Game design Dragoon

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Here we are, we finally did it, we committed so much ecocide and exceedingly kept producing CO_2 that the polar caps have melted. This resulted in an earth that we haven't seen since the arc of noah, one that is flooded all over. With most of the human population dead reptiles got a chance to evolve again. The result is: dragons. Earth turned into one big lagoon between what we before called 'mountains' that are now just little islands. Luckily few of us humans survived and we ingeniously came up with systems to pump the water elsewhere, sadly it doesn't stay there for long.

Some of us became friends with dragons. With their aversion to water we had more in common than we thought when we told stories about them in the far past. And now, now we are nomads exploring the world. And the dragon you are about to meet? Well he is trying to locate his lost flock while exploring this way to watery earth. And obviously only you can help him!

Game description

The game is a two-player game aimed at the Social Player type, as defined by Bartle [6]. The age of the players could vary as the game is quite easy to play and gets most of its fun from the playing together our recommendation would be players aged 10-30. It is up to the players to determine whether they want to either help or sabotage each other, and the players can change their choice at any time just by changing the way they play the game. This makes the game more fun from a social aspect, because the players are either challenging each other or working towards a common goal. Nevertheless playing together is the initial intent of the game as this could enable players to play the game more often switching tasks and getting further in the game by taking some resting opportunities even though they are getting tired. This is in line with feedback on the first iteration of the game.

Mechanic wise one of the players controls a flying dragon that is pulled down by gravity. The player has to jump on a trampoline to keep the dragon in the air. The purpose of the game remains the same: survive as long as possible. There are obstacles in the sky and items that have a positive effect. Since dragons are fire creatures, and fire is weak to water, the obstacles are formed by rain clouds in the sky and the rising sea level at the bottom of the screen. The mist clouds at the top of the screen exist to discourage the player from simply increasing the height to the limit as permitted by the game. The sea narrows the passage that the player can fly through over time, thus making the game harder as the player's skill progresses.

The second player rides a boat on top of the waves, and is gifted with a special mechanism to drain water. The player in the boat therefore has the ability to lower the sea level, thereby creating more room for the dragon to fly in. The pumping of water is also done using a distance sensor: the player makes a pumping motion with a pump like device that contains a distance sensor, the game translates this to water being pumped out of the sea. In the playable version of the game we use keys on the keyboard for this.

The dragon has an energy level that is slowly decreasing. Sheep, that spawn on land, can be eaten to provide a boost to dragon's energy level. Is there no energy left? That will result in a 'game over' state. Land also serves a different purpose. Once the dragon is on land, everything stops except the rising sea level, so the dragon-player can rest. Land is located relatively low in the screen window, so resting creates more work for the player controlling the boat, since they have to pump water out at a faster pace to keep the water from flooding the land and thereby killing the dragon and both being 'game over'. In the sky, packages fall down that the dragon can catch to get bonus points. Far underwater treasure chests can be found for bonus points. To get to the treasury the second player has to pump intensively though.

Helicopters also spawn in the sky. Helicopters contribute to rising carbon dioxide levels, and therefore also global warming. With the poles already being molten and the whole world being flooded they make the earth just heat up a little more. This warmed up earth makes the water vaporize and therefore disappear. Hitting a helicopter therefore results in a lowering of the sea level. This gives the player controlling the boat-pump some time to rest. This ensures that there is an equal balance between the two players efforts. Rest assured, both the islands to rest and the helicopters pop up more, further in the game when players start to get more tired.

The game also has some elements to contribute to the background such as birds and blow-up fish, as a form of environmental storytelling [7]. The game is meant to have elements such as temples, the Eiffel tower and other important landmarks in the background as well since the players are exploring the world *(See improvements and new levels)*.

Content

Development process

The objective of this assignment was to create a game using the game theories that were taught throughout the course. Coming up with a game idea, especially in a team of people with very different backgrounds, was no easy task. At the start of the project, the only things the team agreed on were that the game had to stand out in one way or another, and that it had to make proper use of the different game theories. This quickly led to the proposal of using a different controller to the game - a trampoline. Inspiration for this came from the company called 'embedded fitness' who aim to make games that let people exercise using sensors and gym equipment.

The next step was deciding on the development space: Why unity? The team believes that Unity offers various different options in building. Although the platform might be harder to understand, it can be used after this course as well to keep building (more difficult) games. Unity can be combined with Arduino and people have done this before. There is a large community behind it that has probably encountered the same problem, so there are many comprehensible tutorials. Unity was therefore the best option to go with.

The next step in the development process was to come up with the actual game. The use of a trampoline limited the game's input to two values: jump and stand (the use of multiple values for a more fluid gameplay was out of this project's scope). This greatly limited the type of games the team could come up with since jumping on a trampoline translated best to some sort of vertical movement in the game. Inspiration for games came from a game that is an easy time pass: Helicopter game [8]. But also from the Wii games that challenge players to move.

In the first stage of the project, all team members took on the role of game creator. Even though limiting the game ideas by using trampoline input as a constraint seemed like a bad idea at first, in retrospect it contributed greatly to the creative process. Had the team not had such a constraint, there would have been many completely different game proposals with no commonalities. The trampoline allowed the team to focus on more important tasks, like implementing the game theories, rather than debating over who's game idea had to be chosen.

The next step in the development process was to determine which game theories the team could build on. Before this could be done, it was important to define the player type for which the game should be made. Since jumping on a trampoline is more fun with a friend, the Social Player type [6] was the ideal candidate. Furthermore, the first iteration of the game had to make use of Flow theory and the game's aesthetics had to be described using Hunicke et al.'s keywords Sensation, Fellowship, Challenge, and Submission [1], since these seemed the most interesting to implement in combination with Social Player types.

Iteration 1

While developing the first iteration of the game, it was still unclear how distance sensors in combination with an Arduino could be incorporated as the game's controller. It therefore ended up being a single-player game that made use of a single keyboard key as its input, so it could easily be mapped to Arduino input in a later stage. The result was a simple game in which the player controlled a dragon flying in a never-ending sky full of obstacles, such as flames, asteroids, and items that changed certain characteristics of the payer, like the player's speed. The dragon was constantly being dragged down by gravity and the player had to press the "up" key ("w") just at the right times to keep the dragon in the air. The goal of the game was to survive as long as possible, with inevitable death at the end, but a possibility to improve the score.

Flames appeared both at the top and at the bottom of the game screen, and these flames took up more space as the game progressed, leaving less room for the player to fly through. Touching these flames would result in an instant death.

The game implemented the Flow theory by starting in a relatively non-threatening environment that became more threatening as the game progressed. In the non-threatening environment, the flames were at their lowest levels, so the player could get used to the game's mechanics without dying. The flames slowly grew every second, making it harder for the player to progress. The items that randomly spawned in the game window also contributed to the unpredictability of the game, which made it less boring.

The aesthetics of the first version of the game can be described using Hunicke et al.'s keywords Sensation, Challenge, and Submission [1]. Sensation was provided by the unpredictable locations of items. Sometimes, items that had a negative impact on the player's characteristics could not be avoided because avoiding the item would have resulted in a higher chance of hitting flames or asteroids. This, in combination with the growing flames, created a feeling of sensation. The game promoted Challenge using the scoreboard, so the player could either challenge himself by beating his previous high score, or challenge friends by beating their high scores. The game also promoted a feeling of an "undeserved death", due to unlucky positions of items and asteroids. Even though this was not intentional, play tests using family and friends showed that making a player feel as though losing was not their fault, made them want to play the game even more to show that they could beat the system. Finally, the game also served as a great past time, because the player usually did not survive for more than 5 minutes.

