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Designing Player Agency Experiences for Environmental Awareness Gameplay

MASTER'S DEGREE PROJECT

Diogo Luís Spínola Fernandes
INTERNATIONAL MASTER OF INTERACTIVE MEDIA DESIGN

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ORIENTATION

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PLAYER AGENCY EXPERIENCES FOR ENVIRONMENTAL AWARENESS GAMEPLAY

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Abstract

This study applies the creation of a survival-themed video game called Little Farm Island. The goal of the game is to provide players with an immersive and challenging survival experience that tests their problem-solving skills and decision-making abilities. The game Little Farm Island is set in a low poly environment with limited resources and features character customization to enhance player immersion. The objective of this project is to design and implement gameplay mechanics that can effectively increase player engagement and enjoyment, evaluating the effectiveness of these mechanics through playtesting and analysis based on survey data gathered by players. Through the development process, various mechanics were enforced and tested, including growing crops and open-world exploration. The results of the playtesting showed the potential of this game for promoting environmental awareness and problem-solving skills through engaging gameplay. In addition, the game was found to provide players with knowledge and skills that can be applied in real life, and the importance of caring strategies for increasing player satisfaction and happiness through meaningful gameplay experiences. This project demonstrates that is possible to create an engaging and immersive survival game through the use of well-implemented mechanics and character customization.

KEYWORDS: Farming, simulation, video game, environment, agency, interaction, environmental awareness, survival

Resumo

O jogo Little Farm Island é ambientado em um ambiente low poly com recursos limitados e conta com personalização de personagem para aumentar an imersão do jogador. O objetivo deste projeto é implementar mecânicas de jogo que aumentem efetivamente o seu engajamento e a felicidade dos jogadores durante a jogabilidade, avaliando a eficácia dessas mecânicas por meio de testes provenientes da sessão de jogo e a análise com base em um questionário realizado para os jogadores do mesmo. Durante o processo de desenvolvimento, várias mecânicas foram implementadas e testadas, incluindo o cultivo de plantas e a exploração do mundo aberto disponível no jogo. Os resultados dos testes mostraram o potencial deste jogo para promover a conscientização ambiental e habilidades de resolução de problemas por meio de jogabilidade cativante. O jogo fornece aos jogadores conhecimentos e habilidades que podem ser aplicados na vida real em meio de consciencialização ambiental, criando estratégias úteis para futuros desenvolvedores de jogos usarem mecânicas e experiências significativas construidas neste estudo. Demonstrando que é possível criar um jogo de sobrevivência imersivo através do uso de mecânicas bem estruturadas, exemplificando que a personalização do personagem implementado para Little Farm Island cria um sentido de imersão entre jogador e jogo positivamente.

PALAVRAS-CHAVE: Agricultura, simulação, jogo de computador, ambiente, sentido de agência, interação, consciência ambiental, sobrevivência

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CHAPTER I

INTRODUCTION

This chapter provides an overview of the motivation and goals of the project, which is to create an indie game called *Little Farm Island* that promotes environmental awareness and teaches problem-solving skills through engaging gameplay. The chapter also introduces the main themes and challenges of the game and explains the design and development process that will be described in the following chapters.

1.1 Motivation

In recent years, games have gained popularity for their potential use in education and entertainment. As such, gaming-focused courses have become more prevalent, with evidence suggesting positive effects on student engagement and enrollment. Despite this, many graduates still lack the necessary teamwork and problem-solving skills sought by industry employers. A study by Anthony Estey, Amy Gooch, and Bruce Gooch [2] highlights the challenges faced by game design professionals in this regard. Furthermore, the rise of independent game production has made game creation a more accessible pursuit, with the term "indie game" becoming increasingly popular [3]. Given this context, the motivation for creating an indie game is to introduce a unique and innovative game to a regional market, apply various knowledge learned in coursework, and create an interactive and dynamic space that promotes environmental awareness and problem-solving skills. This project serves as a professional milestone and an opportunity to explore the potential of games as a tool for teaching players about environmental issues and solutions. As Professor Atsusi Hirumi notes, "To design engaging games, instructional designers must play games and develop a sense of what makes them fun and what modern game technology has to offer".

[4]. The challenge of this project is to create an indie game that promotes environmental awareness and teaches problem-solving skills through engaging gameplay. This game will explore the potential of video games as a tool for promoting environmental action and education on complex environmental issues and solutions. To achieve this, the game will incorporate environmental themes and challenges into its mechanics and design.

