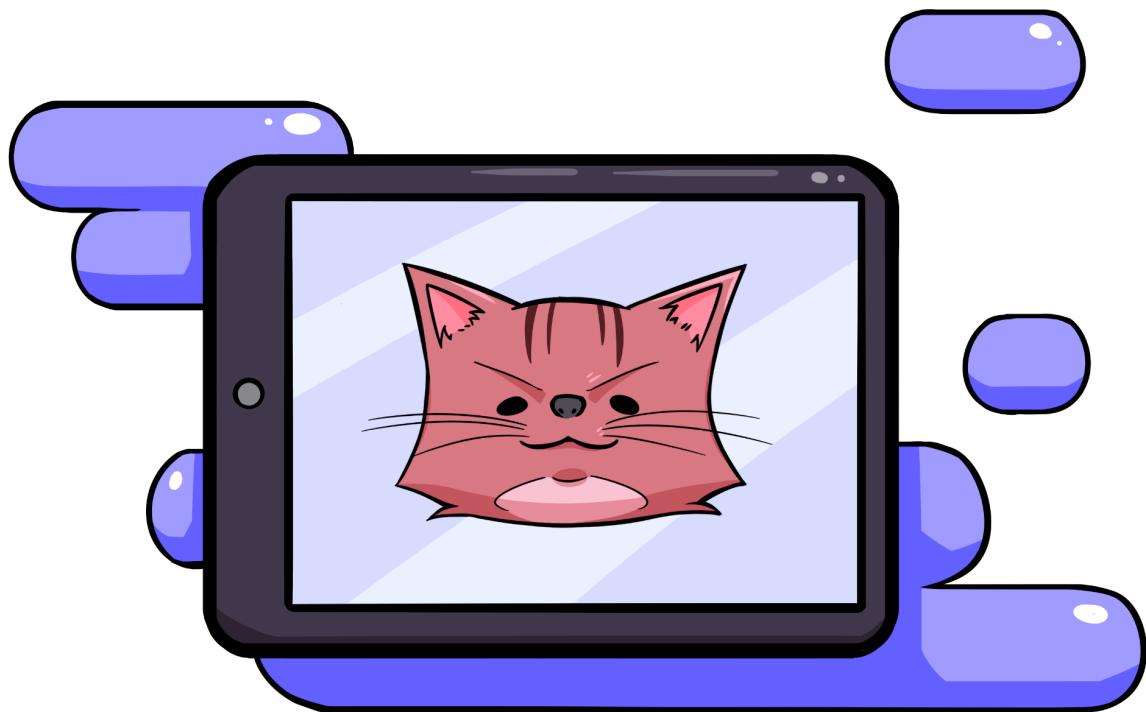


IMT&S Wilminktheater Project Devlog

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Wilminktheater

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Introduction

The project aims to make the current teaching materials used to introduce school children to the Wilminktheater in Enschede([Website](#)) more engaging and interactive, to help children retain theatre rules and information more effectively. Traditional materials, in the form of teachers explaining and children listening, often result in low student engagement which leads to chaos during theatre visits.

The current approach employed by the teachers and theater staff is not effective for kids to retain the information. Teachers and staff take the time before and during the school visit to explain the code of conduct to the children but due to the low engagement and the stimulation of a new environment, the information doesn't stick.

To address this, the Wilminktheater seeks to develop a playful, flexible game that can be used with or without a teacher. The goal is to create a fun and educational tool that keeps children engaged, ensures they remember theatre rules, and reduces disorder during school performances.

This project was first initiated by Bo Hamer during her graduation internship at the Wilminktheater, who is now working for the Wilminktheater as a Front Office Receptionist. She developed a prototype for a 2D Point & Click game as a medium to show the theatre locations and introduce the children to the code of conduct at the theatre. Based on user tests she conducted, the prototype showed promising results and was passed on to our team for developing and improving the concept further.

The Team

The team working on this project is made up of six, 4th year students from the Creative Media & Game Technologies Bachelor at Saxion University of Applied Sciences in Enschede.

Name	Role	Portfolio
Alexis de Cazenove	Designer, Team Leader	https://alexisdecazenove.online/
Jose Peiro	Designer	https://joseapeiro.github.io/JosePeiro.github.io/
Amber Kortier	Engineer	
Artiom Vostrenkov	Engineer	https://www.vostrenkov.nl/
Thomas Reijmerink	Artist	
Jekaterina Markova	Artist	http://jekmark.artstation.com

During this semester-long project, we aim to put our skills into practice and deliver a solution to our client's needs.

Responsibilities

As the designer and team leader, my main job is to make sure the user experience is at the forefront while keeping the team aligned and productive. This involves making strategic design decisions and coordinating everyone's efforts to stay focused on our project goals.

- **Gameplay Design:** I was largely responsible for the gameplay flow and feel of the game.
- **Content Implementation:** I made sure that the content systems created by our artists and engineers were implemented into the project according to the design decisions made by me and Jose.
- **Prototyping:** I was in charge of prototyping game features for testing and developing purposes.
- **Planning meetings:** I organised and led the weekly planning meetings and retrospectives and made sure everything was prepared for them.
- **Project management:** I was responsible for keeping an overview of the project and making sure everyone was focusing on the most important tasks.

Learning Goals

Here below you will find the learning goals I set for myself for this project using the SMART framework:

Learning Goal 1: Project Management

Specific: I will improve my project management skills by taking on the roles of product owner and scrum master.

Measurable: I will organize 1-hour weekly planning sessions, hold retrospective meetings with the team after each sprint, and create meeting agendas before important meetings.

Achievable: By utilizing Scrum methodologies and tools, I will consistently manage my team's workflow and improve structure.

Relevant: This goal will help me and my team gain clarity and efficiency in our project management approach.

Time-bound: I will implement this structure for a minimum of 3 months to evaluate improvement by the end of each sprint cycle.

Learning Goal 2: Game Design

Specific: I will enhance my game design skills by focusing on the empathizing and defining phases for at least two major features of the game.

Measurable: I will clearly define the design specifications of the features in a process document for each feature, alongside the rest of the process.

Achievable: This goal is achievable as it involves working directly with key features I'm responsible for.

Relevant: This process will ensure a structured approach, improving the quality of my designs.

Time-bound: I will complete the documentation and design process for these two features by the end of the current project.

Learning Goal 3: Prototyping

Specific: I will enhance my rapid prototyping skills by creating at least two prototypes, each within a 16-hour development window.

Measurable: I will define the scope, test purpose, and minimum necessary features in the process document of the feature being prototyped before beginning each prototype.

Achievable: This is achievable by allocating focused time to rapid prototyping during the project.

Relevant: This goal is important for enhancing my iterative design skills in technical skills.

Time-bound: I will create these two prototypes before the end of the current project.

Frameworks

This Devlog will detail my contribution towards creating this solution by going over our process for each phase of the development cycle: concept, design, production & testing phase. The Double Diamond Design Thinking Model was used as a framework throughout the phases and the whole project for delivering the best results possible.

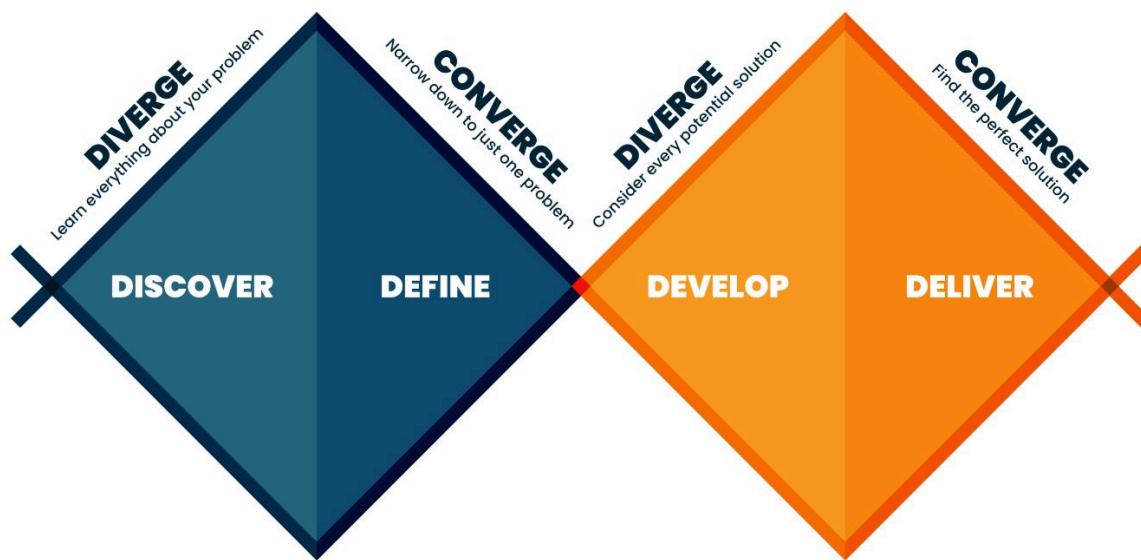


Figure 1. A diagram of the Double Diamond Design Thinking model

The Double Diamond Design Model is a framework for creative problem-solving, divided into two phases: Discover and Define (divergent and convergent thinking for understanding and framing the problem) and Develop and Deliver (divergent and convergent thinking for ideating and implementing solutions). It helps teams explore a wide range of ideas before narrowing down to the best solutions. Applications include product design, UX/UI, and game development, where clear problem definition and iterative solution testing are crucial ([Source](#)).

Concept Phase

In this phase, our goal is to set the stage for the project by really understanding the problem, refining our focus, and laying down a solid foundation that aligns with both our client's vision and our target audience's needs. This means diving deep into research, defining our approach, and setting a clear design direction to guide us as we move forward.

Research

At this point in the double diamond process, our aim is to cast a wide net and gather insights on various topics related to the project. Since our main audience is kids aged 5-10, we dug into online research to understand how they think and engage with games. We looked at their learning preferences, attention spans, and what game features work best for this age group. We compiled summaries of our findings in a research document which the whole team is able to access with the sources included.

To get firsthand insights, we also planned interviews with kids from a local school in Enschede. We wanted to hear directly from them to help shape our design choices. Unfortunately, some communication delays meant we couldn't get these interviews done before the concept phase wrapped up, but they're still on the schedule, and we're hopeful they'll provide valuable insights later on.

Because our game is educational, I also dove into the theory behind educational game design. This helped us understand how to create learning experiences that are both effective and fun. We gathered some key insights on what works well in educational games for kids and how to keep them engaged while they learn.

All this research is available in [Appendix A](#) at the bottom of this document.

Key Takeaways on Young Kids as a Target Audience for Games:

- Young kids respond well to bright visuals and hands-on, interactive elements.
- Simple instructions and immediate feedback help reinforce learning.
- Short attention spans mean we need to keep things dynamic to hold their interest.
- Social features, like multiplayer or collaborative elements, can be great for engagement, as kids this age are naturally social.

Key Takeaways on Designing Educational Games for Young Kids:

- Gradually introducing new concepts helps kids build on what they already know.
- Positive reinforcement, like rewards, keeps kids motivated and gives them a sense of accomplishment.
- It's crucial to integrate educational goals directly into the game mechanics so that learning feels natural, not tacked on.

Definition

Project Criteria

Our client had already gone through a cycle to figure out the initial problem and even tested a prototype concept. With her insights and test results translated and summarised ([Appendix B](#)), I started identifying the important findings of her testing. For example, the tests concluded that the children really liked the interactivity of the environment and the minigames. This finding will provide a starting point for designing the game's concept later on in the process.

The document from our client provided a roadmap of where she had left off, which helped us see where our focus needed to shift. This step was key for understanding her initial goals and identifying areas that still needed exploration. By aligning our goals with our client's needs, we could pinpoint what was missing and where we could really make an impact.