Overall, the biggest advantages of this version of the game was its very low learning curve, which made it fun for players of almost all ages.
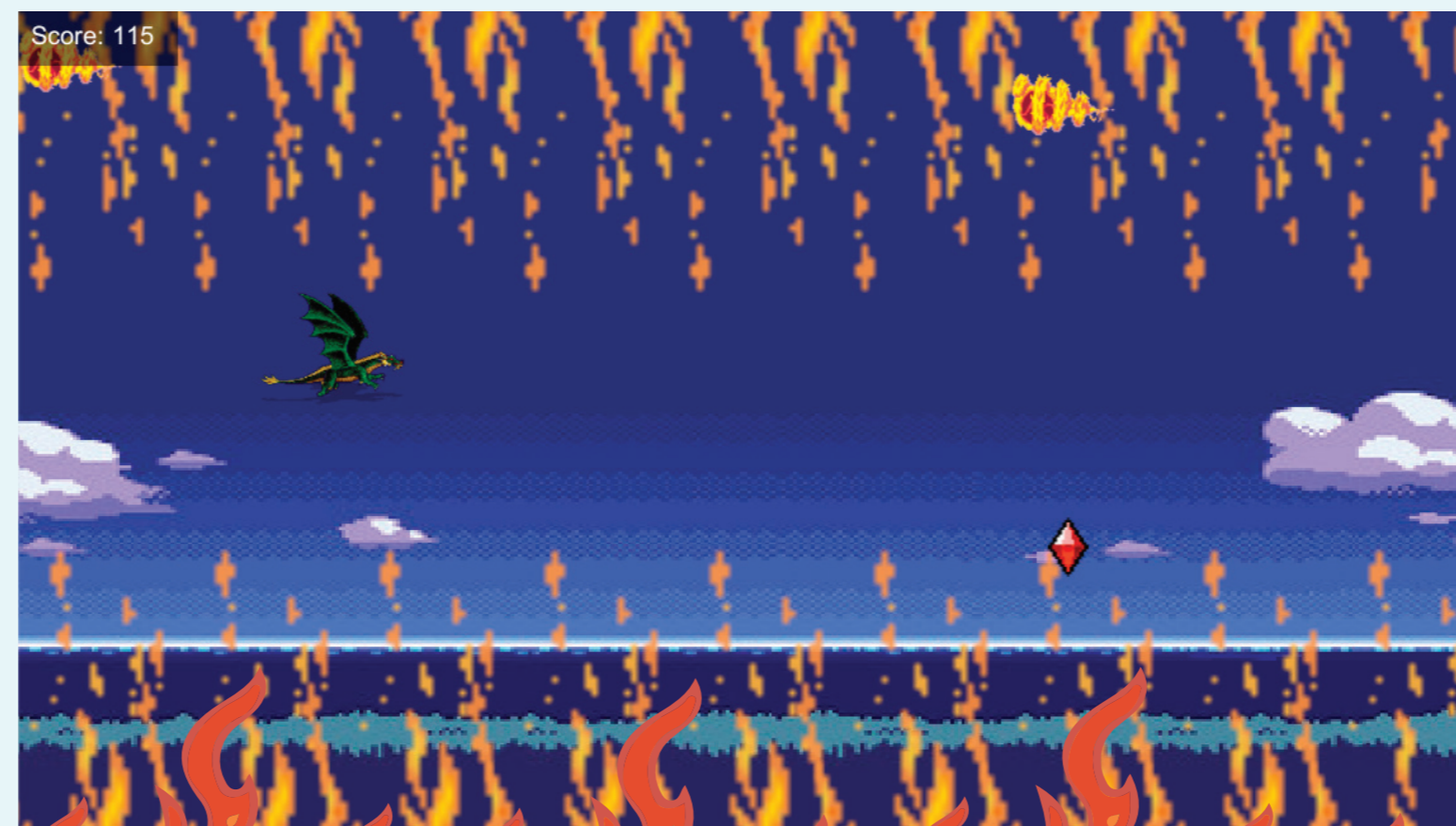
Screen-shots of the first iteration of the game

Iteration 2

During the mid-term presentation, the team received a lot of useful feedback on the first iteration of the game.

- Lack of a game story. The lack of a good game story was already recognized by the group as the biggest problem with the first iteration of the game. Plans had already been made to add a proper story for the next iteration.
- The use of a trampoline was praised for its originality. And the team agreed that they wanted to stick with it.
- There were doubts about how jumping on a trampoline would translate to in-game movements. An interesting problem that the group had not foreseen was vision distortion caused by jumping, which would make it hard for the jumper to see what was happening on the screen. Clear color differences were a necessity and an overall style would tie everything together better. Making something stand out only if the team wanted it to.
- The audience expected that reading jump signals could be a problem, since there is always a lag between the actual reading and the corresponding in-game movement. This would result in the player jumping, but not directly seeing the dragon fly as a response to the jump. The team decided that the only way to find out how the game would work in combination with a trampoline would be to test it.
- A solution had to be found to ensure that the player would not become frustrated if he became physically exhausted. The team already thought about a social game what would fit well with this context as you could also blame each other and laugh together. But there had to come another solution to make the game replay-able (when the player is even more tired).

After the midterm presentation, the team brainstormed about possible solutions. During this stage of the project, a clear distinction was made between the different roles of team members. Michelle took on the role of both game designer and game artist with a supporting role as programmer (Arduino to Unity), Robin and Nora took on the role of programmer, and Alain took on the role of documenting for the final report.

Even though all group members thought about how to incorporate a second player, and how to properly translate trampoline signals to in-game movements, Michelle's solutions were found to be the best. The figure below shows one of the sketches made by Michelle that was used to describe both the story that would be used for the second iteration of the game, and its mechanics.

The final iteration of the game would be built by expanding the first iteration. In order to do that, bugs in the game mechanics of the first iteration of the game had to be fixed. This was done by Robin and Nora. The bugs included issues with the scoreboard and a problem where nothing in the game, other than the background, would move if the player collected too many items that slowed down the player's speed.

Both issues were fixed, and the final version of the game was produced. Here iterations flow over in each other as an approach that is more like 'the Mario game approach', described during the lectures, was used. Trial and error helped the team find out what was fun and what was not.

Game analyses

The game is analysed using the following questions:

1. What is the game about and which elements constitute the game?
2. Why is the game engaging?
3. Analyse the game as if it were a strategic, mathematical system.
4. Analyse the game as if it were an experiential system.
5. Analyse the game in terms of the MDA model.
6. Analyse the game in terms of human motivators.

1. What is the game about and which elements constitute the game?

A global description of the final version of the game was already provided under the section titled "Final Version". Below is a more detailed description of the game according to the elements that constitute the game, and their roles. Sprites of these elements can be found in Appendix C.

Player Characters

Boat: The boat is one of the two characters the player can choose. The boat cannot win or lose the game; its only role is to either support or to frustrate the dragon. If you choose to support however you win together of course. The boat is also limited to one move, which is pumping water (or refusing to pump water). This was supposed to be done by making a pumping movement with a hand towards a second distance sensor that acted as a pump, but due to a lack of distance sensors and time, the space bar on the keyboard is used instead.

Dragon: The dragon is one of the two characters that the players can control. The dragon only has one possible move: flying upwards, which is done by jumping on a trampoline that is tied to a distance sensor. Since gravity pulls the dragon down and the game is filled with all sorts of obstacles, it is up to the player to determine how often he has to jump in order for the dragon to avoid any obstacles in its way.

Elements tied to the dragon:

- **Energy Level:** The energy level determines how much time the dragon has left before it dies. Dying due to an empty energy level bar is unrelated to dying due to hitting certain objects such as rain clouds or water. The player has to ensure that the dragon eats enough sheep to maintain its energy level. Energy can also be regained if the dragon lands on an island.
- **Score:** The score is determined by how long the dragon has been alive. When the dragon dies, the scoreboard is updated, and the score is compared to the list of high scores. Bonus points can be obtained by collecting packages that fall from the sky.

Energy

Score 2540

Environment & items

Packages: Packages fall from the sky and add extra points to the dragon's score.

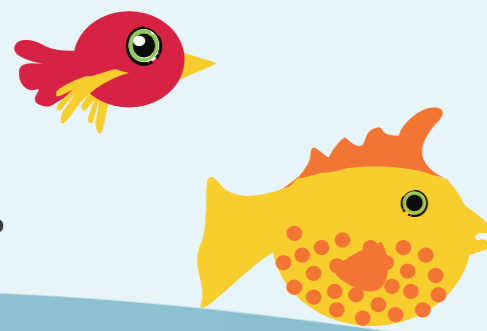**Helicopters:** Helicopters spawn in the sky and if the dragon hits a helicopter, the sea level drops.