In order to create an immersive and well-defined game, it is crucial to consider various contexts and perspectives. For instance, the game's focus on environmental awareness necessitates the development of responsible actions and a model for the relationship between humans and the environment. Serious games, which are known for their engaging features and ability to captivate players, can serve as a useful ally in achieving this goal. For example, a survival game that challenges players to think critically about their environment and learn about its workings could be an effective way to promote environmental awareness and problem-solving skills. The creation of this game is driven by personal curiosity and a passion for video games. With access to the necessary tools and resources, the goal is to design and develop an innovative game from its inception to its final playable state. This process will involve testing various mechanics and features to create a sense of agency and immersion for players, and making updates as needed to improve the game. The game will be called *Little Farm Island* as it takes place on a small island and revolves around farming and resource management. The gameplay mechanics in this app were specifically designed to incorporate elements beyond simple survival, (e.g. character creation, fire building, and exploration). After creating a playable version, a questionnaire was created to allow players of varying ages to review the game online in an anonymous format. This allows players to provide their own opinions on the game and its various elements, highlighting both the positive and negative aspects.

The impact of these reviews is up to the individual player and the final review they provide. The sense of agency, based on the article "I did that" by David Coyle, James Moore, and Per Ola Kristensson mention [6]; is defined by cognitive neuroscience, as the experience of controlling one's own actions and their effects on the external world. This sense of personal agency is a key factor in how individuals interact with technology. There are two ways in which this sense of agency can be enhanced. First, skin-based interaction can substantially increase users' sense of agency, and second, assistance techniques such as

predictive mouse acceleration can have a significant impact on users' sense of agency. These methods provide designers with new ways of evaluating and refining empowering interaction techniques and interfaces, allowing users to experience a sense of control and ownership over their actions.

In terms of gameplay mechanics, video games are typically separated into two distinct parts: interface and gameplay. As the authors, Jesper Juul and Marleigh Norton mentioned in the article about the border between interface and gameplay [7]. Good video games have easy-to-use interfaces, but also provide challenging gameplay challenges to the player. The relationship between easy interfaces and challenging gameplay is not universal or a requirement for game quality, as the lack of a clear distinction between the two is due to the fact that games are designed to provide a pleasurable activity rather than to accomplish a specific task. The success of a game's mechanics depends on the ability to engage and immerse the player in the gameplay.

Player agency is a critical element in the creation of interactive narratives and games. However, the perception of agency is influenced by multiple factors beyond meaningful choices, (e.g. social investment, individual preferences, and value judgments). These individual differences have a significant impact on the perception of agency and more narrative-focused gameplay. The article written by Elin Carstensdottir, Erica Kleinman, Ryan Williams, and Magy Seif Seif El-Nasr by the name "Naked and on Fire" [8]; gives the necessary inside on the examination related to the player agency experiences to narrative-focused gameplay. To enhance and measure player agency within an interactive narrative, it is important to consider the various factors that affect the perception of agency. Playtesting is a useful tool for developers to understand how players interact and behave during gameplay, and to identify and resolve potential problem areas. Indie game developers, in particular, can benefit from user research processes and approaches tailored to their needs and budget.

Programs for indie game development provide opportunities for solo developers and small companies to create games and applications without the need for a large budget, as the article by Pejman Mirza-Babaei, Naeem Moosajee, and Brandon Drenikow about playtesting for an indie studio may suggest [9].

1.2 Research Opportunity

For this project, it is important to explore the mechanics of a farming/survival simulator game within the context of existing games in the public market. This includes identifying the game's genre and player base, as well as potential gameplay testers. The project is being developed on a solo basis, with an emphasis on program implementations, design choices, main objectives, and environmentally aware responsible gameplay. Through my research, I have learned that game creation is valuable for both students and the industry, as it can improve development and project management skills, provide portfolio prototypes, and foster strong networking and communication skills.

Additionally, promoting the creation and experimentation of new indie game genres can bring benefits for developers and their supporters, creating a niche of interest for creative and motivated individuals. The community can grow and learn from mistakes, ultimately strengthening the local game industry. This research focuses on the development of a 3D low-poly farming simulator for casual gaming, incorporating environmental themes and challenges, and promoting player agency and environmental awareness. Changes to the game will be based on player feedback, with a focus on gameplay mechanics that enhance the player's sense of agency.