Based on the research and Bo's documentation, I wrote out the specifications of our project in a document using the problem statement canvas as a guideline.

CONTEXT When does the problem occur? The problem occurs during school visits to the theatre for 5-10 year old children.	PROBLEM What is the root cause of the problem? The children don't retain the information and code of conduct told to them by the teachers and staff.	ALTERNATIVES What do customers do now to fix the problem? The teachers try to keep the children calm during the visit by reminding them the rules. The teachers also try to tell the children how the theatre visit will go beforehand to reduce confusion.
CUSTOMERS Who has the problem most often? The Wilminktheater staff are the ones who have to deal with the chaos of the children most often since they guide the visits for multiple different schools	EMOTIONAL IMPACT How does the customer feel? The customer feels tired and frustrated because they want to share their interest of the theatre with the children QUANTIFIABLE IMPACT What is the measurable impact (include units)? No quantifiable impacts have been considered	ALTERNATIVE SHORTCOMINGS What are the disadvantages of the alternatives? The alternatives are not effective and can be more exhausting for teachers and staff members

Figure 2. Problem Statement Canvas

Bo's documentation also provided some insight on our target audiences. Through this information and our own research, we filled in some empathy maps to have an overview of our target audiences' situations:

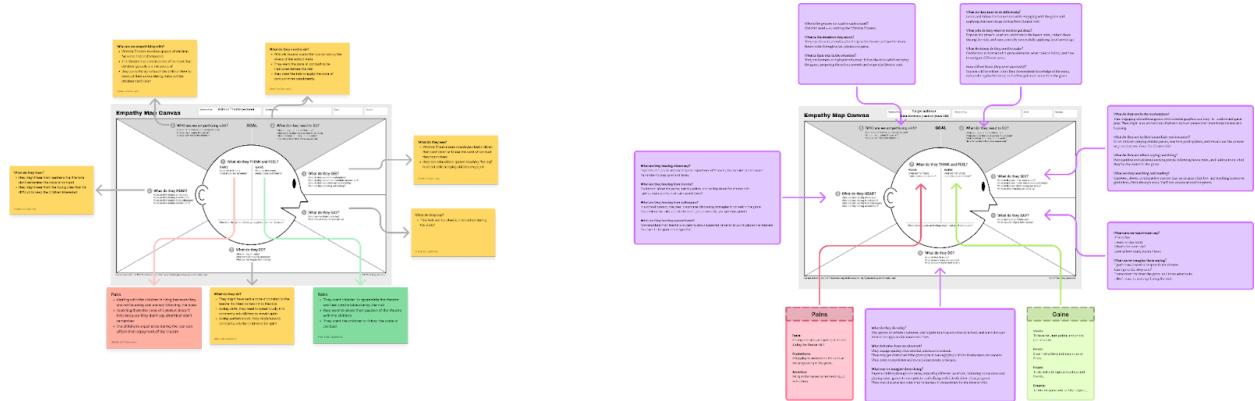


Figure 3. Empathy Maps of children aged 5-10 and Wilminktheater staff

All this information was put together into a project definition document which you can find in [Appendix C](#).

Design pillars, Game Loops & Player Motivations

One of the most important tasks as designers in the Define phase of the Double Diamond model was to get a game design document started by filling out the following three documents: Design pillars, Game Loops and Player Motivations. This is based on a game design document template made by Rosa Carbo-Mascarell. By filling out the information on these three templates, it will give us a solid foundation for designing the game's overall concept and its features.

With our project requirements defined, Jose and I began defining the overall design direction for the project through game pillars. Through meetings, we abstracted the most important goals the game is trying achieve based on the project definition document created earlier:

1. Engaging and Age-Appropriate Learning: Making sure the content is both fun and accessible for young kids. We want them to feel challenged but also capable.
2. Interactive Exploration: Letting kids explore and discover at their own pace, which encourages curiosity and gives them a sense of control.
3. Playful and Educational Challenges: Mixing play with learning to create challenges that promote problem-solving and critical thinking in a fun way.

These pillars serve as a reference point to keep us on track when designing the game concept and its features. Game pillars being a very important aspect of developing a game is something I learned about throughout my previous internships. They will serve as a reminder of our vision for the game as we start getting into the specific features by making sure each feature serves at least one pillar.

Along with the design pillars, we also drafted some basic game loops to have an overview of how we will need to keep our players engaged. These loops will get further refined as we enter the design phase.

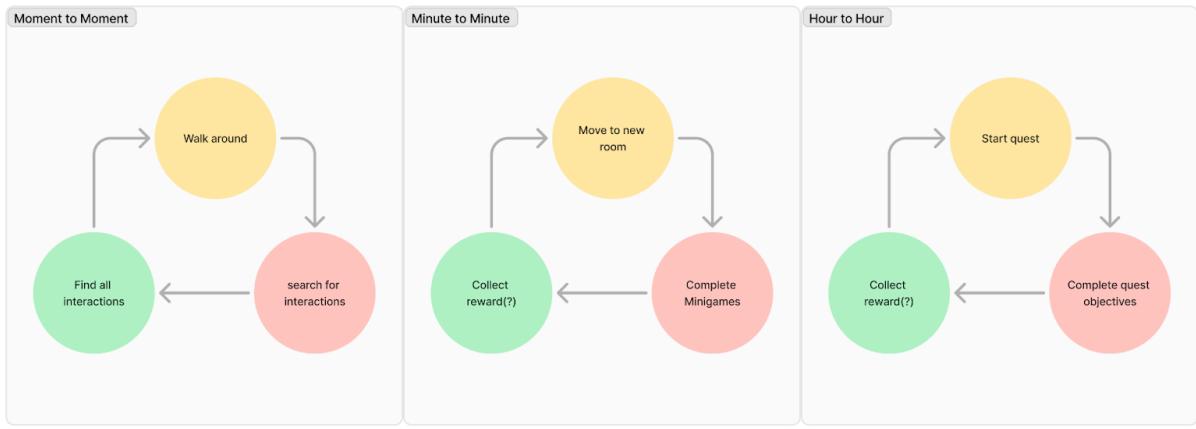


Figure 4. Basic Game Loops Diagram

The player motivations page was filled out later in the project due to difficulties with setting up an interview session with a school in Enschede. I collaborated with Jose and Thomas on creating a questionnaire to get first hand insights on our target audience. The questionnaire was handed out to a class of 15-25 kids of each age between ages 5-10 years old. The questions were aiming to understand our target audience's relation with games and what they find interesting or boring in them if they play any. The questionnaire also asked questions about the children's personal interests at school and outside of school as they can help us understand the player's motivations beyond games.

The key findings from this questionnaire were the importance of customisation, social interaction, and engaging progression systems in creating an appealing game for our target audience (5 - 10 years old). More information is available in [Appendix D](#), where the player motivations document can be found.

Outcomes

At this point in the double diamond process, we diverged to discover the problem space and then converged to define and bring together all the insights into a new problem statement from the one our client came to us with. The insights we gathered from our research and empathizing will allow us to come up with a range of solutions that fit the requirements we defined in the definition phase.

Next, we'll diverge again to brainstorm game ideas, then converge on the ones that seem most promising. This will lead us to a vertical slice of the game—a kind of functional prototype focused on the main gameplay elements.

In the next phase, I'll be working on game mechanics that align with our design pillars and game loops. It'll be a lot of testing and refining to make sure everything we build serves our educational goals and keeps our target audience engaged.

By the end of this design phase we aim to have a defined direction for our design and a game plan for the next steps. As we continue to gather feedback and test our ideas, this foundation will help us bring the project to life.

Design Phase

The main goal of the design phase was to develop Bo's initial concept of the game into a more concrete game. We started by brainstorming ideas for game mechanics that could meet the specifications defined earlier in the project. After we had a list of promising ideas, we moved forward with prototyping and testing to see which mechanics worked best. This approach was key to transforming big ideas into practical, engaging gameplay elements.

While this phase is about considering the whole game's concept, certain mechanics were specific to the venues. For these mechanics, we decided to prioritize the Main Theatre venue because we would later turn it into a vertical slice of the game.

Before discussing my contributions and the design choices made during this phase, I will go over the game concept. This was the outcome of the design phase, but explaining it first will make discussing my design decisions easier.

The Game Concept

Using the ideas from the brainstorm sessions during the diverging of the design phase, we were able to converge back to identify a structure for our game.

Using the character customization screen, the player will first customize their character before jumping into the game. The game is split into 4 levels representing the venues for the Wilminktheater, which will be accessed from the main scene representing the main square of Enschede. Each level will have the same, independent gameplay loops to allow the player to play any of the levels in the order that suits them.

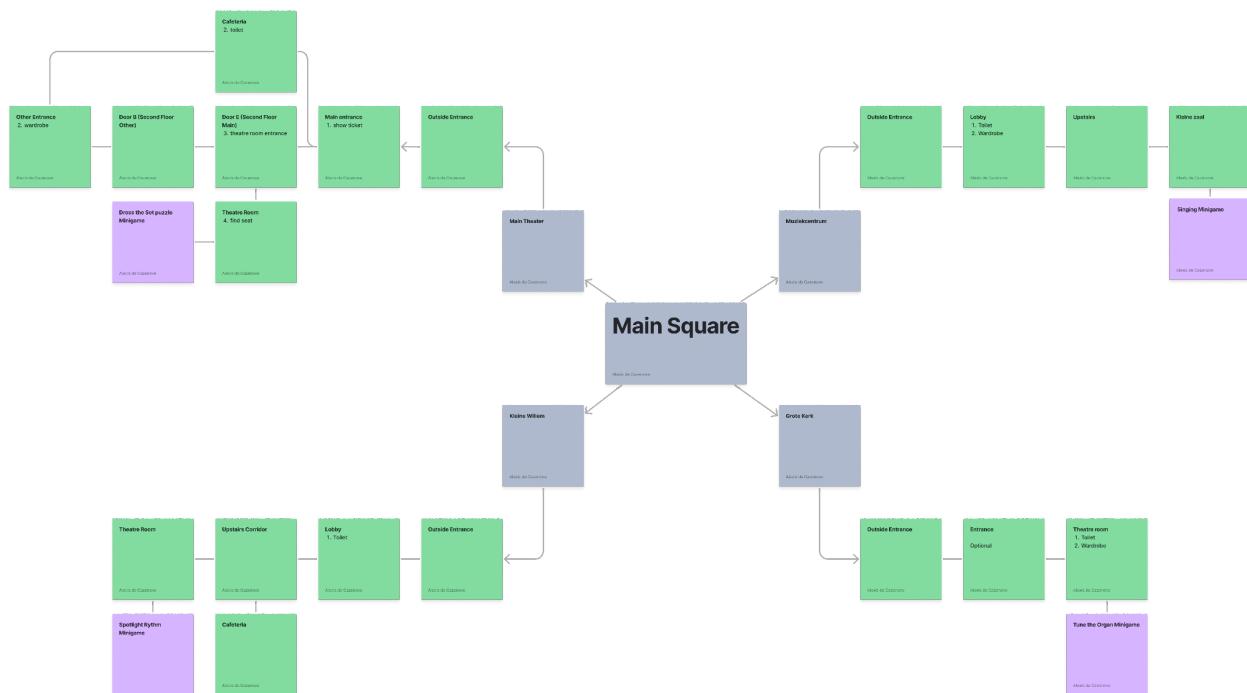


Figure 5. Flowchart of game concept with scenes in each location(green) and minigames(purple)

In each level, the player will have to complete the same tasks across the venue before being allowed into the theatre room, which is done through the task list mechanic.

While exploring the level to complete the task list, the player will also get to interact with environmental interactions and NPCs which will add additional flavour to the gameplay and make the world feel more alive. Interacting with NPCs can reward the player with special character customization options that they can adjust while playing.