Sea: The sea at the bottom of the screen is a constant threat to the dragon. It rises in proportion to the time the dragon has been alive. The sea level can be decreased in two ways: by the player controlling the boat, who has the ability to pump out water or by the dragon, who can hit helicopters that lower the sea level.

Sheep: Sheep spawn on islands and can be eaten by the dragon to regain energy.

Islands: Islands randomly spawn on the sea and give the dragon the chance to regain energy. Even though this gives the player controlling the dragon some time to rest, it places more pressure on the player controlling the boat.

Treasure chests: Can be found at the bottom of the ocean and add extra points to the dragon's score.
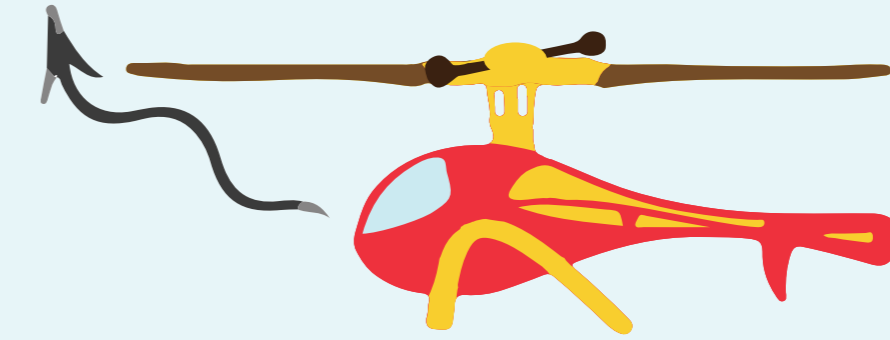
Rain clouds: Rain clouds form the greatest danger for the dragon in the sky. Since rain clouds are made of water and fire is weak to water, hitting a rain cloud results in an instant death.
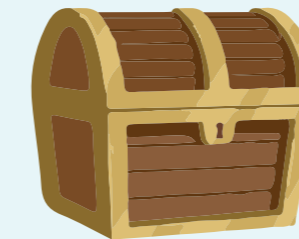
Fish and birds: decorate the world

2. Why is the game engaging?

Prensky (2001) mentions "fun" as one of the twelve elements that makes games the most engaging pastime [2]. Since "fun" is only one of these elements, this section describes to what extent the final version of the game ("Dragoon") meets the twelve elements that make games engaging.

Games are a form of fun
Prensky describes "fun" as something that gives us enjoyment and pleasure. Dragoon provides enjoyment and pleasure in two ways: by being a social game, and by combining gameplay with a fun controller. Jumping on a trampoline is already considered a fun activity, and when done with a friend it becomes even more fun. The downside to jumping on a trampoline is that it becomes boring very quickly because it has no real purpose. The game provides this purpose, by allowing an in-game character to be controlled through jumps.

Games are a form of play
Prensky lists three definitions of "play". The first definition says that play is something one chooses to do. The second definition says that play is utterly absorbing, and the final definition says that play promotes the formation of social groupings. Whether Dragoon meets the first definition of "play" depends on whether players will choose to play the game. However, it does meet the second and the third definition. When playing Dragoon, the players are utterly absorbed in the game since missing one detail can result in an immediate death. It also promotes the formation of social groupings since humans enjoy watching people struggle to control an in-game character with physical controls (as can be seen in Nintendo Wii).

Games have rules
The rules of Dragoon are formed by the effects that in-game elements have, such as causing the dragon to die or by giving the dragon an energy boost. This provides structure to the players.

Games have goals
According to Prensky, goals provide motivation. The goal of Dragoon is to survive as long as possible, thereby allowing the player controlling the dragon to obtain a higher score. This also motivates the player to keep trying. Another goal can be working together better or trying to make the other person fail as soon as possible.

Games are interactive
Dragoon is interactive because it translates trampoline jumps into in-game movements, and because it turns key presses on the space bar into a lower sea level. Players are therefore directly rewarded with results for the actions they have taken.

Games are adaptive
Prensky says that games are adaptive if they make use of Flow theory. Dragoon does this by increasing the difficulty of the game in proportion to the skills the player has acquired. The rising of the sea level, and the lowering of the energy bar in proportion to the time create the right balance needed to keep the player in the "flow". When the player plays a second time he can take more resting moments. The adaptivity of the game when replayed can be improved in the future (see new levels)

Games have outcomes and feedback
The game provides outcomes and feedback through the use of in-game items that have different effects. The outcome of hitting a rain cloud is for example much different than catching a package. One's score can also be interpreted as feedback.

Games have win states
Dragoon does not have a standard win state. The win state is only reached if a player obtains the highest score on the scoreboard, thereby making it even more challenging the next time the game is played. You can however beat your own records and endurance.

Games have conflict/competition/opposition

Dragoon provides competition through the use of a scoreboard. Conflict and opposition are optional, and are determined by the players while playing the game. If the player controlling the boat refuses to pump, they will become the dragon's enemy since the dragon will have to work harder to lower the sea level on his own by catching helicopters.

Games have problem solving

The problems the game presents are related to how often the player controlling the dragon must jump to either catch items that are useful, or dodge items that are dangerous. It is up to the player to find the right combination of jumps.

Games have interaction

Dragoon provides an opportunity for interaction between the two players playing the game. The interaction can either be encouraging if the players are playing the game as a team, or mocking if, for example, the player controlling the boat tries to make the game as hard as possible for the dragon. Interesting is that most of the interaction is not in the game but outside of the game.

Games have representation and story

Prensky argues that representation and story help create emotion. Even though Dragoon does not have a set story with an ending, the graphics are the game's representation. But on a more abstract level almost every teenager wants to go out and explore the world and feels like drowning sometimes. The cartoon style also contributes to a feeling of "fun". But so does the deeper meaning of the storyline which is a representation of what we are doing in real life. We look at how we are treating the world and ourselves right now (ecocide, CO_2, obese) and incorporate this in a non-confrontational way with it not being the main objective of the game but adding an extra layer to the game that is not recognized immediately. Spoiler alert: it involves you jumping to stay alive and the earth flooding. We took a card from a playbook from one of the games the

team analyzed: just like Pokemon Go made you move in real life as well without it being a game about physical activity although the need for physical activity in Dragoon is more present as you cannot play without it.

Extra's

Prensky also mentions that the game must be balanced in order for it to feel fair for all players. Since the dragon is the game's main character and the player controlling the boat is a helper, special attention had to be paid to ensure the players became more balanced. Giving the boat control over the difficulty level of the overall game was a first way this was achieved. The boat can decide whether to help the dragon by pumping out water, or whether to make it more difficult for the dragon by not pumping out any water. This made the game less balanced for the dragon, because in a competitive setting, the position of the dragon would be much weaker. Adding helicopters to the game that give the dragon some control over the sea level, helps balance the player roles.

More theories than only Prensky's can explain the motivation players have to play Dragoon. One of these theories is Guyans theory [3]. He states that players tend to approach video games in pursuit of one or more of the following psychological states. Competition: the thrill of defeating others. Challenge: the experience of success following effort. Diversion: to escape an experience of stress. Fantasy: to experience novel or unrealistic stimuli. Social interaction: to socialize. Arousal: to feel positive emotions [3]. Competition, Social interaction and Challenge are most in line with the theory discussed above. But also arousal (the brain's reaction to scoring points and physical play) is part of Dragoon as presented. Diversion and fantasy are more or less part of the game as well. Diversion because of the easy go cartoon style and the physical relief a player can find when playing the game. And fantasy because of the dragon, a future scenario and flying. Nevertheless it is more likely for a fantasy player to pick a game that allows for picking a character and experiencing more of the fantasy world than Dragoon allows.

3. Analyze the game as if it were a strategic, mathematical system.

When the game is viewed as a purely strategic, mathematical system [4], it consists of the following objects, attributes, internal relationships, and environment

Objects

- The characters that the players can choose to play, such as the flying dragon and the water-pumping boat.
- Parts of the in-game environment that have special functions, like the rain clouds, the rising sea, and the small islands.
- Items that either have a negative impact on the player or enhance the characteristics of the player or its environment, such as sheep, packages, and helicopters.