The creation of game prototypes can provide valuable benefits for both students and the game industry. This includes advancing development and project management skills, improving effort estimations, creating prototypes for portfolios, and fostering strong networking and communication skills. Additionally, promoting the creation and experimentation of new indie game genres can boost the local gaming industry by connecting and training new talent, opening up recruiting possibilities, and building a strong local network of developers. A study by Johanna Pirker and Annakaisa Kultima at the Graz University of Technology suggests that the creation of local game jams can have a positive impact and potentially strengthen the local game industry [1]. Projects that promote the creation and experimentation of new indie game genres can bring benefits for both developers and their supporters, creating a niche of interest for creative and motivated individuals. The community can grow and learn from mistakes, strengthening the industry for the future. The main focus of this research is on implementing changes to the game based on player feedback, analyzing the broader gameplay elements, and questioning which mechanics will enhance the player's sense of agency. The goal is to create a game that

addresses these issues while also providing a thorough understanding of game creation and its challenges. This work aims to improve the game and its mechanics in order to provide players with a more engaging and immersive experience.

1.3 Research Questions

The main research question of this paper is: "Will different game mechanics applied to a simulator game improve the player's sense of agency?"

As stated in the article by Bride Mallon [11], the use of well-defined game mechanics can enhance a player's sense of agency. A taxonomy for a game can be useful for game designers in terms of incorporating user input and input triggers and evaluating the quality of interaction. Players often judge a game's quality based on the extent to which their agency is enabled or inhibited. Therefore, it is important for game designers to consider how to incorporate user input and input triggers and to evaluate the quality of interaction in order to create a game that enables players to feel a sense of agency.

Aspects players feel they have agency on, that they affect	Mechanisms facilitating felt agency
Partial but limited control over tools and implements for action-motor tasks such as combat or driving. (e.g., agency only in pointing a tool in the right general direction and activating it).	The functionality of tools and implements is partly automated (analogous to an automatic camera or automatic car transmission).
Adjusting and manipulating multiple attributes of tools during action-motor tasks. Greater demands on their skills through a greater degree of control than in the above limited control instances.	Placing a number of attributes of a tool's functionality under player control. Providing manual as distinct from automated control tools.
Refined, subtle, and careful implementation of the required action-motor skills.	Requiring a degree of skill (sensitivity or precision) to work the tools. Providing realistic sensory feedback during action scenes.
Stretching and improving skills	Increasing the level of difficulty by various means, such as altering the variables or conditions which affect the original challenge (e.g., speed constraints, number of opponents, progressively better competitors, variation in terrain conditions), or by providing additional challenges,—all of which make more demanding claims on players' skills.
Exercising and combining multiple skill types. (Many, although not all, players preferred the combination of tactical and strategic skills with action-motor, rather than the exercise of action-motor skills alone.)	Placing demands on strategic as well as action-motor skills for successful task performance. Differential feedback contingent on successful or unsuccessful strategies and actions by players.

Taxonomy of where and how to incorporate player agency. Table showing results found [11].

As shown in the table above, various well-defined game mechanics can create a sense of agency in players. The use of a taxonomy for a game is useful for game designers in terms of incorporating user input and input triggers and evaluating the quality of interaction. Players often judge a game's quality based on the extent to which their agency is enabled or inhibited. This table provides a link between the two approaches to game mechanics.

The first approach focuses on the analytical and prescriptive outcomes, providing insight into how and why particular responses are produced. This is useful for analyzing and diagnosing players' feelings of agency. The second approach focuses on the game artifacts and mechanisms, providing guidance for designers on where and how to incorporate user input and triggers. Open-world games offer players more freedom than games with linear

progression structures, but without clearly defined objectives, they can leave players without a sense of purpose. It is likely that different game mechanics applied to a simulator game can improve the player's sense of agency. By providing players with the ability to make choices and decisions, and by giving them feedback and consequences for their actions, game mechanics can enhance the player's sense of control and influence over the game. Additionally, mechanics that provide players with a sense of control over their avatar or character, and that allow them to explore and interact with the game world, can also improve the player's sense of agency. However, the effectiveness of different game mechanics in improving the player's sense of agency will depend on the specific game and its context. It is important to carefully consider and test different game mechanics in order to determine their impact on the player's sense of agency.

Creating subtopics for a research question can provide further context and support the main argument of the thesis: "Which game mechanics will lead to an improved sense of environmental awareness?"