Once the task list has been completed, the player will be able to access the theatre room and play the minigame themed around the venue they just completed. Based on the player's performance, the game will award a unique player customization option.

Concept Adjustments

We started off the design phase by taking a look at Bo's original concept prototype and analysing its strengths and weaknesses based on the criteria defined in the concept phase. Overall, we determined that Bo's prototype was going in the right direction but we identified two issues that needed to be adjusted.



Figure 6. Image of Bo's prototype

The first issue that needed to be addressed was the perspective of the player. In the prototype, the player has a first person perspective. This makes sense for immersion, but we realised it limited our capacity to map out most of the venues. This was an important aspect of the project specifications as one of the project's goals was to familiarize the target audience with the venues. Having a first person perspective meant we could only approach each scene from one point of view at a time since we were working with 2D artists. This also meant that exploration

within the game would be very limited, which is an important player motivation for our target audience.

Therefore, we decided to change the perspective of the game to third person. This would allow us to represent the player as a character that can move around a scene that could encompass more than just the field of view of the person. Having a fully visible character also allowed us to introduce player customization, which is another key player motivator, in a more intuitive way. Design wise, this decision also would give the player more immediate interactivity to play around with which we hypothesized would be important in retaining player attention in a younger audience.

This change introduced another issue relating to composing environments in this new perspective. The game now has a movable character that can walk around a scene that looks 3D, but our artists (almost) exclusively work in 2D. A 3D scene would offer a changing depth as the player character moves closer or further from the camera.

Two options were considered as a solution to this issue:

1. Use Unity2D and create a fake sense of 3rd perspective using systems programmed by our engineers that would alter the player character's size and speed based on their distance from the camera.
2. Use Unity3D and create our game around the concept of 2.5D, which uses 2D assets in a 3D space. The idea would be to create a 2D background with everything in the scene except for objects that needed to be closer to the camera. An invisible floor would be modeled to match the one in the background which would allow the player to walk around using a pathfinding system. Objects could be placed closer to the camera to create a fake sense of depth.

While both options were reasonable solutions to the problem, the team opted for option 2. Our engineers argued that most of the work required to achieve option 1 would be fixed by simply having access to all three dimensions like in option 2. A lot of this decision was up to the engineers since the artists' and designers' work wasn't really impacted by this decision.

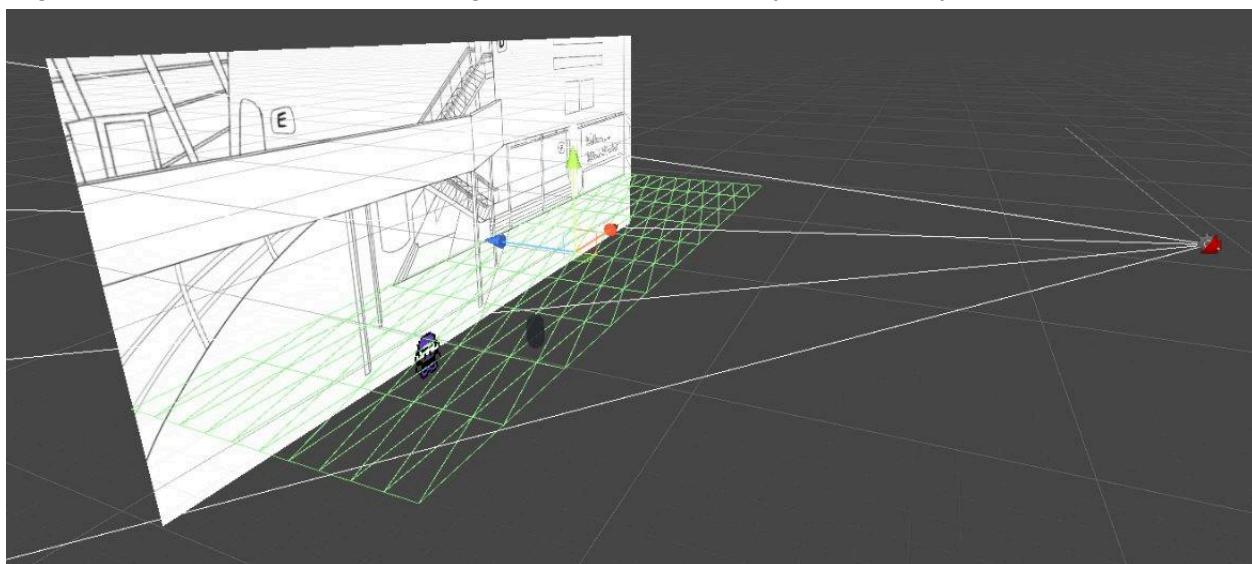


Figure 7. Test implementation of 2.5D scene

However, as the project went on and I prototyped the implementation of the game's contents into the Unity project, we started encountering issues with our chosen solution. We ended up having to switch the camera to orthographic mode due to issues it was causing with the perspective of objects that were not part of the background. This meant we needed to implement the character size and speed adjustment systems discussed on option 1 earlier. We decided to stick to 3D however because the engineers already implemented a lot of systems in the project. While this wasn't ideal, it didn't set the project back in any major way.

Game Mechanics & Features

To figure out the core structure of the game, Jose and I brainstormed to identify the game mechanics and features we would need to fulfill each time scale of the gameplay loops. This idea is based on the gamedesignskills.com page on gameplay loops. We approached the brainstorm session by creating sections for each time scale: Day-to-day, hour-to-hour, minute-to-minute and moment-to-moment. By coming up with game mechanic ideas for each time scale, we could make sure that the game would flow nicely. It's important to keep in mind that the names of the time scales don't have to represent exactly that time scale, but rather indicate the largest time scale for the game down to the smallest.

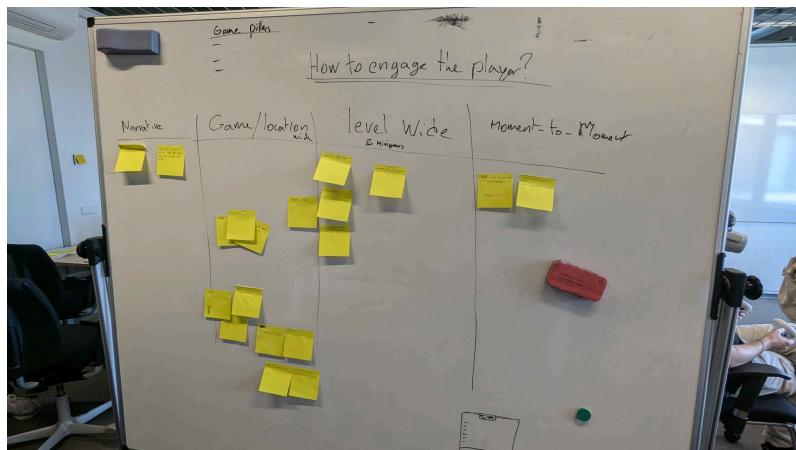


Figure 8. Game loops brainstorm board

Some mechanics, like the environment interactions and minigames, were already decided upon based on Bo's recommendations from her testing. A lot of the ideas we came up with during this brainstorm session ended up being combined together. I think that because so much of the concept had already been identified by Bo's prototype, a lot of our ideas ended up falling into place the moment we came up with them.

Here are some of the ideas we came up with:

- Moment-to-moment:
 - Moving the character
 - Clicking on interactive elements
- Minute-to-minute (level/scene wide):
 - Minigame ideas
 - Finding environmental interactions

- Interacting with NPCs
- Hour-to-hour(location/venue wide):
 - Quests
 - Making a quest system could be a good way to engage players of our age group while also introducing the code of conduct we are trying to teach them.
 - Puzzle to solve(like monkey island)
 - While this idea fit the typical point and click game, we felt like making a challenging puzzle for children of age 5-10 was too complicated.
- Day-to-day:
 - Character customization
 - Based on our questionnaire, customization is one of the key player motivators for our target audience.
 - Game wide narrative
 - Although this idea was good, it went against our requirement to have each venue be played separately from each other.

Once we identified the features we wanted in the game based on whether they fit our project requirements and our design pillars, we mapped them into our gameplay loop flowchart to visualize the game concept.

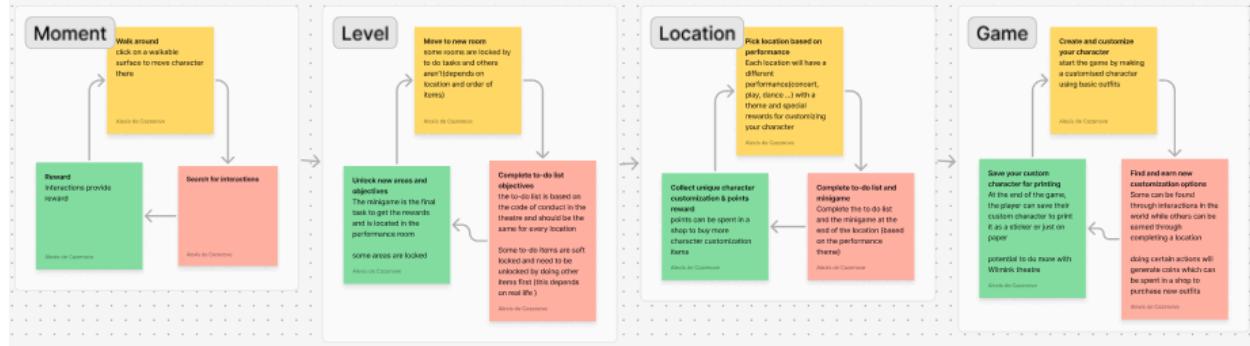


Figure 9. Game loops flowchart

Designing the Task List Mechanic

Me and Jose decided that one of the best ways to educate the children on the code of conduct at the theatre was to use the quest mechanic idea we came up with in our brainstorm session. I took on the responsibility of the design for this quest mechanic.

Based on the Double Diamond model, I first diverged through the Discover phase with the aim of understanding what the codes of conduct were that our client was trying to teach the children. Bo provided me with [this video](#) (not by the Wilminktheater) made for children that showed the code of conduct for the theatre. Based on the video, I made a list of the do's and don'ts

- List based on the video:**
- show ticket
 - Hang your jacket
 - go to the toilet
 - find your seat (no rush)
 - when it gets dark, the performance starts
- During performance:**
- switch phone to silent
 - no picture or videos
 - don't eat or drink
 - clap at the end of performance
- After performance:**
- leave room
 - pickup jacket

Alexis de Cazenove

Figure 10. List of DOs and DONTs at the theatre

Next, I converged to define the requirements for this feature by considering the list from the video, our research on learning theories and the design pillars from the concept phase. Overall, the purpose of this mechanic is to encourage the player to perform appropriate tasks before going to see a performance at the theater.

I considered the learning theories in this design process because they could be used as a foundation for how the mechanic would approach teaching the code of conduct to the player. The 2 theories I considered were the behavioural theory and the cognitive theory. The behavioural theory focuses on encouraging behaviour through active reinforcement from the game, for example by rewarding the desired behaviour or punishing the undesired behaviour. The cognitive theory creates an environment where the user/player's input creates a reaction by the game but isn't turned into a reward or punishment through the game. The player has to deduce whether their input was correct or not based on the context and their perspective.

These theories inspired two concepts for this mechanic:

- A task list highlighting exactly what the player has to do before gaining access to the theatre room.
 - Based on behavioural theory because it rewards the player for doing the expected behaviour.
 - Positives: Very clear and to the point, low chance of confusion, simple to implement
 - Negatives: very simple and could be boring
- A system which lets the environment and the NPCs react when the player interacts with things, showing positive reactions for desired behaviour and negative reactions for undesired ones.
 - Based on cognitive theories because the player isn't told out right what to do but should be able to deduce from the reactions
 - Positives: encourages critical thinking and exploration
 - Negatives: hard to implement, could be confusing for younger ages

Out of these two concepts, I believed that the task list idea would fit best with our project requirements. It would be simpler to implement compared to the other idea and it would provide the player with very clear and specific goals to achieve, which based on my research in the concept phase was best for our target audience.