Attributes

- The score that is attached to the dragon and represents how long the dragon has survived so far.
- The energy level of the dragon that shows how long the dragon can still fly without resting or eating sheep.
- The current position of the dragon, which is determined by how the player controlling the dragon jumps.
- The current level of the sea, which is determined by how fast the player controlling the boat pumps.
- The locations of certain in-game items. For example, sheep only spawn on the small islands, and rain clouds only spawn in the sky.
- The effects that in-game elements have on the dragon.
- How often a certain item will spawn within a certain timeframe.
- The force with which the gravity pulls the dragon down.

Internal relationships

- The internal relationships consist of the position of the dragon in relation to other in-game elements.
- The position of in-game elements can either be a threat to the dragon if they have a negative effect on the dragon, such as dying; or can encourage the dragon by providing bonus points, lowering the sea level or raising the dragon's energy level.

Environment

The environment is the game in the digital world in the context of play.
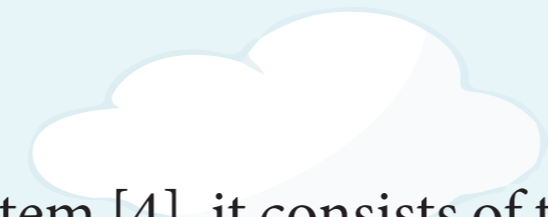
4. Analyze the game as if it were an experiential system.

When the game is looked at as an experiential system [4], it consists of the following objects, attributes, internal relationships, and environment.

Objects
- The player controlling the dragon
- The player controlling the boat.

Attributes
- The dragon, including its energy level, score, and current position within the game.
- The boat, including the current sea level.

Internal relationships
The social interactions between the two players form the internal relationships. Such as mocking each other, encouraging each other and deciding to play together or compete.

Environment
The environment is the total environment in which the game is played, which includes a trampoline, a distance sensor, an Arduino, a computer, and possibly a big external screen. It also includes the digital world in the game.

5. Analyze the game in terms of the MDA model.

Hunicke et al. describes an MDA model, that consists of Mechanics, Dynamics, and Aesthetics [1]. The mechanics of the game are described by the elements that comprise the game, the behaviours of those elements, and the relationships between them. A UML class diagram, as seen on the next page, was used to depict this. This diagram shows the most important relations and functions.

The aesthetics of the game can still be described using the keywords that were defined at the start of the project (iteration 1), which are: Sensation, Challenge, Fellowship, and Submission. How the dynamics of the game help create the aesthetic experiences is described below.

Sensation: The final version of the game provides a sense of pleasure when the player is able to overcome certain obstacles such as dodging a rain cloud just in time, or catching an item that has a positive effect. Excitement is caused by not knowing when an obstacle will be in the way, and having no control over how fast the friend pumps out water. The combination of both pleasure and excitement leads to a feeling of sensation.

Challenge: Challenge is mainly provided through the scoreboard, and the decreasing energy level. Players can either take turns playing the dragon, and try to beat each other's high scores, or they can try to beat their own high score. The decreasing energy level creates a challenge against time. A sense of challenge can also be created by the player controlling the pumping boat. If he chooses to pump slower, the game will become more challenging for the dragon, which in turn leads to more fun social interactions.

Fellowship: The player controlling the boat does not necessarily have to make the game more challenging for the dragon. The players can also work together to ensure that the dragon survives as long as possible.

Submission: Since death is inevitable, the game usually does not last very long. This makes it an ideal pastime in social situations, such as parties.
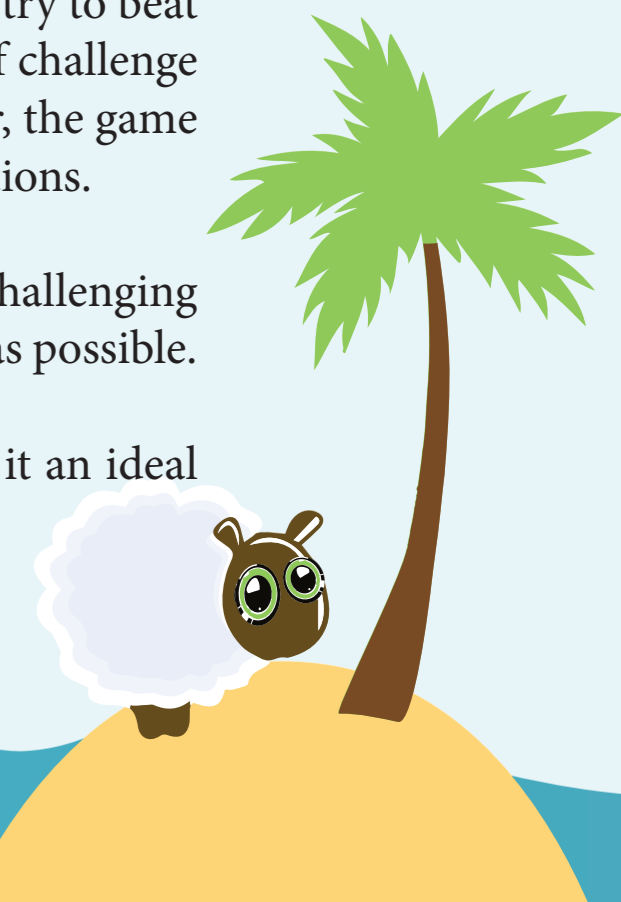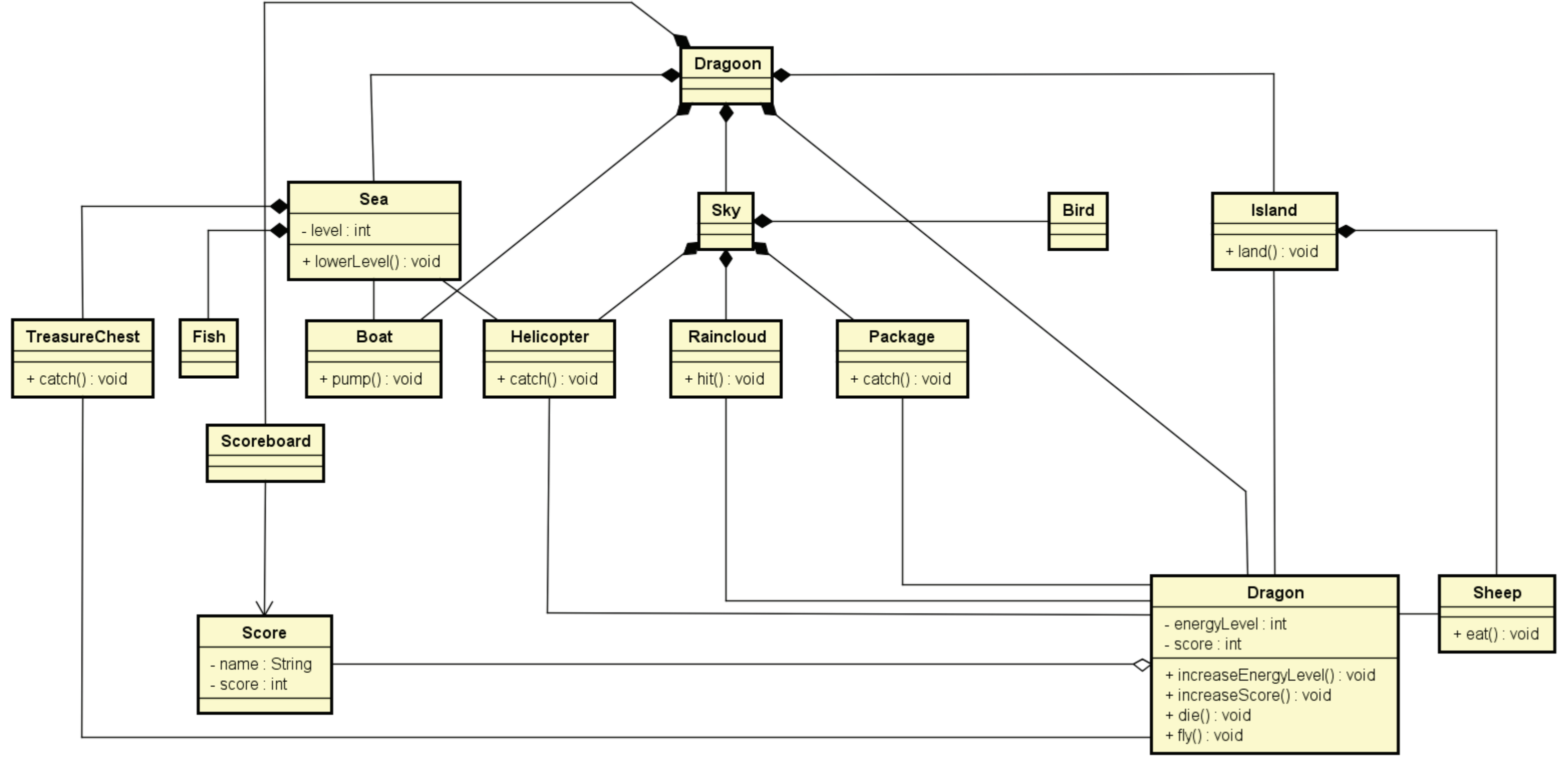
A UML-class diagram of the game Dragoon