It is a relevant and focused subtopic that can provide further context and support for the main argument, which is the impact of different game mechanics on the player's sense of agency in a simulator game. This subtopic focuses on a specific aspect of the game mechanics, namely their ability to enhance the player's awareness of their surroundings and the environment in the game. The authors of the article cited "Farmer's tale: a Facebook game to promote volunteerism" [13]; by Don Sim Jianqiang, Xiaojuan Ma, Shengdong Zhao, Jing Ting Khoo, Swee Ling Bay, and Zhenhui Jiang, provide specific examples of game mechanics that can be used to improve environmental awareness, such as incorporating elements of farming and volunteering into the game design and awarding unique items to players who complete real-life volunteer tasks. Games like this are designed with an environmental awareness plan on the conception of their core game mechanics, *Farmer's Tale* is focused on the volunteering activity and has some farming elements that can create interest in players to farm (e.g. houses decorations, animals to take care, planting flowers), and also some customized elements and unique items that are only awarded to players who complete volunteer tasks in real life. The aim is to attract the game players and make it easier for them to volunteer, creating environmental awareness:
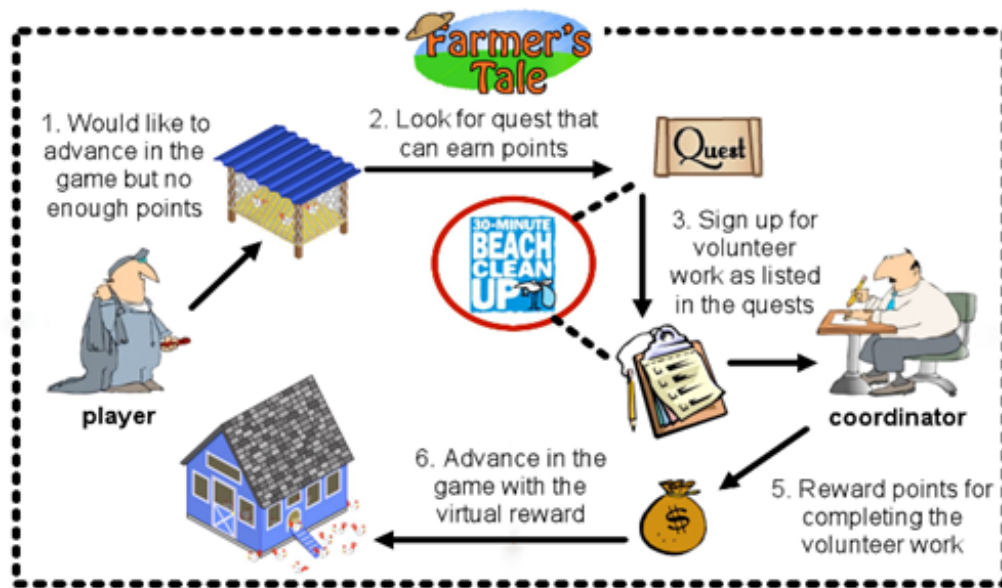
Farmer's tale. Interaction mechanism creating a gap between the virtual and real world [13].

The goal of this mechanic is to attract players to the game and make it easier for them to volunteer, thus increasing environmental awareness. There are several other game mechanics that may lead to an improved sense of environmental awareness among players. These include mechanics that incorporate environmental themes and challenges into the gameplay, allowing players to explore and interact with virtual environments in a realistic and immersive way, and providing players with incentives and consequences for their actions. By incorporating these mechanics, a game can educate players about complex environmental issues and solutions, encourage them to think critically about their impact on the environment, and promote environmentally friendly behavior both in the game and in the real world.

Another question can be mentioned, if the game developed is an immersive 3D survival open-world simulator: "Owning a farm will lead to an increased sense of agency, compared to just exploring the world?"

To give context to that question an article from Lauren Herckis, Jessica Cao, and Jacqui Fashimpaur studied virtual houses in games and observed that it takes time for a virtual place to feel similar to a real place [14]. The spot where the player gathers most of his time during gameplay becomes a meaningful place with time, creating a familiar feel for the player itself. Mixing the option to that spot being a customizable space, can create a player's

emotional relation to, and shape expectations of that place. In summary, a home is a special kind of place: a spatial anchor and a symbol of comfort, identity, and refuge, where most games that feature a virtual home, are designed by default to be the base, the place where the player does most of their gameplay activities. This subtopic focuses on the impact of game mechanics that allow players to own and customize a virtual home or territory in a simulator game, and how these mechanics can increase the player's sense of agency. The authors argue that owning a virtual home or territory can evoke feelings of privacy, security, and ownership, and can create an emotional connection between the player and the virtual space.

This can increase the player's sense of agency, as they are able to make decisions and take actions that affect the outcome of the game, and are able to build an identity within the virtual space. In contrast, exploring the world in the game may be interesting at first, but it does not provide the same sense of control, responsibility, and agency as owning a virtual home or territory. This can increase their sense of agency, as they are able to influence and control the events in the game, even providing players with a sense of purpose and accomplishment.