Each venue will have the same list of tasks but the locations of the interactions to complete the tasks would depend on the venue. Repeating the task list throughout each level will passively reinforce the behaviour and encourage the player to explore the level/venue and familiarize themselves with the layout.

I created a Figma prototype of the Main Theatre venue with a focus on the task list mechanic using the concept sketches made by the artists. This allowed me to visualise the mechanic and potentially test my hypotheses with our target audience in a future test session.

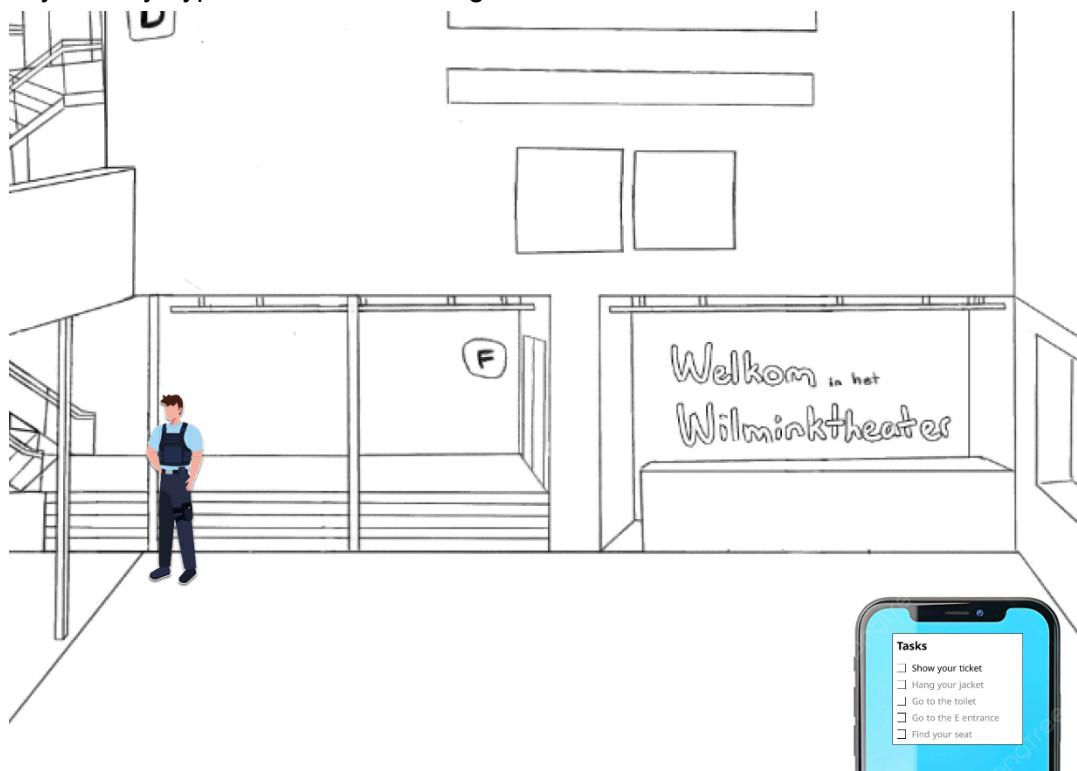


Figure 11. Lo-fi Figma prototype of main theatre

The testing never took place despite having contacted all the schools in Enschede to attempt at organising a playtest session.

While waiting, I still tested my prototype within the team and with some other designers outside of the team. The results were promising and confirmed that this would be an effective mechanic at encouraging exploration and teaching some codes of conduct to children.

Environmental Interactions

Environmental interactions have been identified as an essential part of the game's concept. These involve adding small interactive elements throughout the level to make the environment feel alive and reactive to the player's input. These interactions let players engage with various props in the theatre's venue, giving them more to explore and interact with. When clicked, an environmental interaction would play a playful sound and animation. Our clients really liked this mechanic during playtests, as it added a sense of discovery and made the setting feel more authentic.

Jose, Thomas, and I worked together to come up with ideas for these interactions specifically for the main theatre level. Thomas, as the lead artist, provided great insights on how these interactions could look visually and how they could enhance the level's mood. His artistic perspective made sure these interactions felt natural within the environment, adding to the immersion and keeping players engaged.

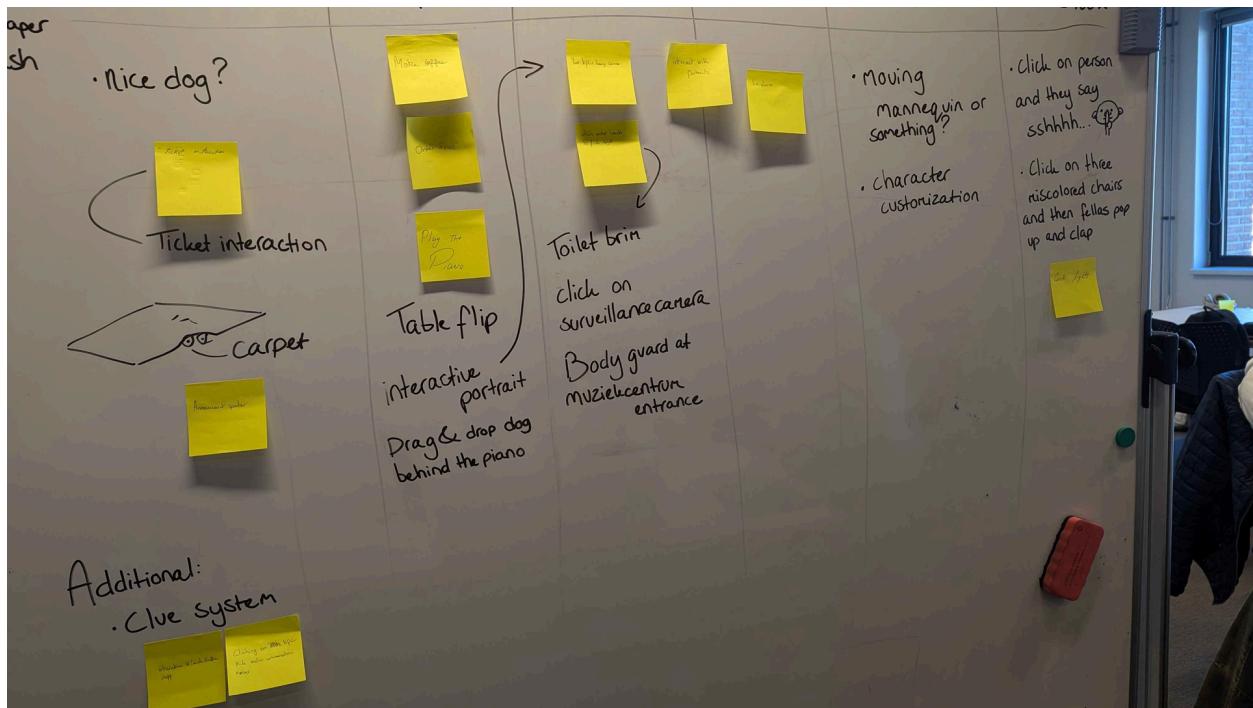


Figure 12. Brainstorm board for interactions

We organised this brainstorm session based on the Main Theatre location's scenes and came up with fun interactions that could take place in each scene based on the props in the environment. These interactions were mainly focused on the Interactive Exploration design pillar and therefore weren't required to fulfill any educational requirements.

With some ideas written down, we narrowed down our choices to 1-2 interactions per scene as we felt that more than that would be infeasible.

The chosen interactions were put in a list with a description so that our artist could start the production.

Interactions - Main theatre					
✓	Area	Description	Assigned person	Progress	Priority
✓	Bar and toilet area	Whenever players go to the cafeteria area, they can click on the piano that is located and this one will start playing a song.	Thomas	done	Must
✓	Second Entrance	Interaction 1: the TV above the wardrobe can be interactable.	Thomas	done	Must
□		Interaction 2: Light switch: Whenever the switch is clicked, a disco ball will come down. (optional)	Thomas	not started	Probably not
□		Interaction 3: Right bottom bar: Stick figure comes out and picks up food from the bar and goes away (optional) - Needs loop	Thomas	not started	Maybe later
□		Interaction 4: Whenever the clothes in the wardrobe are clicked, these ones move left and right.	Thomas	not started	Maybe later
□	Second Floor (2nd entrance)	Interaction 1: Camera above the theatre door (B). Whenever the camera is clicked, a mechanical sound will play and the camera will move.	Thomas	not started	Maybe later
✓		Interaction 2: Big poster next to entrance C. whenever it is clicked, and the person sneezes.	Thomas	done	Must
□	Theatre room	Interaction 1: NPCs on the balconies. Whenever they clicked, they will wave at you."	Thomas	not started	Maybe later
□	Main Entrance (Outside)	Interaction 1: People outside the theatre feeding pigeons Interaction 2:	Thomas	not started	Maybe later

Figure 13. List of Main Theatre interactions

Minigames

Minigames were one of the features we knew would be in the game as the children reacted very positively to them based on Bo's testing. As our game concept was starting to take shape, we still had to figure out how minigames would fit into the game flow.

I came up with an idea while working on the prototype for the task list mechanic. The task list mechanic provided a challenge to the player before they could gain access to the theatre room. However, I still hadn't figured out the reward the player would receive upon reaching the theatre room. While thinking of ways to gamify a theatre performance, I realised that it was the perfect moment to introduce a minigame.

These minigames would be fun, short, casual games inspired by the type of performances held in their respective venue. The hypothesis is that they would feel like rewards to our target audience because they would introduce a new gameplay loop for the player to explore and engage in.

Once the purpose of minigames was cemented into our game concept, me and Jose attributed the venues's minigames we would each be responsible for designing; Jose would take on the Main Theatre minigame while I would do the Kleine Willem, the Muziekcentrum and the Grote Kerk minigames.

For each minigame that I was responsible for, I worked through the phases of the double diamond model to get to the best minigame concepts possible for the venues. During the Discover phase I did some research on casual games to understand which aspects make them casual. This would allow me to set some requirements in the Define phase of the process.

I also used the Wilminktheater website to identify the types of performances that take place in each location. This inspired my ideation through the thematic of the unique aspects of the venues in the Develop phase of the model.

In the Define phase, I converged on the information gathered previously and identified the requirements for the minigame.

In the Develop phase, I ideated some concepts with the help of Jose to have a wide range of choice.