6. Analyze the game in terms of human motivators.

Source [10] explains that people play games because they experience emotions that are closely related to the main factors of happiness. It states that people have what Dr. Steven Reiss calls: The 16 basic human motivators and their object of desire. Of these 16 motivators some can be related to our game.

1. physical activity
2. curiosity, this is about exploration of the game exploring the possibilities, how far you can get and what you might find. This can be strengthened by an improvement named in improvements and new levels.
3. Power, two players both have power over each other's difficulty level and resting moments.
4. Vengeance, as stated the game is competitive. It can be both competitive toward each other and trying to improve one's own high score.
5. Saving, the dragon player tries to eat sheep to keep the energy bar high even though it is not always necessary. A player collects many items throughout the journey, but most have immediate effect. The player does collect as many points as possible.

According a list of the 42 things that cause fun [9] there is a relation between those 16 basic human motivators and 42 fun factors. From this we can derive that in our game the fun factors such as excitement, exploring a world and mastering skill can be found which is in line with theories discussed before.

New levels and improvements

Bonus level: exploring space

With all the water and the constant need to keep flying, earth might not be the best place to live or explore. Too horizontal for a dragons' taste. The bonus level can be triggered by catching an object that's fast and difficult to catch: a rocket. This level would make a serious variation on the regular gameplay dismissing the upper and lower mobility limits of the screen and only letting the obstacles threaten the player; the obstacles being asteroids and stars. And the environment being shaped by galaxies and/ or planets/suns/stars in the distance.

The dragon can keep going up and up, but what will it find there? Stars? The dragon cannot be too fast as it might hit a star that cannot be seen on the screen yet. There is only one problem to this dragon moving in space. Even dragon's need oxygen. For this the second player is still much necessary, the second player can pump oxygen into the air so the dragon can survive.

An addition to make this harder is that the pumping player needs to be pumping when the dragon opens his mouth to breathe otherwise all oxygen is just lost. Depending on the dragon's movements his breathing moments are determined. This can teach the pumping player to really pay attention to the movements of the dragon player and to respond to one another better. This is a level you can only play when trying to help each other, how do you get the other player to help you in real life?

And how does one move through space? Multiple distance sensors and the direction in which you jump would make this level more complicated and affords the dragon-player to gain more jumping skills in real life.

This level adds fun in terms of variance. It enables the player to develop more depth in skills and different skills. It also lets the player explore more and can trigger curiosity. Considering the appeal of the game to the social player type that is already there by real life interactions this is a logical option to make it more interesting for a achiever player type. This player type would like to feel as if he is making advances which is what this level offers as well. Lastly it could contribute to the transformation stage of the game, do dragons belong on this earth? And what will we do when earth floods? A cutscene between this bonus level and the game would help explain why the dragon went to space and what the situation on earth actually represents.
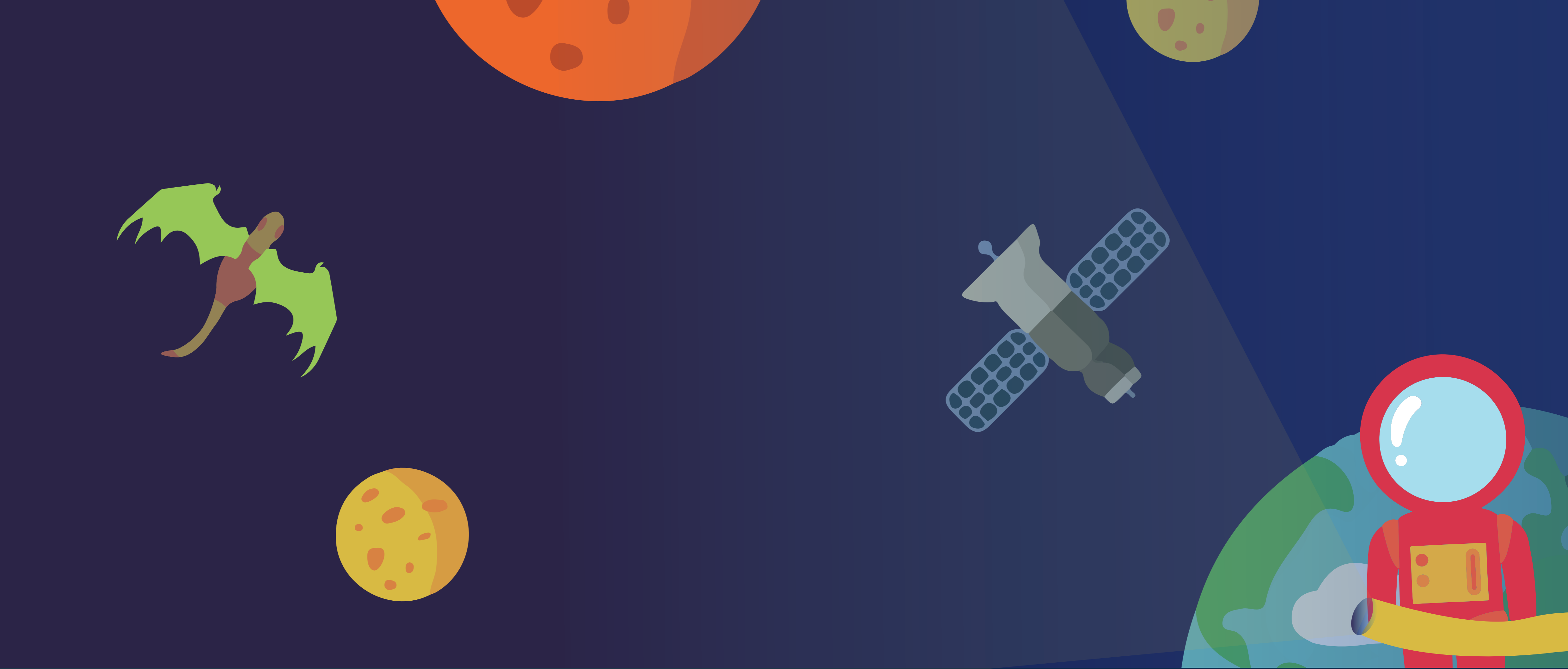
Score 28

Oxygen

Creating 'levels': background

The game is for a part about exploration of the world. This is not very much seen in the game as it is the background stays the same. The background should include those places in the world one might know such as pyramids, the Eiffel tower, the Borobudur, chinese temples and weird buildings in Dubai. Passing by these buildings would enlarge the players sense of accomplishment. A player gets points for staying alive longer but what has the player discovered? These sunken Atlantis like locations could also make interesting starting points for replay of the game. It could be locations the player can start from after dying so the player does not feel like a complete loser for having to start all over as he will start at the last location he encountered. He can continue from a later location than the first and explore more of the world. This keeps the exploration interesting and gives the player a sense of accomplishment. Altogether it makes it more likely that the player will continue playing even though he is getting more physically tired after a while considering the player is not fully set back but only a little.