1.3 Expected Contributions and Objectives

The expected contributions of this thesis include the development of a new open-world farming/survival simulator game that aims to enhance the player's sense of agency and promote environmental awareness. This game will provide players with a virtual world in which they can experiment with different approaches to environmental management and evaluate the impact of their actions. The game's design will be based on best practices in the field and will incorporate knowledge of environmental issues to improve players' skills and comprehension of the game's scenery.

Additionally, the thesis will contribute to the existing body of knowledge on game mechanics and their influence on players' agency and other variables. Through playtesting and the implementation of new and improved game mechanics, the study will aim to provide insights into the effects of different game mechanics on players' agency. The ultimate goal is to create a game that promotes environmental consciousness and encourages players to think critically about their actions in a virtual world.

To achieve these goals, the thesis will focus on the design of a player-centric game that emphasizes agency and the exploration of different approaches to environmental management. By conducting in-depth research on the effects of game mechanics on players' agency, the thesis will aim to provide answers to the research question; different game mechanics applied to a simulator game can improve the player's agency. The main topics and contributions expected for this project are as follows:

- The game will provide players with a satisfying sense of agency. By incorporating mechanics that allow players to make choices and decisions, and that provide them with feedback and consequences for their actions, the game will improve the player's sense of agency.
- Promoting environmental awareness and action among players. By incorporating environmental themes and challenges into the gameplay, and by rewarding players for environmentally responsible behavior, the game will educate players about complex environmental issues and solutions and will encourage them to adopt more environmentally friendly behaviors in the game.
- Teach players problem-solving skills. By incorporating challenges and obstacles that require players to think critically and creatively.
- Creating a sense of accomplishment and progression. By allowing players to own and manage a farm, and by providing them with goals and rewards for achieving success on the farm, the game will provide players with a sense of accomplishment and progression, the game may provide players with a sense of immersion and engagement.
- Through playtesting and the implementation of new mechanics, the game may provide insights into the ways in which different game mechanics can influence players' attitudes and actions. This new knowledge could be used to improve the design of future games with similar goals.

Overall, the expected contributions of Little Farm Island include providing players with a satisfying sense of agency, promoting environmental awareness and action, teaching problem-solving skills, providing a sense of accomplishment and progression, creating an immersive and engaging experience, and generating new knowledge on the effects of game mechanics.

CHAPTER II

STATE-OF-THE-ART

This chapter provides an overview of the current state of the art in the use of games in education and the promotion of environmental awareness and problem-solving skills. The chapter discusses the theoretical foundations and research evidence on the potential of games to engage and educate players and provides a context for the design and evaluation of *Little Farm Island*, the indie game that is the focus of this project.

2.1 Historical Framework

The historical framework for the development of *Little Farm Island* includes the use of computer games as a means of storytelling and the exploration of open-world environments. Games like *Grand Theft Auto*, *Assassin's Creed*, and *Fallout* have popularized the concept of open-world gameplay, in which players can roam freely around the game world and experience the game's story and mechanics at their own pace.

Sandbox games, which allow players to explore and experiment with a virtual world without the constraints of a linear narrative or strict objectives, have also played a role in the development of *Little Farm Island*. The game's open-world design and the inclusion of crafting and survival mechanics are influenced by the sandbox genre, providing players with the freedom to explore and interact with their virtual environment. An open-world game usually lets the user explore the world with no in-game timer and without a fundamental objective in mind. Robert Houghton's article mentions another way of frameworking for games, playing a game can add historical value to the player culture through immersive gameplay experiences, being a real replacement for traditional media in storytelling and academic research [24].

In terms of the technologies used in the development of *Little Farm Island*, the game was created using the *Unity* game engine [10] and the Visual Scripting extension. These tools allowed the game's designer to program and customize game elements, creating a unique and engaging player experience. The game's design was also informed by the designer's learning and experiences in the International Master of Interactive Media Design course, providing a foundation for the game's mechanics and aesthetic. *Little Farm Island* was inspired by the exploration and creativity of games like *Minecraft*. The open-world design of the game allows players to explore and interact with their virtual environment, engaging in tasks and activities that promote environmental awareness and action. The inclusion of crafting and survival mechanics also adds to the immersion and challenge of the game, providing players with the opportunity to use their problem-solving skills and develop strategies for managing their farm and their character's needs.

Like *Minecraft, Little Farm Island* does not follow a linear narrative structure, instead providing players with the freedom to explore and experiment with the game world at their own pace. The game's design and mechanics encourage players to engage with the environment and to make choices and decisions that affect their gameplay experience. This approach to game design allows players to discover and create their own unique stories within the game, providing a sense of agency and control over their virtual world. Just exploring and creating is enough to make a player enjoy it in many different ways, revealing the player's creative side, information based on the article by Ekaputra, Glenn, Charles, and Kho; "Minecraft can be used both for education and as a scientific learning tool" [25].