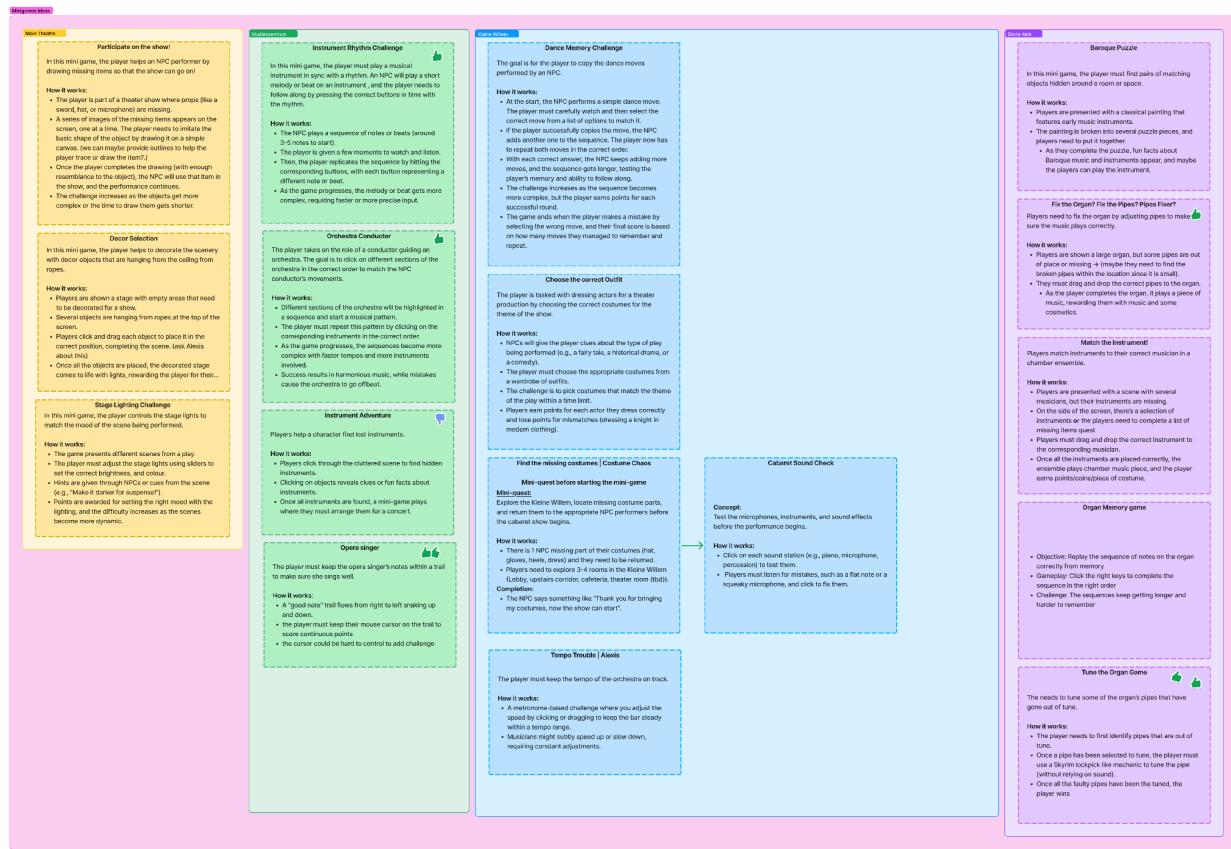


Figure 14. Ideas for minigames per location

We put all our ideas together in a diagram to have a better overview. We chose the concepts based on how unique they were in gameplay compared to other minigames and how well the thematic fit with the venue's unique aspects.

Lastly, in the Deliver phase, I prototyped the minigames for the Muziekcentrum and the Grote Kerk in Unity to polish the concept further by testing with my team and other students. Ideally, the tests would have been conducted with the target audience but it proved very difficult to achieve that.

Minigame prototype for Muziekcentrum: <https://youtu.be/WAq97yLjHvw>

Minigame Prototype for Grote Kerk: <https://youtu.be/tOr2-ZNGzAY>

You will find more details on the minigames I designed in the documentation in [Appendix E](#), [Appendix F](#) and [Appendix G](#).

These prototypes were part of my learning goals for this project, mentioned in the introduction.

Outcome

The design phase was all about turning our initial ideas into a solid, playable prototype. Through brainstorming, testing, and iteration, we refined our mechanics, adjusted the game's perspective, and developed key features like the task list, environmental interactions, and minigames.

We ran into challenges—like adapting our 2.5D approach and struggling to set up external playtests—but we found solutions and kept moving forward. Internal testing helped confirm our ideas, and prototyping allowed us to tweak things based on feedback.

Overall, this phase set a strong foundation for development, and now we're ready to bring everything to life in the next stage through a vertical slice.

Production & testing

During the Production phase, the team will focus on creating a playable vertical slice of the game concept detailed in the design phase. The Main Theatre will be the location we will use as our vertical slice because it's one of the locations most often shown to children.

Implementing Game Content

One of my key roles in the Production phase of this project was the implementation of the art content and the systems created by the artists and the engineers into our Unity project. While me and Jose were focusing on figuring out the specifics of the game, the artists and engineers were hard at work on their end to figure out how to bring our ideas to life.

For the implementation, I followed the steps of the prototype scenes I created earlier in the process to test the feasibility of the 2.5D concept.

With the finalized scene backgrounds and the layers for the foregrounds, I was able to implement all the aspects of a scene with more polish than during the design phase.

Creating these scenes involves the following steps:

- Implementing the scene background
- Adjusting the camera's maximum left and right movements based on the background
- Creating and modeling the floor using a plane and the Probuilder Unity package, so that it matches with the floor of the background
- Adding the foreground objects on the floor so that they match the background
- Adding blocker game objects around the foreground objects to block pathfinding
- Adding scene switching objects that the player can interact with to go to the next scene
- Adjusting the player character's maximum and minimum size and speed to match the scale of the background using the system built by Amber
- Adding any environmental interactables, including those for the task list
- Making sure that each scene connects correctly to the other scenes
- Making sure the player character can pathfind its way to the interactions without getting stuck

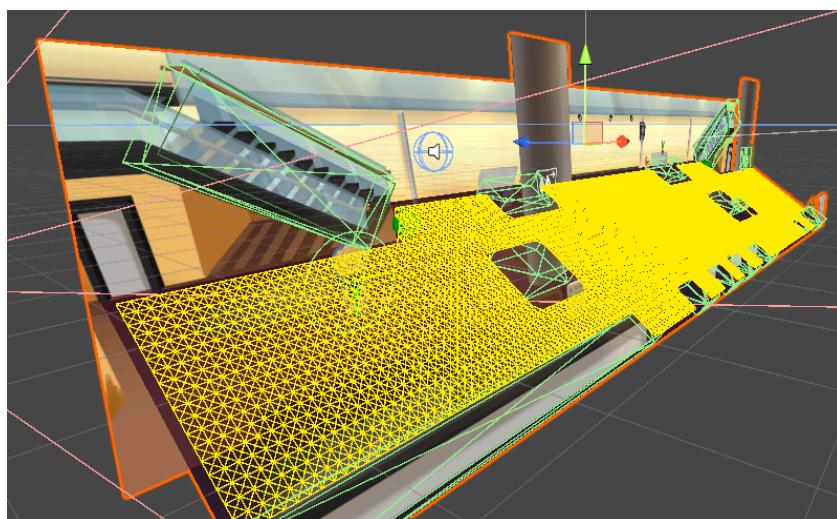


Figure 15. Cafeteria scene of main theatre in Unity

Testing

Testing is a crucial aspect of any project with a set target audience in mind. However, we have had tremendous difficulty throughout each phase of this project to organize test sessions of any kind with our children of ages 5-10. Jose, who was in charge of organising these sessions, contacted every school in Enschede multiple times throughout our project to do so. Our client also tried to contact the school she did her test sessions at but with no success. We have had to rely on feedback from our peers and on our research to make the most educated decisions we could.

Final Delivery

The result of this project is a vertical slice of the concept that was outlined in the design phase of this document. We had high expectations in thinking we could finish the whole game in the timespan given but the amount of art required was ultimately too much for 2 artists and we had to settle for a small scale version. Even then, some of the features we had planned were not fully implemented, such as the NPCs, dialogue system and the inventory system since a lot of time was spent figuring out the concept of the game. The lack of testing and feedback from our target audience did not help this either.

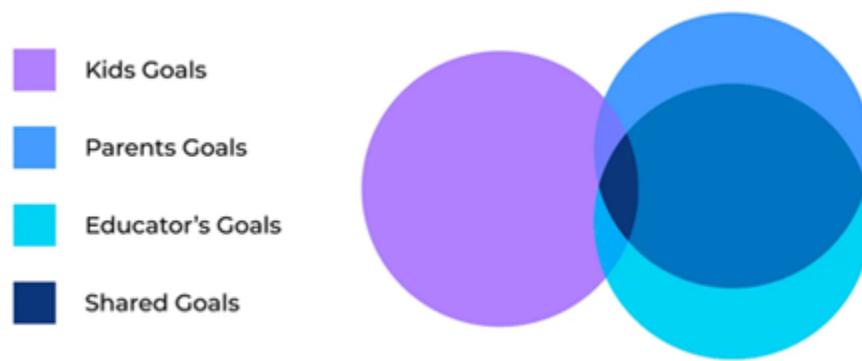
Finally, here is a link to the trailer for our project: <https://youtu.be/4D8FxZxmYI0>

Appendix A

Target audience research

Target audience: 5-10 year old Dutch primary school children

<https://medium.com/ed-tech-talks/designing-for-kids-know-your-target-audience-19fce8f24ee4>



- Kids learn faster. They think more emotionally rather than rationally, hence crafting a story in any product you design is very important.
- Different age groups would also have different needs and it is also an important step to understand how your product is going to impact every age group.
- Despite the fact that most children at this age can read, they disregard written instructions and will only read explanations if everything else fails. Limit your writing and stay away from content-heavy interfaces.
- Every time they complete a task, children expect feedback. They are more likely to act initially and see the results for themselves.
- 9-12 year olds: Their world revolves around their friendship. They spend a lot of time learning social roles and expectations. They want to be confident in their problem-solving skills.

<https://schoolofgamedesign.com/project/design-games-for-kids/>

- Think of children as adults but with a lot less experience.

<https://www.linkedin.com/advice/0/what-best-practices-designing-games-children-ne6sc>

- **Engagement and Fun:** Prioritize fun while subtly incorporating learning elements.
- **Simple, Intuitive Controls:** Ensure the game is easy to navigate with clear instructions.
- **Positive Reinforcement:** Encourage progress with rewards and feedback.

<https://gamedesignlounge.com/game-design-for-kids/>

<https://mybrightwheel.com/blog/game-based-learning>

Improves memory capacity: Games typically revolve around memorization. They require children to remember critical sequences to solve the game. Repeatedly playing these games strengthens their memorization skills.

- Game-based learning examples
 - **Red Light, Green Light:** Teaches critical thinking and patience, as children follow or stop based on the leader's movements.
 - **Hide and Seek:** Encourages problem-solving and spatial awareness when choosing hiding spots.
 - **Musical Chairs:** Develops patience and emotional management through chair competition.
 - **Simon Says:** Improves listening and attention skills by following specific commands.
 - **Hopscotch:** Navigating through squares enhances critical thinking, coordination, and shape recognition.
- **What is play-based learning?** Play-based learning recognizes that children are naturally curious and learn best through hands-on exploration and discovery.

<https://themindstudios.com/post/educational-game-development/>

One of **the best practices** is to build your game's plot around the subject being taught.

For example, you can teach kids literature by letting them adventure with historical figures or folklore characters and answer questions from bridge trolls, sphinxes, or other characters.

- **Hyper Casual Games:** One of the defining characteristics of hyper casual games is the **short length of sessions**. Kids, especially younger ones, tend to lose focus fast, and lengthy sessions with the same mechanics might bore them quickly. Short sessions combined with diverse tasks will lead kids to play and learn in a more engaged way and for longer periods of time.
 - **Timing Mechanics:**
Focuses on precise timing for rewards. The challenge is to balance difficulty—too easy and players lose interest; too hard and they get frustrated.
Game example: Fun Race 3D
 - **Agility Mechanics:**
Centres on hand-eye coordination and quick decision-making. Players dodge

obstacles and collect items, with difficulty increasing as speed and item collection rise.

Game example: Pac-Man

- **Puzzle Mechanics:**

Involves logical thinking to fit pieces into a puzzle. As pieces fall, mistakes make the game harder by reducing space and time.

Game example: Candy Crush Saga

- **Merge Mechanics:**

Combines similar items to create new rewards. The merging process should be satisfying yet simple, often continuing automatically.

Game example: Merge Mansion

- **Social Mechanics:**

Allows players to play casually, fitting in moves when convenient. Also includes watching others play via platforms like Twitch.