More game feel

What needs improving is the game feel and the smoothing of the game. Showing scores you gained should be exaggerated more. Hitting the bad clouds and dying should feel worse than they feel now. Impact has to be seen more to allow for more extreme feelings. This is necessary for the emotional relieve that many game players seek and more extreme fun!

To create better immersion game mechanics should work smoothly [5]. This means that the dragon should smoothly go up and down, the sprites animation should be easily watchable and the water should not make small jumps but just 'flow'. The jumps that the dragon makes stand out the most as non-smooth now. This is due to the trampoline interaction: the game cannot handle the input faster. This means that making the dragon move smoother would result in a delay of the reaction to your action and this would be more annoying as a player does not feel in control anymore, This smoothing needs some attention in the future.

Qualitative jumping

After a while a player can have found out that he does not really have to pump heavily or jump high. A bit of hopping is enough for the trampoline and distance sensor to recognize your movement as a jump. This is interesting as a player can use this in his advantage, getting physically tired later. To make the game more skill based and reward the efforts of a player better the quality of one's jumps can be assessed. Translating how high a player jumped to the amount of movement that the dragon makes as well. Or the amount of water that is pumped away in case of the pumping player. This challenges the players skills in a more qualitative way and enables the player to develop actual skills in jumping and playing the game besides timing. After all, sometimes a big jump is needed and sometimes a small jump is needed.

Picking a character

To enhance immersion a player could choosing and customize one's own character. By choosing the kind of dragon and the dragons color. The kind of boat and boat color and the looks of the person in the boat. A very cool added feature would be the ability to draw one's own character and use that this would make the player feel very autonomous and makes the player relate to the character more. This adds to the players fun in terms of intrinsic motivation to play the game taking into account the self-determination theory [5].

Self-learning Mechanism

A new version of the game could also include a self-learning mechanism to determine whether the game is too easy or too difficult for the current player of the game. This could be done by analyzing the previous scores of the player. The game will then automatically adjust the difficulty level based on this analysis. Since the "Flow" zone is different for different players of the game, this can help ensure that the zone applies to all players of the game, and not just a small group for which the game's mechanics were optimized. Acknowledging player skills in such a way helps contribute to the player's need for competence, as defined by Przybylski, Rigby, Ryan (2010) [5].
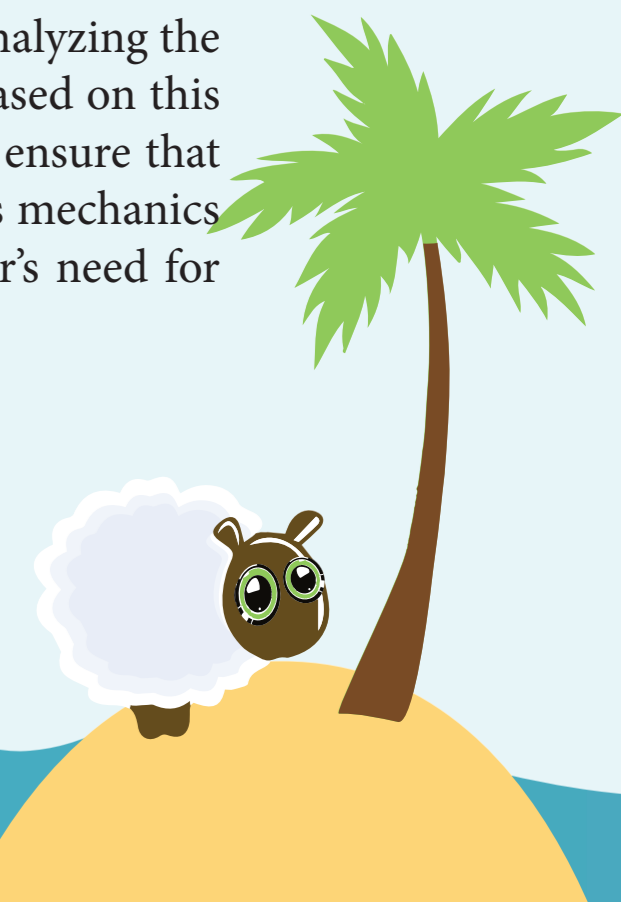
Score 282

Energy

Exploring various characters by choosing colors, types, hairstyles and sexuality.

Reflections

Nora

Even though I study Software Science and play games like Tibia and World of Warcraft on a regular basis, I had never given much thought to the creation of games. Initially, the game creation assignment of this course seemed especially easy for someone who likes playing games. I have never been more wrong. I was surprised that having played other games limited my creativity more than it helped; I kept trying to modify concepts that I liked from other games, rather than coming up with original ideas. During the project, I took on the role of programmer (in Unity) together with Robin. We often implemented features individually and combined those to form a completed iteration of the game. Surprisingly, I don't enjoy playing games now as much as I did before taking this course. I used to play games as a form of immersion, but recognizing all the tactics that are used to make the game fun, distracts from my ability to get lost in the game. Overall, this course really taught me how intriguing the field of gaming can be, and I look forward to applying the game theories that I learned to my own game design projects.

Robin

Until this course the only experience I had with making games was with programming exercises. The theory in the course really gave me a new insight in the development of games and I realised that it requires more than just making an idea work. I also look at games differently now, thinking about how the developers designed and made it. Working with Unity and our game really improved my programming skills and I hope to be able to continue working with it in the future. Something that I learned regarding project work is that iteration is very important. We scrapped our earlier idea and added new ideas and redesigned old ones, to come up with our final design which is a better end product then what we initially had.

Alain

At the beginning of the course I felt a minor sense of excitement about making a game. I immediately began to think of a concept, hoping that a very original idea would strike me. One night one such idea came to mind, and I experienced a surge of inspiration. I wrote everything down and the next day I worked everything out in detail, drawings included. The idea was for the game to revolve around a plant, which you would control and develop to be better equipped at absorbing sunlight, gathering water and withstanding hazards (snails, trampling etc.). The goal of the game would be to gather sunlight and water to make the flower of the plant bloom. And the game would, correspondingly be called BLOOM, as a reference to both the purpose of the game and the dutch translation of flower. This idea set me up for the biggest lesson and disappointment of the course, as my idea was rejected and a motion-controlled flying game was counter-proposed. I did not object to this idea because I thought it was a good idea, but I didn't like it. As such I learned or rather, was reminded that having a seemingly good idea does not mean your idea will be accepted. And that working on any project (such as a game) may mean you have to work on something that does not appeal to you personally. Despite this I resolved to contribute to the new idea, starting with the designing of the concept and providing ideas. Regretfully, I failed to properly install Unity on my laptop, restraining my ability to program the game. Instead I offered to compensate largely by working on the report, along with the usual participation during our meetings. To describe the general life-lessons I learned from the course it suffices to say, as mentioned earlier, that signing up for a project (making a game) does not guarantee that your proposed directions will be followed and that you may end up reluctantly working on the once exciting project. Still, it was somewhat an interesting experience to work on something that ended up so different from what I expected. Making a motion-controlled game was not something I was counting on, and perhaps the experience will in time prove useful.
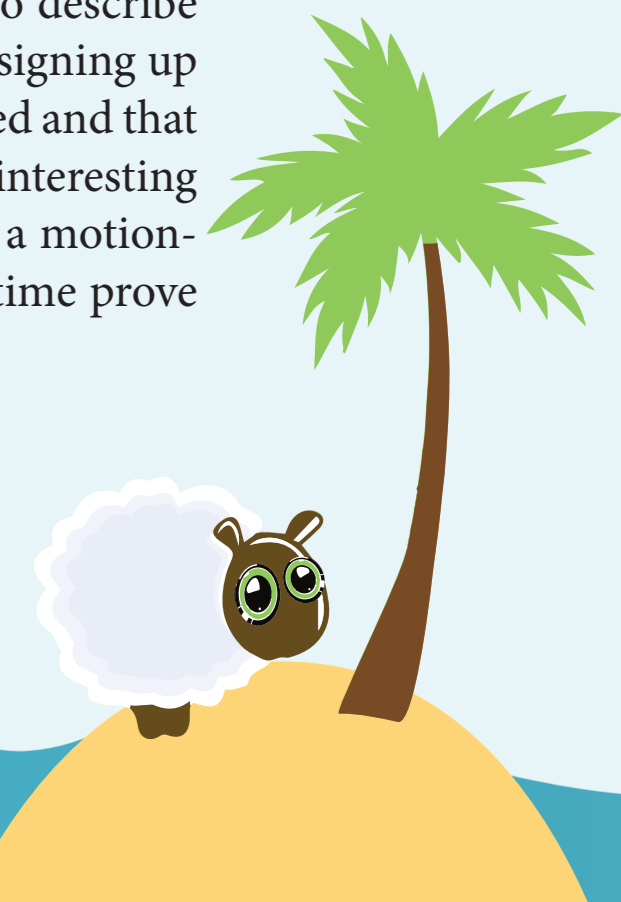
Michelle

In this elective I acquired theories that help me understand and write down my vision on design better. I found weaknesses and strengths in not knowing much about games and decided that learning more is a necessity, I found inspiration with Ralph Koster and board games and I learned that I prefer to brainstorm together even if a group is not used to this. I learned that I enjoy working with people from other disciplines that have more or less the same interest area (in this case games) whereas working with people in other disciplines with very different interest has given me trouble before (bachelor college: design).