Sims is a social game that features various forms of customization, where the players start a life with a family and share a house, playing as a god in a sense, making sims act and behave the way intended. The basic human things mainly, eating and sleeping are very important, one of the most interesting things is the fact that allows the player to buy a terrain and customize it, buy a house or a farm and decorate it freely, making it fully furnished. *Farmville*, farming is one of the most relaxing things a person can do, managing your own farm, planting and collecting what you planted over time, this game was famous even before farming games were played by casual gamers, played as a trend on Facebook for people of all ages, the game was easily accessible for different people and attracted the most diverse age group. This is a game that can be played as a social component, managing a farm and sharing it with others to make them visit your farming space. A sense of accomplishment and interaction is presented here, the games mentioned were the base for the historical framework to create *Little Farm Island*, borrowing elements of various degrees of customization, farming, and world-changing, always presenting the player with the feel of a virtual space or home [14].

2.2 Game Mechanics in a Farming / Survival Simulator

To inspire and reference a farming game with various mechanics that improve a player's sense of agency, *Stardew Valley* is a farming simulation game that incorporates crafting mechanics to improve the player's sense of agency. The game allows players to control a single character and manage a farm, forming relationships with other characters in the village and completing tasks to progress in the game. Crafting is a central mechanic in the game, with players using materials to create items that can be used to generate income or to facilitate the gathering of more materials. The game also incorporates survival elements, such as the need to eat to survive and the possibility of encountering enemies that can be defeated to obtain food. These mechanics add to the immersion and engagement of the game, as players must constantly search for resources and manage their character's needs to progress in the game. The article published by Anne Sullivan, Mel Stanfill, and Anastasia Salter about hardcore crafting, references that using a good crafting system is central to great play [15].

The success of Stardew Valley and its use of crafting and survival mechanics can serve as inspiration for the development of *Little Farm Island*. By incorporating similar mechanics, the game can provide players with a satisfying sense of agency and promote environmental awareness and action. The game's mechanics can also contribute to the creation of a new body of knowledge on the effects of game mechanics on players' behavior and attitudes.

Stardew Valley screenshot. Image showing the gameplay.

Survival games go well with farming and crafting mechanics, survival games are characterized by how the player tests their survival skills in a hostile environment, in this genre is common to have a mechanic in which a player needs to eat to survive, whereas if the player doesn't eat for a long time, then the hunger meter drops and the player dies. In some games, enemies need to be defeated (e.g. monsters or predatory animals) so the player can get food. Many survival games often need a constant search for food, water, and helpful items, which can in turn be crafted into more complex items or tools. Katja Rogers, Clemens Kamm, and Michael Weber published an article about how a player can adapt to a survival game, studying all of the different player behaviors and traits [16].

All of these survival mechanics can aid a farm game, in which it is expected that the in-game player can take care of himself, and the farm, using the game elements and items in a way that the gameplay goes smoothly and becomes enjoyable.

2.3 Genre and type of games

In the world of video games, genre refers to the categorization of games based on their gameplay mechanics, themes, and other elements. Genres can help players understand the basic elements of a game and what to expect from it, as well as allow developers to target specific audiences with their games. Some common video game genres include action, adventure, role-playing, strategy, simulation, and sports. Within each genre, there are often sub-genres or subtypes of games that offer variations on the basic gameplay mechanics. For example, within the action genre, there are sub-genres (e.g. first-person shooter, hack and slash, and platformer. Within the role-playing genre, there are sub-types such as massively multiplayer online (MMO) and turn-based role-playing games (RPGs).

It's important to note that many games do not fit neatly into a single genre and may combine elements from multiple genres. A game could be classified as a role-playing game with elements of strategy and simulation. This diversity and variety in game genres allows for a wide range of gameplay experiences and allows players to choose the types of games that best suit their interests and preferences.

The creation of a well-defined game with long-term objectives requires answering key questions about its purpose and genre. One important consideration is whether the game is intended to be a pure entertainment game or a serious game. A study about serious games for health published by Voravika Wattanasoontorn, Imma Boada, Rubén García, and Mateu Sbert [19], mentions the use of 3D game engines to create realistic experiences for players, serious games focus on learning or training, and the lessons learned are expected to be used in real-life work environments, serious games are present in many areas of knowledge, including military, health, manufacturing, education, and medicine which are designed to educate or train players and have real-world applications, As an example, a serious game designed to educate healthcare professionals could use 3D game engines to create realistic simulations and help players avoid medical errors. In the case of the proposed game, *Little Farm Island* is intended to be a serious game that helps players manage resources and interactions in a virtual environment, with the goal of creating a tangible awareness of environmental issues and providing a realistic player agency experience. The game will be designed as an adventure and simulation game, with elements of farming simulation to allow players to grow plants and cut trees for personal use or sale.

