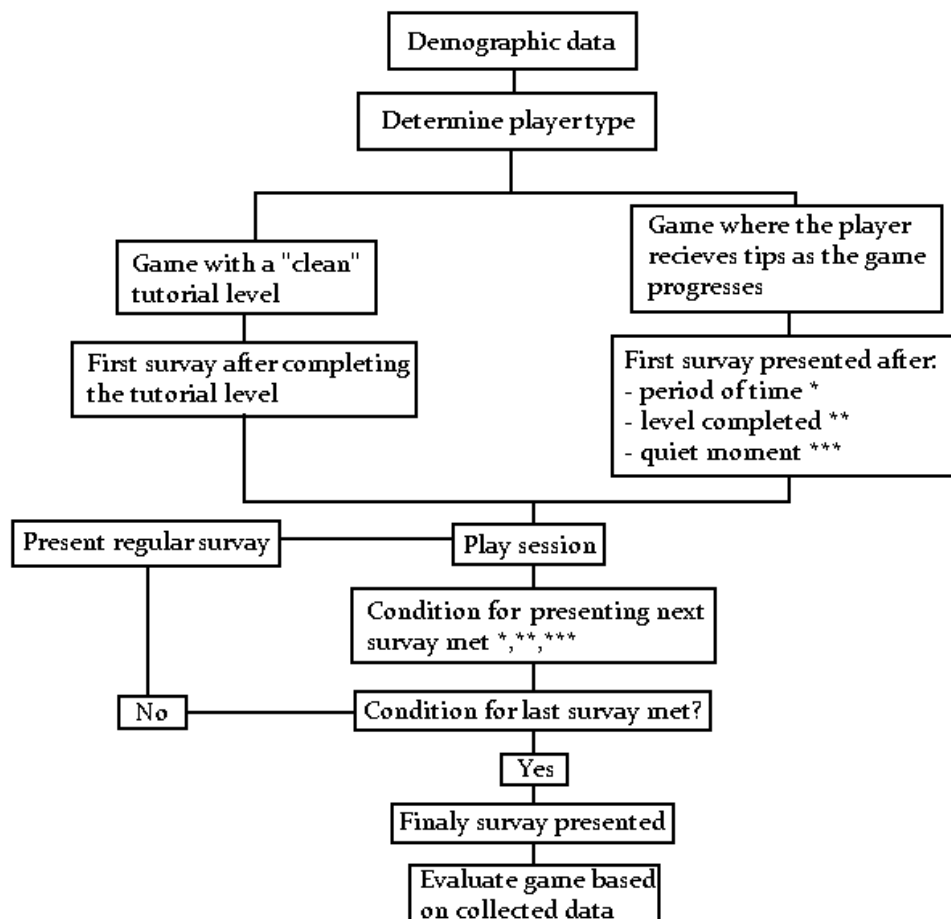
The product to test the framework created in relation to the FPS consisted of six games with the intent, that each of the games should cater to their own player type of the primary player types

presented by the Gamer Motivation Model (Yee, 2015). For the test there was only the result of four participants, and as such the results were processed in quality rather than quantity.

The results from the test showed that the method used seemed to capture most of the data needed in order to identify flaws and strengths about a game. It was however not fully capable of getting all required data, and as such the questionnaires design for this projects needs further work an testing to refine them.

In relation to this the framework model does not in itself suggests as how to design questionnaires and what data these should capture. As such the model need further work in order to include these features in a logical way, such that it can more easily be applied when trying to test games.

It can therefore be concluded for this project, that although the framework seems adequate in proposing an effective test method, it still needs refinement as to how to create questionnaires in relation to what data to collect.

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