Choosing this elective while I not necessarily like playing (online) games might seem interesting to everyone else following this course. I however feel like it helped me. Current society asks us to constantly want something and be buried in work to achieve it. When constantly working for something we better love doing it. I want to inspire people and help them find the motivation to continue learning. And it turns out that this learning is a big part of fun. This means that I want to add fun to more serious subjects. I tried to do this by coming up with games that address these subjects in a way that is not serious. In this case the impact of humanity on the planet and our need for physical movement. I think this worked out OK but this second layer might be too hidden in the end result and needs some work. Therefore I will we following the second course of games and play as well.

Although I did not have a huge pile of inspirational games to pick from because I simply did not play them before this was a weak point and strength. It was a strength because I did not let existing games influence me as much, staying more objective and a weakness because I figured that learning about those other games could help me to make decisions for the one that we were developing. I needed examples to go with the theory we learned. The Nintendo Wii already used physical controllers and social situations that helped me find the strengths of the game we were developing and the weaknesses we needed to think about.

In my full on obsessive research into fun I learned about Ralph Koster whom became an inspiration. Because of his book that summarizes almost all things said about games and game design from the Greek philosophy till now. But mainly because of the comment that we should learn from board games. 'If it is not fun in a simple board game with cards it is not a good game in the digital world either' he illustrated this with an example 'fishing and just getting a different fish each time you pull back the rod' it is sort of fun on a phone but this mainly is because of the animations. You would be bored after two times when it was a card game the excitement of merely which fish you are going to catch is not enough the game needs more body. This helped me when thinking about our game, was it still fun as a board game (does it have enough body)? This approach, of both researching existing games and using the board game theory, resulted in more creative ideas with a body and later on made me responsible for the game design and game art as my group found these ideas to be the best I really enjoyed this way of working as well. And with every new theory we learned I adapted the game idea a bit.

Lastly I used a different way of working than I would normally do at ID. Brainstorming was not something we did together but rather at home. This was not necessarily a bad thing as it worked. Sometimes we combined ideas and sometimes we just picked something. Although it worked in this case I do not think it necessarily always works. I prefer brainstorming together, even if I have to put in more effort since this is not a normal activity at other faculties. This way we can create ideas everyone can fully get behind and that incorporate strengths of the ideas of each of us right from the beginning it can also lead to more creative ideas. I enjoyed working on this assignment a lot especially with a nice and motivated team where we really had our own contribution due to all the personality differences and differences in strengths.

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Game instructions

The game can be played in two ways: using an Arduino in combination with a distance sensor, or using keyboard keys.

If an Arduino is used, the correct COM port has to be provided in the Port input field, before starting the game. If keyboard keys are used to play the game, the Arduino settings can be ignored and the game can be started leaving the Port field empty.

If keyboard keys are used, then the "w" key is used to simulate trampoline jumps.
The space bar is used to pump out water, both in the Arduino version and the keyboard version of the game.

Appendix A

1. Icy story

One of the considerations for the story was for the game to take place during the beginning of an ice age, in which rapid changes in the (natural environment occurred). The idea was that one of these rapid changes involved a chaotic rise in the ocean's tide bringing about exceptionally large waves and other hazards often caused by the weather. This would leave a flock of dragons caught in the water, which due to the substantial decrease in temperature would leave the beasts frozen and encased in a very thick layer of ice from which they could not escape.

The player takes on the role of one of the exceptions, an individual dragon that did not meet the same fate but instead survived being swept away with the current, waking up from unconsciousness on an unfamiliar beach. This event would leave the protagonist dragon understandably averse to water. Still, the objective of the game would be for the dragon to fly back over the sea, searching for his lost flock to liberate them from the icy prison. The dragon would be compelled to feed on on the way while avoiding the water below it in fear of not surviving another incident.

The unexpected ending of the game would be that you never reach the ice prison. Upon losing the player would be presented with a message saying that the dragon failed its mission and that the dragons will never be saved. At this point the player would still believe that winning the game is possible. After repeatedly trying again and again however, the player would realize or perhaps even be told by the game that whatever the dragon does, it can and will never reach the ice prison and the dragons will meet extinction. Corresponding to real life, this would explain why there are no dragons in the present. Alternatively one could consider an ending or a bonus ending where the dragon does reach the ice prison and frees the dragons, and rescue the flock after all.
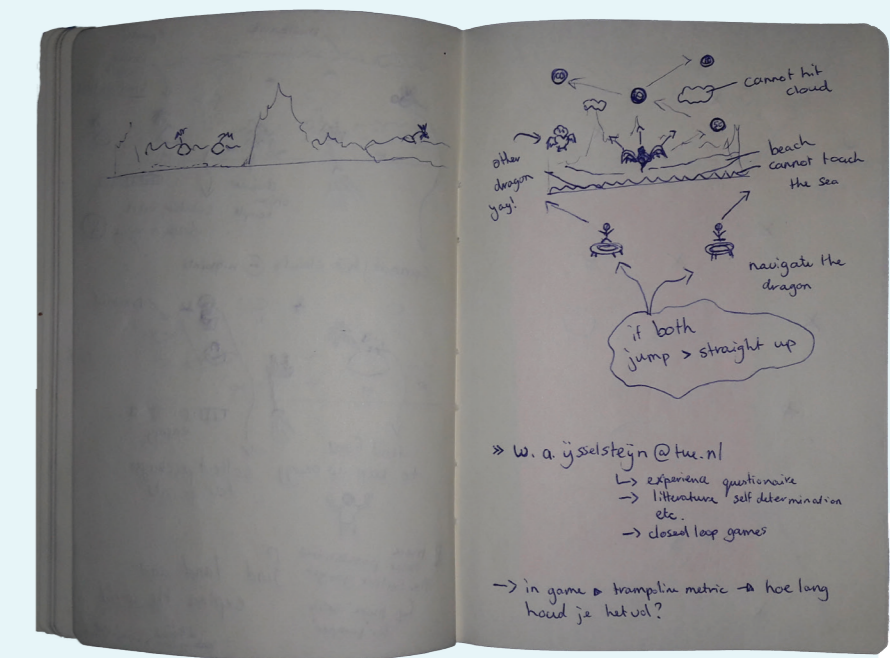
2. New level: Icy wastes