Adventure games are characterized by interactive stories driven by exploration, focusing on narrative and character development, while simulation games aim to create a virtual representation of the real world that resembles our reality. By combining these elements, *Little Farm Island* aims to create a unique and engaging gameplay experience that also has real-world applications. Designed for a single-player experience only with an emphasis on story and character [23]. The simulation aspect tries to create a virtual representation of the real world within the game elements in a way that resembles our reality.

2.4 Increasing the player's sense of agency

Due to a more increased player-driven open-ended approach to game design, sandbox survival games can offer a wide variety of interesting mechanisms that make the player's sense of agency increase, motivating the player's curiosity to know more about what is possible to explore in a certain game, the limits, and secrets, thus provide more elements that might appeal to several different player types. Making a player immersed and busy on an in-game task, is logical that can boost a player's sense of agency and involvement if all focus goes to that specific action. If the players' virtual house [14] and the crafting mechanics of a survival game [16] are implemented in the right way is possible to understand their interest and the visible increase in the sense of agency felt.

Other factors can also be the way a game is designed through exploration, items, and game content. To unpack a big open world makes the player curious in finding all the possible hidden content a game has to offer. and for those moments or possible hours, depending on the scope of the game, a player's investment increases. A game agency is typically defined in terms of the choices or freedom granted to a player that can prioritize the influence of his involvement in a game.

2.5 Character agency

This is an already established traditional creative writing that considers the character agency as an important key to telling a good story, making one or various sets of characters in a game stand out to the player's emotions and actions. An author named Alayna Cole published an article that makes a connection between character and player agency in a video game [29]. The challenge of making a videogame character relatable to some aspects of the player base audience, this character(s) may relate to the natural human nature feelings through the gameplay experience. Engaging an audience of motivations that characters seemingly do not control, a character role in an already well-defined game world with its own sets of rules and mechanics. Character agency intersects with the agency of non-player characters (NPCs) and each of those characters can represent and act as multi-faceted complexities, most of them can form relationships with the audiences and in the game narrative itself.

Character agency is a crucial aspect of storytelling in video games that allows players to feel a sense of control and agency over their actions in the game world. It is achieved by creating characters with their own motivations and desires, which can create conflict and drama that keeps players engaged and invested in the story. However, it is important to strike a balance between character agency and player agency, as too much control by the player can undermine the believability of characters and reduce their sense of agency. Character agency helps to create believable, multi-faceted characters that players can relate to and become invested in, enhancing the overall gameplay experience.

2.6 Setting up an Indie game

The utilization of *Unity* and *Game Creator* as game development tools allows for the exploration and enhancement of personal skills in game creation. Unity [10] is a widely utilized game engine that enables the creation of 2D and 3D games for various platforms, including PC, console, mobile, and web. It offers a comprehensive range of features and tools to assist in the design and development process, including a visual scripting system, which allows for the rapid prototyping and testing of game ideas. *Game Creator* [17] is a collection of modular tools that can be used in conjunction with *Unity* to facilitate the creation of a wide range of video games. It includes a variety of components, (e.g. a character controller, a dialogue system, and a quest system), that can be utilized to build and customize games to meet the specific needs of the developer. The use of the technologies provides opportunities for learning and practicing game development skills, as well as the ability to create unique and engaging video games. These tools enable designers to explore their creativity and innovation, leading to the development of captivating and immersive gameplay experiences.

As mentioned in the article [3], Indie game development was often undertaken by small teams or even solo developers has grown significantly in recent years, evolving from bedroom-based businesses to successful projects fueled by passion and dedication. These indie developers, who may be pursuing game development as a side hustle or as a means of personal expression, are able to create and release games that are often unexpected and satisfying due to their hard work and dedication to a project.

In contrast to large-scale, mainstream triple AAA games that prioritize profit and popularity and are often carried out by teams with hundreds of employees in specialized areas, indie game development involves shorter development times and less complex game structures, allowing for a greater focus on creativity and innovation. The "do it yourself" nature of indie game development also allows for a greater level of authorship in the game development process, with the designer's voice and values being reflected in the resulting product.