Game example: Words with Friends

- **Swerve Mechanics:**

Requires navigating a track or avoiding hazards, aiming to keep players engaged. More time spent can lead to greater investment in in-app purchases.

Game example: Flappy Bird

- **Incorporate Rewards and Feedback:** Children in this age group respond well to immediate rewards like badges, new in-game abilities, or simple visual cues.

Ensuring the game offers positive reinforcement keeps players motivated. For older kids, in-game currencies or leaderboards can add an extra layer of engagement

Educational Games

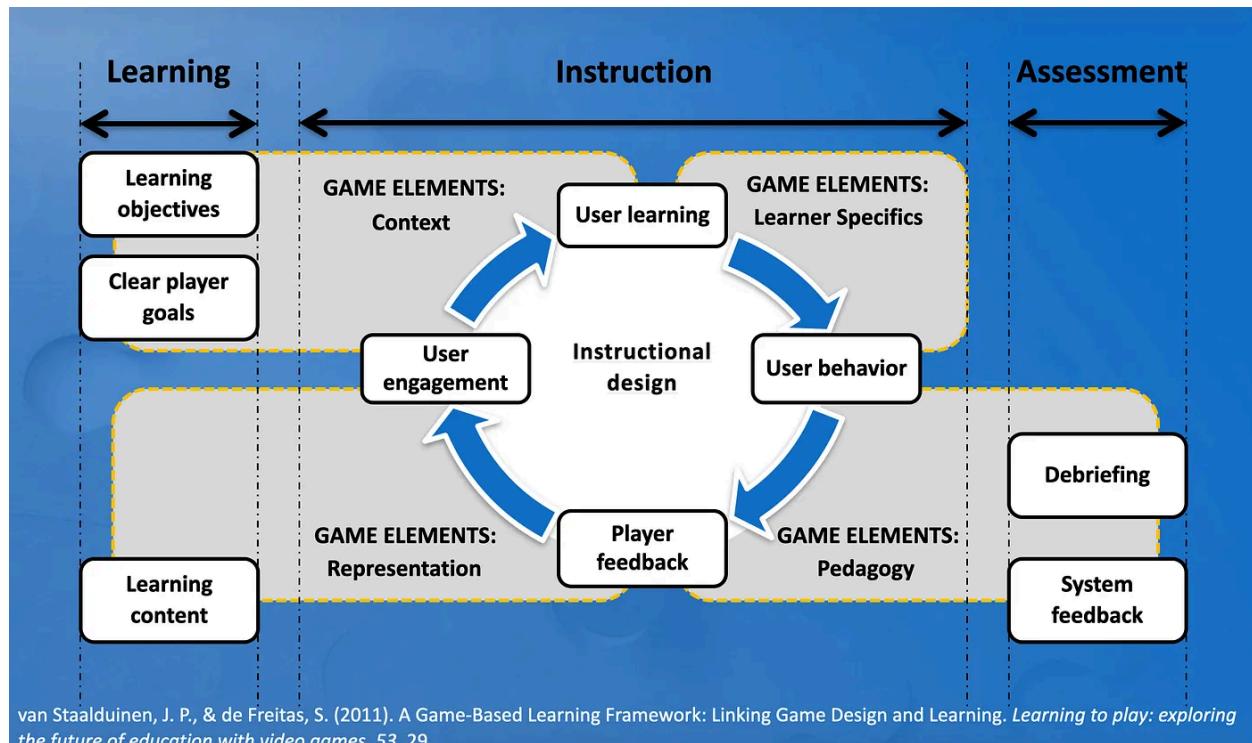
Key Benefits of Gamified Learning in the Classroom:

1. **Skill Development Beyond Academics:** Consistent use of gamified learning enhances academic skills (like math, reading, and science) and crucial social and emotional learning (SEL) skills. These include problem-solving, collaboration, behaviour management, and responsibility. Such skills extend beyond the classroom into everyday life, preparing students for real-world challenges.
2. **Increased Engagement:** Educational games boost motivation and create engaging learning experiences, resulting in better participation. Games help students form positive connections with learning, leading to improved outcomes and higher achievement.
3. **Variety of Learning Benefits:**
 - a. Motivation: Games make learning more exciting, encouraging students to engage more in class.
 - b. Improved Attention: The fast-paced nature of games helps students remain focused and attentive.
 - c. Problem-Solving: Game-based learning fosters stronger problem-solving skills through interactive and challenging activities.

- d. Language Development: Games provide rich contexts for learning new vocabulary and improving language skills.
- e. Self-Esteem: Certain video games, like Minecraft, can enhance students' self-confidence and help them feel more connected to their peers.
- f. Teamwork & Cooperation: Playing games teaches students how to work well with others, respect team roles and communicate.
- g. Memory Enhancement: Games help improve memory retention, and this benefit lasts into adulthood.
- h. Relatability: Gamified learning appeals to today's digital-native students, making the material more relatable and accessible.
- i. Resilience: Games promote learning through trial and error, encouraging perseverance and growth despite mistakes.

Educational Game Theories & Frameworks

[Pedagogy In Games Exploring the Intersection of Learning Theories and Game Theories - Medium](#)



Theories

Behaviourist theories

Behaviourism is a learning theory that emphasises the role of reinforcement in shaping behaviour.

- In game-based learning, behaviourism can be integrated through reward systems, such as points, badges, or other in-game rewards, that motivate learners to engage with the learning material.

- For example, a math game rewards players with points for answering questions correctly or completing challenges within a specific time limit.

Cognitive theories

Cognitivism emphasises the role of mental processes, such as memory, attention, and problem-solving, in learning.

- Cognitivism can be integrated through games that challenge learners to think critically, solve problems, and make decisions based on information presented in the game.
- For example, a history game that challenges players to make decisions based on historical events and information and shows the consequences of their choices in the game.

Constructivist theories

This learning theory emphasises the active role of learners in constructing their understanding of the world around them.

- Constructivism can be integrated through open-ended gameplay and exploration, allowing learners to experiment with different solutions and create their understanding of the learning material.
- A science game that allows players to explore and experiment with different scientific concepts, such as biology or physics, through sandbox-style gameplay is an example of this.

Connectivist theories

Connectionism is a learning theory that emphasises the role of technology and networks in facilitating learning.

- In game-based learning, this can be integrated through multiplayer games, social features, and online communities that allow learners to connect and collaborate in learning.
- For example, a language-learning game that includes social features such as chat rooms, forums, or multiplayer challenges allows learners to practice speaking and writing with other learners.

Frameworks

Serious Games Framework

This framework is designed to help game designers create games that are not only fun but also educational. It emphasises the importance of aligning game mechanics with learning objectives and providing players opportunities to reflect on their learning. [You can learn more about serious games in our other blog.](#)

Game-based Learning Design Framework

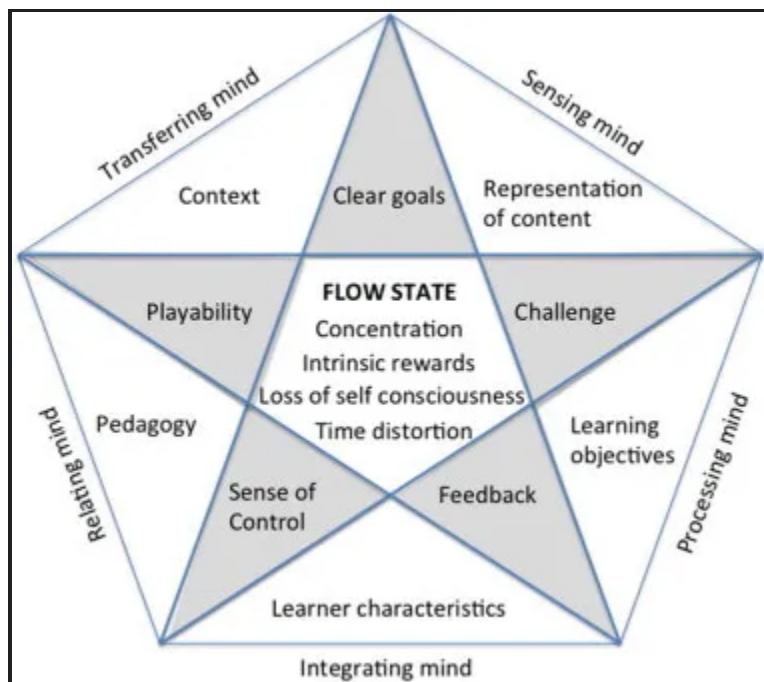
This framework is designed to help game designers create practical game-based learning experiences. It emphasises the importance of aligning game mechanics with learning objectives and providing players opportunities to practice and apply new skills and knowledge.

Situated Learning Framework

This framework is designed to help game designers create games in authentic learning contexts. It emphasises the importance of providing players with opportunities to engage in authentic tasks.

“FLOW” framework

This emphasises the importance of creating a state of “flow” in players, fully immersed in the game and feeling a sense of control and mastery. The “FLOW” framework emphasises the importance of creating challenges that are appropriately matched to players’ abilities, providing clear feedback on progress, and creating a sense of engagement and enjoyment in the game. In addition to these frameworks, there are many other approaches to designing learning games, such as problem-based, inquiry-based, and project-based learning. Each approach has unique strengths and can be used to create compelling games for different learning objectives and student populations.



School system in the Netherlands

The Dutch education system is organized into eight grades called groepen.

- Groep 1: Age 4 (not compulsory but most children start at this age)
- Groep 2: Age 5 (school attendance becomes compulsory)
- Groep 3: Children begin formal learning in reading, writing, and arithmetic
- Groep 4: Age 7
- Groep 5: Age 8
- Groep 6: Age 9

- Groep 7: Age 10 (English is introduced in most schools)

Educational video games are used to teach and engage students across different groups (groepen).

For Groep 1 & 2 (Ages 4-5):

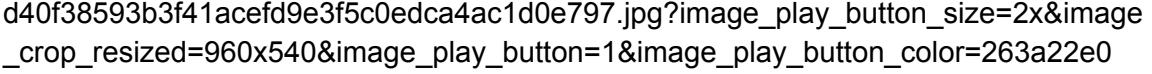
- [Squila](#): Squila provides interactive quizzes and games for early learners, covering math, language, and general knowledge

Going to school with confidence

Could your child use some extra practice? On Squila, your child can practice at their own pace. Your child can simply retake any questions they answered incorrectly at the end of the quiz. If your child answers the question correctly, they will also be rewarded. That gives [self-confidence!](#)

- Retake any questions they answered incorrectly at the end of the quiz.
- [Werkbladen](#)
- [Gynzy](#): offers digital whiteboard tools and interactive games, supporting early learning in subjects like math and language.
- [Kleutergames](#): Focused on preschool children, Kleutergames enhances basic cognitive skills, hand-eye coordination, and problem-solving.
- [Dragonbox Math Apps - Empower Kids!](#)

For Groep 3-4 (Ages 6-7):

- [Rekentuin](#): A math-focused platform where students practice arithmetic in a fun, garden-themed environment. It adapts to individual progress.
- [Ambrasoft](#): Ambrasoft offers games to support Dutch language learning and basic math skills, tailored to younger children.
- [Dragonbox Math Apps - Empower Kids!](#)
- Open 
- [6 Kid-Friendly Alternatives to Hangman to Play in Your Classroom | Teach Starter](#)

For Groep 5-6 (Ages 8-9):

- [Tynker](#): A platform to teach coding through interactive games, introducing logical thinking and computational skills.
- [Kahoot!](#): Quiz-based games for engaging learning across subjects like math, history, and languages.
- [Dragonbox Math Apps - Empower Kids!](#)

For Groep 7-8 (Ages 10-12):

- [DragonBox](#): A math game teaching algebra through visual puzzles and engaging tasks.