A necessary complement to the revoked story would be a (final) level(s) that are ice-themed. If the revoked story were actually implemented this level could serve to host the final objective: the ice prison. An ice-themed level should be quite manageable as it allows for easily justified water on the lower bound of the screen, and provides several kinds of obstacles such as pyramid-shaped icebergs. Concerning the decoration of the level it would suffice to add background-landscapes resembling those of arctic areas, and of course penguins.
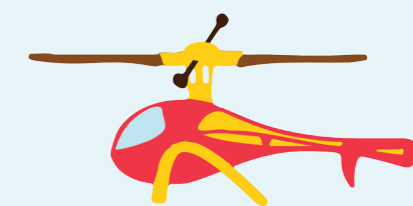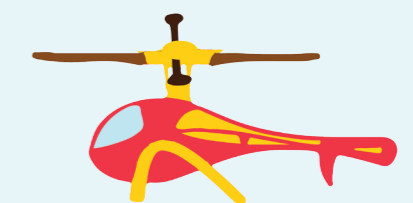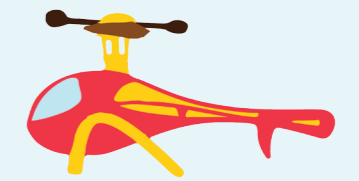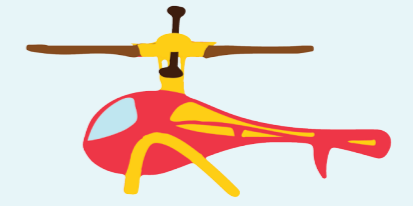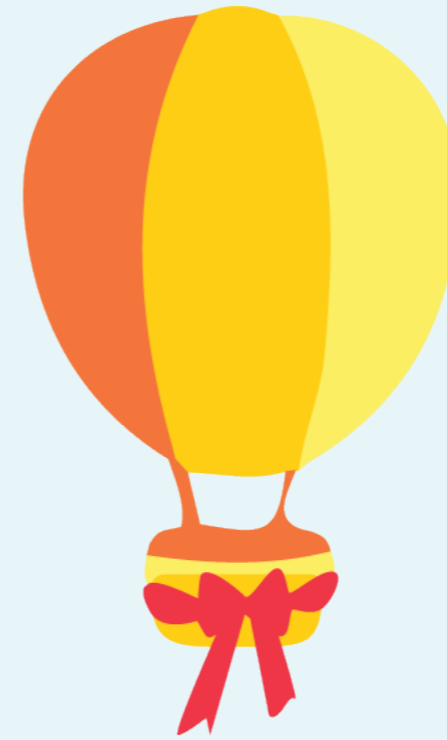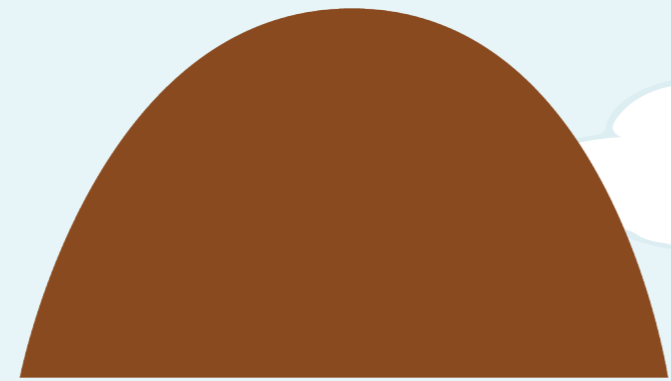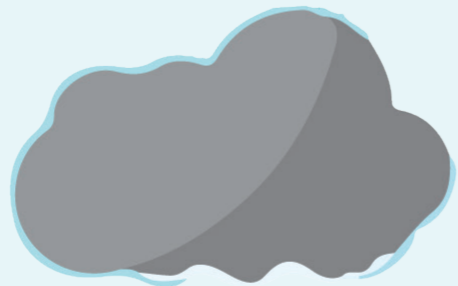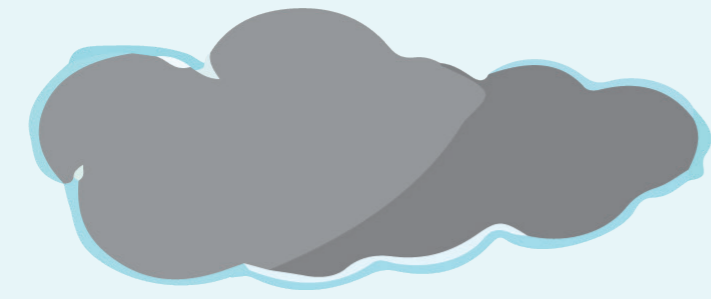
3. eggs feature

A test user commented that it would be fun if the game included dragon-eggs that could be hatched if the player made the dragon fly into it, spawning a baby dragon that would follow the dragon and spew little fire balls. This could be amusing and would certainly add to the cuteness of the game but it also distracts from the game play and where to look. With the jumping that already brings visual impairment it would probably not be the best option.
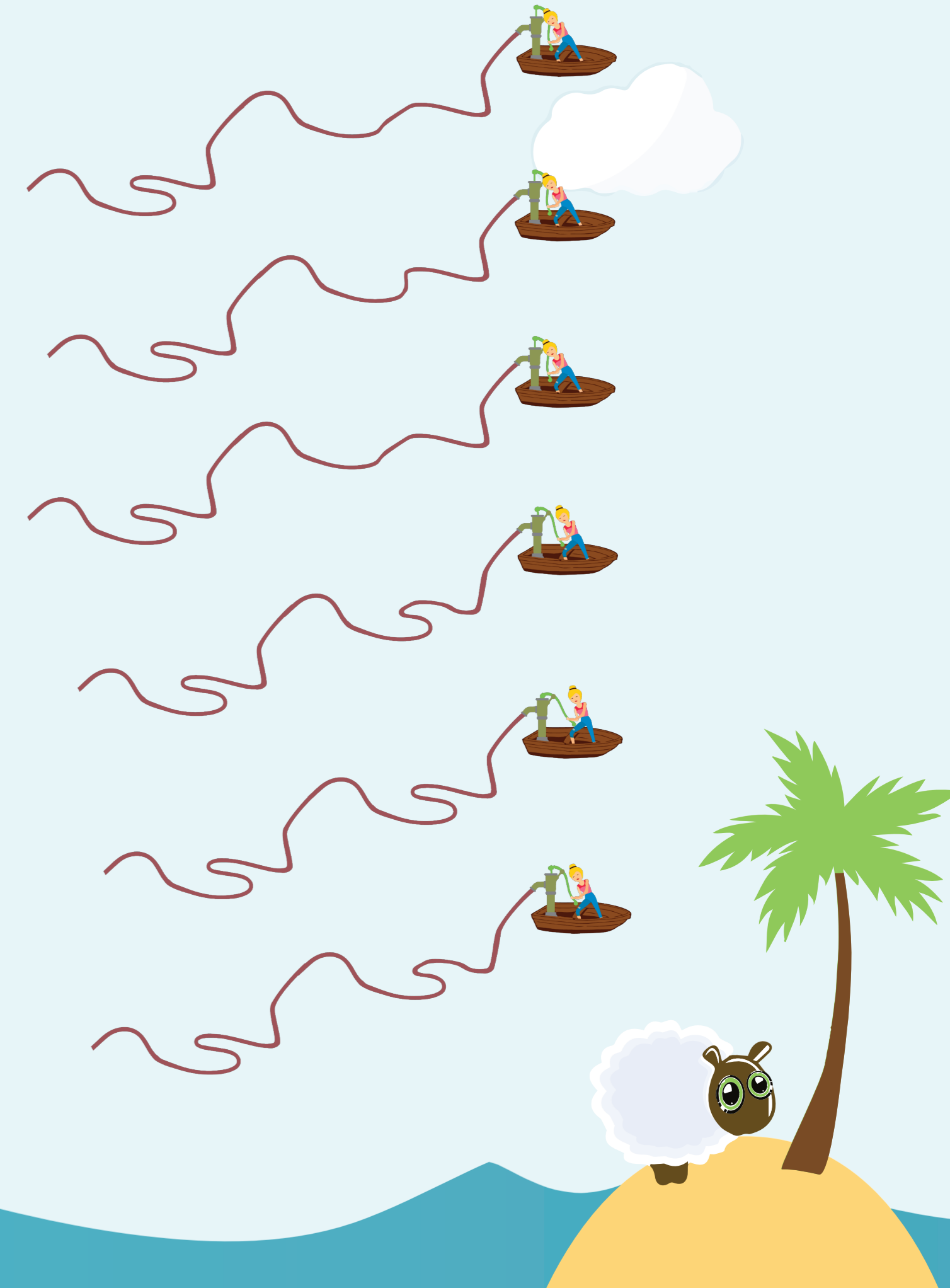
4. Game where 2 players work together to move the dragon up, the direction is determined by two jumpers jumping together or apart from each other.

Appendix B

Appendix B