- [Blooket](#): A quiz-style platform with fun themes for teaching subjects like math, English, and science.
- [Dragonbox Math Apps - Empower Kids!](#)

Website with some game suggestions:

- <https://www.teachstarter.com/gb/blog/11-benefits-of-playing-games-in-the-classroom-resources-included/>

Educational Game Pacing Theory

Prodigy Math Game

[Prodigy Math - Youtube Video](#)

Overview

- Prodigy math games mainly uses combat and the acquisition of resources like mana as a form of encouragement to make kids do certain math assignments.
- The general concept of the game is similar to an MMO
 - the player can progress their character by acquiring new gear and leveling up through quests and battles with monsters
 - The players can also fight each other
- The game features 2 modes:
 - **School mode** allows teachers to create their own math assignments and only lets players play the specific aspects of the game involving the assignments (stripping the MMO part of the game)
 - **At Home mode** allows the player to play the full version of the game

Educational Aspect

- The player enters combat with no mana to attack their opponent
 - They have to spend a turn on doing a math exercise to generate mana
 - If they succeed they generate mana points which can be used to cast spells
 - most battles will require multiple mana recharges to win, and therefore multiple exercises

Pacing

Overall, the game uses tried and tested MMO features to maintain engagement over longer terms to encourage the players to regularly battle monsters, and therefore practice their math skills.

The overall game focuses more on the fun and engaging parts such as the character progression while placing the math assignments in the part of the game that the player has to go through to further progress (combat).

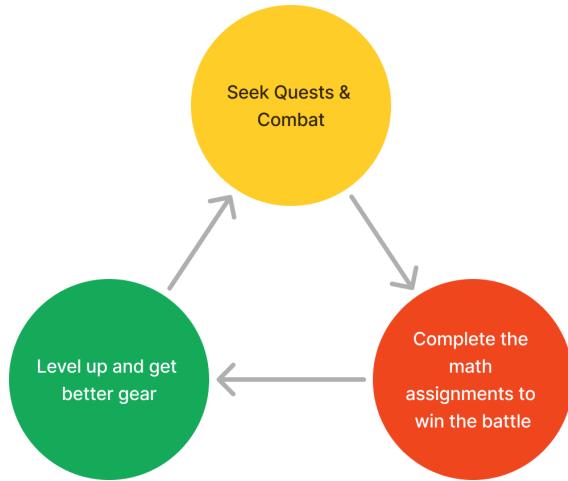


Diagram showcasing game loop

Using “for fun” game mechanics inspired by MMOs as a reward/motivator to get through the combat/math exercises makes the game seem less like an educational game to kids and more like a “real” game.

An important aspect in this pacing is to not make the game about the math assignments as a game mechanic but rather to have them as a challenge that needs to be completed to continue playing the game.

This game is an example of applying Behaviourist theory

Prodigy English Game

[Prodigy English Game - Youtube Video](#)

Similar to Prodigy Math Game but uses a different game genre, namely a sandbox crafting game, but the pacing is the same.

Dragonbox Games

[Dragonbox Math Apps - Empower Kids!](#)

DragonBox is an award-winning series of educational math apps that are designed to engage and excite children about learning.

Overview

Dragonbox games is a group of games/environments which help kids understand various mathematical concepts to different degrees of complexity depending on their age. The games make use of different approaches when it comes to teaching their respective mathematical topic.

The 2 approaches I've observed are:

- Cognitive/constructive approach using metaphorical/analogical teaching - This approach involves transforming the theory into more relatable concepts and interactions
- Behavioural reinforcement - This approach involves teaching the material as is but motivating the player to complete the challenges by rewarding them with narrative progression or “for-fun” gameplay.

The following games from Dragonbox are examples of these strategies.

DragonBox Numbers - Learn Number Sense

Numbers is an app that helps young children build a number sense. The app uses metaphorical representations of numbers from 1-10 called Nooms, which are fluffy columns whose length depends on the number they represent. These Nooms are used throughout the app to help kids visualise their respective numbers. Numbers includes various environments that help the kids improve their number sense with the Nooms through different approaches:

- A sandbox environment where kids can add, subtract, compare Nooms and visualise the rules of numbers.
- 4 games which reinforce the rules of numbers through gameplay.

This game uses both cognitive and constructive theories in its approach to teaching number sense.

DragonBox Elements - Geometry App

Elements is a game about learning the theory of geometry through a narrative puzzle experience. The goal of the game is simple - build an army to defeat the evil dragon, Osgard. Behind each level are the properties of shapes, with each move you are interacting with geometric proofs.

This game is an example of the application of cognitive theory. While the game does reward the player for finding the correct solution, its main purpose is not necessarily to reinforce behaviour. Rather, it is used as feedback to communicate to the player that they have completed the puzzle and found the solution. The game doesn't seek to teach a known behaviour; it seeks to encourage the child to think critically and apply the theory they have learned as a way to get to the correct solution.

6 Year Old Games on COKOGAMES

Appendix B

Bo's Translated Summary of Graduation Paper

Abstract

This project explores how to make the current teaching materials used to introduce schools to the Wilminktheater more engaging and playful, to help children retain theatre rules and information more effectively. By making these materials interactive, the theatre aims to reduce the chaos that often occurs before school performances. Several tests were conducted during this project, including:

- Identifying art styles that appeal to the target audience.
- Designing a virtual theatre tour using Figma.
- Developing an interactive tour with animations and sound effects in Scratch.

The research concludes that teaching materials are significantly more effective when presented playfully and interactively. Educational games with sufficient interactive elements generate enthusiasm and allow children to absorb information more effectively than traditional methods. This project was created as part of a graduation project for the Creative Media and Game Technologies program at Saxion University of Applied Sciences in Enschede. The work was carried out at Wilminktheater and Muziekcentrum Enschede, and information was gathered through interviews, observations, and online research. Prototypes were also tested with target users.

Final Problem Statement

The current teaching materials provided by theatres to schools before performances are often not fully covered by teachers, resulting in a lack of student engagement. This leads to unrest and chaos during theatre visits. The Wilminktheater seeks to develop a playful, flexible solution in the form of a game that can be used both with and without a teacher. The game should keep students engaged while ensuring that theatre rules are clear and retained after gameplay.

User Interface Design

The game's buttons were designed using Adobe Illustrator to align with Wilminktheater's new brand identity, which includes a stylesheet featuring the colors black, white, red (#E42313), and purple (#6C217E), and the fonts Brandon Grotesque and Myriad Pro. Purple buttons with black or white outlines were chosen based on the background color to ensure high visibility. Since the theatre interior contains a lot of red, purple buttons were selected for contrast, and Brandon Grotesque was chosen for its playful style (Figure 5).

The buttons were designed to be intuitive for the target audience, with clear visual cues to indicate clickable areas. A strong color contrast ensures that buttons stand out in the game, and

simple animations paired with sound effects enhance the interactive experience, providing feedback when a button is pressed (Erbis, 2023).

These design decisions were approved by the Wilminktheater, with input from Marieke Bakker (personal communication). At the theatre's request, square buttons with rounded corners were used, as this shape best reflects their brand identity. Below is an example of different button versions presented to the theatre for approval.

1. Test Phase

1.1 User and Usability Testing - Target Audience**

During the prototype testing phase at the Alfonsusschool in Enschede, valuable feedback was gathered from a 6th-grade class. While this group was not initially the target audience, the age group aligned well with the project. This class, consisting of children around 9 or 10 years old, was divided into three groups of three children. The test lasted about an hour in total. Both a user test and a usability test were conducted.

User Test Results

- Goal: Understand how children experience the game and how it helps them learn about the theatre and its rules.
- User Feedback
- Positive Game Experience
- Interaction: The children enjoyed small interactions, such as flushing the toilet and turning lights on and off.
- Mini-games: The instrument mini-game was a favourite due to the sounds played with each click. They expressed a desire for more mini-games, like recording and playing back concerts or staging performances (e.g., Hans Klok at the Wilminktheater).
- Learning Effect: The children reported that the game helped them learn their way around the theatre and remember the rules. They could easily recall the rules embedded in the game.
- Preference Over Presentation: Compared to a traditional presentation, the children found the game more enjoyable and engaging, preferring this format for future preparations.
- Independence: They appreciated being able to play the game at their own pace and order, giving them a sense of freedom.
- Recognition: The game's style was well-received, with children familiar with the Wilminktheater recognizing the location in the drawings.

Suggestions for Improvement:

- Add more interactions, such as flushing the toilet and engaging with the audience.
- Integrate more sounds and elements, such as a stage mini-game and a catering mini-game.
- Allow sitting on chairs in the auditorium or foyer.
- Include a shop where points can be spent.

- Add visual cues, like outlines around clickable points, and make it clearer that characters can be clicked.
- Allow objects to be dragged and instruments to resize upon interaction.
- Slow down the automatic text display.

Usability Test Results

Goal: To assess how user-friendly and intuitive the game is for children.

User Feedback

Ease of Use

- Navigation & Interaction: Children found the game easy to navigate, but clearer clickable areas could improve interaction.
- Text Speed: The automatic text moved too quickly for some children, and slowing it down would enhance comprehension.
- Visual Feedback: Outlining clickable areas and providing clearer indications when characters are clickable would improve the user experience.

Suggestions for Improvement

- Increased Interactivity: Add more interactive features such as flushing toilets, sitting in chairs, and creating an audience in the game.
- Enhanced Sounds & Visual Effects: Introduce more characters, sounds, and objects to make the game feel livelier.
- New Mini-Games: Consider adding mini-games, such as a stage performance game, a catering challenge, and a shop where points can be spent.
- Object Interaction: Enable players to drag and resize objects within the game.
- Adjusted Text Speed: Slow down the automatic text to make reading and understanding easier for children.

Overall Conclusion

The game offers a fun, engaging way for children to learn about theatre etiquette and remember important rules. By enhancing visual feedback and adding more interactive elements, the overall usability and enjoyment could be significantly improved.

Usability Test - Wilminktheater Employees

A usability test was conducted with several employees from various departments at the Wilminktheater (Appendix 4). Participants engaged with the game and completed a follow-up questionnaire. The purpose of this test was to gather insights into how different departments perceive the concept and its potential value for theatre staff.

Summary of Questionnaire Results

User Interface

- Positives: Clear and easy to navigate.
- Suggestions for Improvement: Ensure consistency in formality and symbols across the app.

Game Style

- Positives: Aligns well with the Wilminktheater's brand.
- Suggestions for Improvement: Incorporate more vibrant colors to enhance the experience.

Child Interaction

- Positives: Adequate level of interactivity.
- Suggestions for Improvement: Add more interactive elements and mini-games to increase engagement.

Use in Theater

- Positives: Suitable for a broad audience, including public use.
- Suggestions for Improvement: Position the game as a tool to prepare children for theatre visits, especially for children's performances.

Game-Learning Balance

- Positives: Good balance between fun and education.
- Suggestions for Improvement: Include more educational content while maintaining room for enjoyable game elements.

Impact on Young Audiences

- Positives: Helps make theatre visits less intimidating and boosts excitement.
- Suggestions for Improvement: Introduce recognizable theatre characters, such as staff members, to increase familiarity.

Effectiveness as a Learning Tool

- Positives: A valuable way to educate children about theatre.
- Suggestions for Improvement: Continue adapting to digital learning trends and environments.

Specific Ideas and Recommendations

- Additional Features: Introduce fun elements like light switches and interactive "occupied" toilet signs.
- Mini-games: Consider adding games such as collecting musical notes or making drinks at the theatre bar.
- Language Simplification: Use straightforward language with concise, clear sentences.
- Quizzes: Incorporate location-based quizzes to enhance learning.
- These recommendations aim to further enhance the app's usability and educational value, making it a practical and engaging tool for the Wilminktheater.

Discussion and Recommendations

Website Integration

During this project, it became evident that transforming educational content into an interactive game is full of possibilities, with the current concept representing only the beginning. A game focused on the Wilminktheater could be a valuable resource not only for schools but for children in general. It could be integrated into the theatre's website, particularly under the section for children's performances. This would allow both schools and parents with children to use it as a preparation tool before attending a performance.

Potential Future Enhancements

To increase engagement, additional interactive features and mini-games should be incorporated. Introducing a point system with a shop, where players can spend their earned points, would encourage repeat play, making it useful for schools to review theatre rules before visits. Future development of the game could continue using Scratch, but if the game is integrated into the website, converting the code to JavaScript is recommended. There are existing tools that allow for this transition, as discussed in the Scratch forums (Scratch - Imagine, Program, Share, n.d.). While Scratch offers a simple platform for coding, someone with a solid knowledge of JavaScript could rewrite the code to ensure it runs without issues.

Further Research

Given that the project lasted only six months, certain areas were not fully explored or tested with the target audience. For example, the chosen art style may not be the most effective for the target group, as feedback was gathered from only six users. Additionally, the prototype only covered one of the four Wilminktheater locations; ideally, all four locations should have been represented. The development of mini-games was also limited due to time constraints, so their potential remains largely untapped. Children in the test group frequently mentioned the inclusion of a point system as a motivating factor for replaying the game, highlighting the importance of such features in future iterations.

Appendix C

Project Definition Document

2. Introduction

The project aims to make the current teaching materials used to introduce schools to the Wilminktheater more engaging and interactive, to help children retain theatre rules and information more effectively. Traditional materials often result in low student engagement, leading to chaos during theatre visits. To address this, the Wilminktheater seeks to develop a playful, flexible game that can be used with or without a teacher. The goal is to create a fun and educational tool that keeps children engaged, ensures they remember theatre rules, and reduces disorder during school performances.

The current approach employed by the teachers and theater staff is not effective for kids to retain the information. Teachers and staff take the time before and during the school visit to explain the code of conduct to the children but due to the low engagement and the stimulation of a new environment, the information doesn't stick.

3. Problem Statement

Problem Context: children often lose focus and create chaos during theatre visits due to poor engagement with the current method of explaining the school trip rules.

Core Problem: The current method of teaching important information regarding the theater is not engaging, and children are not retaining important theatre etiquette or information.

Symptoms: Low student retention of theater rules, chaotic behavior during performances and overall visit, and teachers having a hard time keeping order.

Impact: Poor student behavior affects the theatre experience for both staff and students, can also reduce interest in the theater within children

4. Project Objective

Main Objective: Develop a 2D Point & Click game that helps children of 5-10 years old retain theatre etiquette and reduce disorder during school visits.

Key Features:

- Virtual recreation of the 4 theater venues
- Minigames
- Interactive environments

- Target Audience: 5-10 year old children, primarily in school groups, preparing for theatre visits.

5. Scope and Limitations

Scope:

- All 4 Wilminktheater locations
- Integration of brand identity
- Hosted on separate website page
- Game will be playable using only a mouse
- The game should run smoothly on personal devices including tablets/iPads

Limitations:

- Game duration needs to be flexible
- Game needs to be 2D Point&Click

6. Stakeholders

- Primary Stakeholders: Wilminktheater staff, teachers conducting the school trips, and 5-10 year old children.
- Secondary Stakeholders: school administrators, and parents.

7. Conclusion

Research question: How can we keep children aged 5-10 engaged while learning about the code of conduct for their school trips to the Wilmink theater through a 2D Point & Click game?

Appendix D

Player Motivations

Primary Motivation

Key Motivational Drivers

Creative Freedom

- Children highly value games that allow for customisation and building. The preference for creating their characters and worlds is consistently strong across groups.
- Implications for Design: Include customisation options for avatar creation.

Challenge and Progression

- Enjoyment increases with games that feature clear progression systems, such as unlocking levels, improving skills, or earning rewards.
- Implications for Design: Add challenges, unlockable content, and achievements (You have completed the Wilmink Theater area!) → Maybe I can design some badges

Action and Adventure

- Fast-paced, dynamic elements like shooting, exploring, and interacting with in-game characters are popular.
- Implications for Design: Include interactive elements like mini-quests, puzzles and interactive objects. → things we have been working on

Vibrant and Immersive Environments

- Colourful designs and diverse settings appeal to children's imaginations and keep them engaged.
- Implications for Design: Use vibrant art styles and varied environments to enhance immersion.

Progression Systems

1. Immediate Feedback

Children prefer games that provide instant gratification.

- Implementation:
 - Use visual and auditory cues for successful actions (stars, applause sounds, or sound effects in general).
 - Provide gentle encouragement or humour for mistakes (a funny sound effect from the interactable objects around the locations).

2. Clear Objectives

Players should understand what to do at all times to prevent frustration.

- Implementation:
 - Introduce clear, visual instructions before each minigame or task.
 - Use intuitive symbols or animations to guide players.

3. Milestone Rewards

Children enjoy a sense of progression and achievement.

- Implementation:
 - Reward players with collectables (badges and cosmetics) after completing tasks, a level or a mini-game.
 - Unlock visual upgrades or animations at key discoveries → NPC's saying stuff like "You've lit up the stage!" or "Good job!"

Player Segmentation Insights

Groep 4 (Ages 7–8)

Motivators: Creativity (building houses, placing blocks), simple action (shooting).

- Design Focus:
 - Introduce intuitive mechanics.
 - Include beginner-friendly challenges with immediate feedback and rewards.

Groep 5 (Ages 8–9)

Motivators: Customisation, exploration, skill mastery.

- Design Focus:
 - This group likes open-world exploration and customisation options → even though our game isn't particularly open-world, it offers a wide range of exploration among the locations and scenes.
 - Add skill-based progression (timed challenges).

Groep 6 (Ages 9–10)

Motivators: Competitive action, challenging gameplay, and vibrant designs.

- Design Focus:
 - Introduce competitive elements like leaderboards and timed events (maybe like a mini-game based on time or just a quite challenging one).
 - Incorporation of visually striking levels with diverse gameplay styles.

Boredom Mitigation Strategies

- **Avoid Repetition:** Introduce multiple challenges and dynamic levels to prevent monotony.

Conclusion

The insights from this analysis reveal the importance of customisation, social interaction, and engaging progression systems in creating an appealing game for our target audience (5 - 10 years old). By aligning game mechanics with these motivations and designing great progression

features, the game can provide a rich, enjoyable experience that keeps our target audience engaged.

Appendix E

Main Theatre Minigame Concept Overview

Game Title: Dress the Set

Core Concept:

The player will have to perfectly fit a certain number of set decor pieces into a tile grid by rotating, dragging and dropping them in the correct place. The decor pieces are shapes made of tiles like on the grid and when the player solves the puzzle, the decor pieces would be dropped down from the ceiling.

Genre:

Puzzle



Figure 20.



Figure 21.

Key Elements

Core Gameplay Loop:

- Actions: Rotate, drag and drop the puzzle pieces on the grid.
- Challenges: Finding the right solution in the least amount of moves
- Rewards: Earn points based on how many moves it took to find the solution, number of points turn to stars when certain thresholds are reached.

Unique Selling Point (USP):

This concept works very well with the unique aspect of the main theatre's set decor system and provides a unique game concept for the minigames.

Target Audience:

Children aged 5-10 who are going to visit the main theatre

Platform:

PC, Tablet

Scope & Vision

Visual/Art Style:

Stylized realism

Audio Style:

Light hearted and simple

Estimated Scope:

Minigame, 5 min max gameplay time

Narrative Hook (Optional):

A theatre performance is about to start and the player is in charge of the decor

Appendix F

Muziekcentrum Minigame Concept Overview

Game Title:

Keep Singer's Pitch

Core Concept:

The player needs to help the singer maintain their pitch by keeping their mouse cursor on a line that is moving across the screen and undulating up and down. The player earns points based on how close the cursor is to the center and can get multipliers when uninterrupted.

Genre:

Casual Game



Figure 22.

Key Elements

Core Gameplay Loop:

- Actions: Move the mouse cursor up and down to keep it on the line

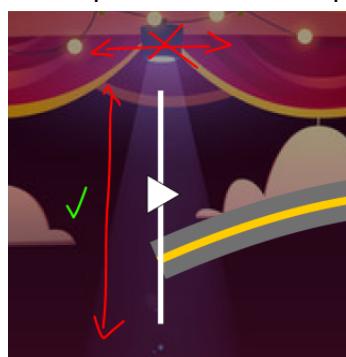


Figure 23.

- Challenges: the line snakes in unpredictable patterns and moves from right to left quite fast. the cursor can only be moved up and down.
- Rewards: keeping the mouse right on the line rewards the most points and keeping it on the line for certain continuous amount of time multiplies the points. A progress bar shows how many points and stars have been earned so far.

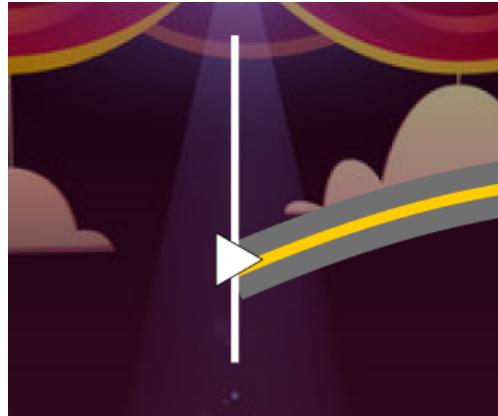


Figure 24.

Maximum points earned while on the yellow middle line



Figure 25.

Point multiplier starts when keeping the mouse on yellow for x amount of continuous seconds

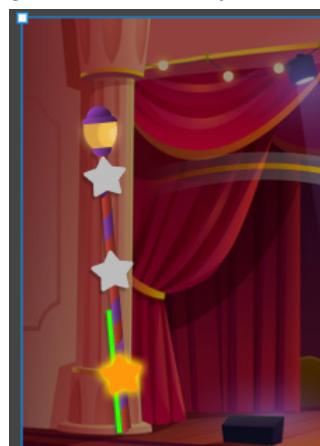


Figure 26.

Star progress bar

Unique Selling Point (USP):

Casual game mechanic that matches with the theme of the Muziekcentrum

Target Audience:

Children aged 5-10 who are going to visit the Muziekcentrum

Platform:

PC, Mobile

Scope & Vision

Visual/Art Style:

Stylized realism

Audio Style:

Light hearted and simple

Estimated Scope:

Minigame, 5 min max gameplay time

Narrative Hook (Optional):

The player is responsible for the singer's pitch.

Appendix G

Grote Kerk Minigame Concept Overview

Game Title:

Tune the Organ

Core Concept:

The organ of the Grote Kerk has pipes that need tuning. The player must find the out of tune pipes and tune them to complete the minigame. The tuning happens with a mechanic similar to Skyrim's lockpick mechanic, where the player needs to look for the correct pitch by searching for the right spot.

Genre:

Puzzle

Key Elements

Core Gameplay Loop:

- Actions: Select an out of tune pipe, search the right pitch using the tuning tool
- Challenges: Finding the out of tune pipes requires paying attention to the tuning tool and looking for outliers, Tuning the pipe doesn't show the right pitch so the player needs to play around with the tuning and use the tool to see how the adjustments affect the pitch
- Rewards: The player scores points based on how easily to tune each pipe

Unique Selling Point (USP):

The core loop of the game is unique and different compared to the other minigames and matches one of the unique aspects of the Grote Kerk well.

Target Audience:

Children aged 5-10 who are going to visit the main theatre

Platform:

PC, Mobile

Scope & Vision

Visual/Art Style:

Stylized realism

Audio Style:

Light hearted and simple

Estimated Scope:

Minigame, 5 min max gameplay time

Narrative Hook (Optional):

The organ is out of tune and needs to be tuned before the performance starts