There is a distinction between art games and indie games, with the former often challenging cultural stereotypes and engaging in social and historical critique. However, both forms of game creation have the potential to be expressive and transcend specific genres, technologies, or platforms. Early indie game developers often emphasized technical expertise as a means of achieving visible success, but both art games and indie games offer opportunities for experimentation and creativity. The designer's voice and their own values are reflected in the resulting game as their product. There is a difference between art games and indie games, the first one is referring to games that can challenge cultural stereotypes, often social, and historical critique, as the author Emma Westecott mentioned in the article "Independent Game Development as Craft" [30]. Profit is not the priority, indie games are focused on experimentation, some with commercial ends, and are very creative-based.

These developers, who may be pursuing game development as a side hustle or as a means of personal expression, are able to create and release games that are often unexpected and satisfying due to their hard work and dedication to a project. Overall, indie game development allows for a unique and personal approach to game creation that can lead to innovative and engaging gameplay experiences.

CHAPTER III

ARTEFACT DESIGN

This chapter describes the narrative design and development process of *Little Farm Island*, including the mechanics, features, and aesthetics of the game. The chapter also discusses the challenges and opportunities encountered during the development of the game, and the iterations and improvements made to enhance player agency and immersion.

3.1 Storytelling for games

As highlighted in a keynote by Rhianna Pratchett, a writer and narrative designer with over 23 years of experience in the gaming industry, the creation of compelling characters is essential for effective storytelling in video games. Pratchett, known for her work on award-winning games such as *Heavenly Sword*, *Mirror's Edge*, and *Rise of the Tomb Raider*, has contributed to the evolution of narrative-driven games, which have become increasingly complex and prevalent in the mainstream gaming market. In her keynote, Pratchett emphasized the importance of crafting engaging and well-defined characters in order to create compelling narrative experiences, whether they be linear or non-linear in nature.

As games continue to evolve and the demands of players change, the role of narrative designers like Pratchett will remain crucial in the creation of immersive and engaging gameplay experiences. In the creation of a narrative-driven game, it is important to consider the differences between a game and a film, as a game is forever playable and has a wide range of rules and storytelling elements to work with. Game mechanics play a crucial role in level design and must be constantly evolving to keep players engaged. Secondary narratives, (e.g. journals and diaries found in-game), can add value and length to a game but are not necessarily essential to the main questline.

To create a good story, it is important to understand the emotions of the characters and use animations, sounds, and environmental storytelling to convey these emotions to the player. To create a good narrative in a video game, game designers and writers often follow an outline of the main story and gameplay elements. This outline can include information about the world and its mechanics, as well as the player's role and goals within the game. Game designers may also use a variety of narrative documents, (e.g. character bios, dialogue scripts, and environmental descriptions), to help them build and organize the game world in a way that makes sense and immerses players in the experience. By considering factors (e.g. exploration, player choice, and moral decisions), game designers can create a rich and engaging narrative that guides players through the game world and encourages them to think critically about their actions and decisions.

In recent years, there has been a trend towards more diverse and inclusive main characters in games, with an emphasis on ethnicity, sexual orientation, and various types of protagonist roles. To create compelling narrative experiences, game designers and narrative leads must work together to connect gameplay with the story, while also considering the time and influences of the game's creation. Personal insights and perspectives can also help to create unique and engaging experiences for players. Additionally, with the increasing prevalence of transmedia, big-budget games can draw on a wide range of creative media to create immersive and engaging experiences that rival blockbuster movies.

In the case of the game Little Farm Island, the focus is on testing a player's willingness to survive and studying gameplay mechanics, with a linear story that guides the player through understanding the game world through gameplay elements (e.g. ingame tutorial boards, game items displayed in a certain way to make a player understand them). The goal is to create an immersive and engaging gameplay experience that allows players to understand and interact with the virtual world in a meaningful way.

3.2 Narrative

In the narrative of the game *Little Farm Island*, players take on the role of a new farmer who is responsible for caring for their grandparent's farm. The gameplay focuses on allowing players to explore and interact with the farm, including turning on lights, opening chests, using the fridge, and other activities. As players progress through the game, they will be able to expand their farm and engage with the surrounding environment, with a sense of mystery and curiosity driving their exploration. To create a realistic player experience and maintain player interest, the game will use established game items and props to build the virtual world and facilitate exploration. As mentioned in Robert Houghton's article [24], using these elements can help players feel more connected to the game world and understand their agency within it.

While the game will have a specific gameplay route designed for players to follow, there will also be opportunities for player choice and decision-making, (e.g. using items to unlock new areas or making choices about how to care for the farm).

Little Farm Island blockage: A trash pile is blocking the player from further exploration.

As a narrative standpoint the game follows the hero's journey:

Call to Adventure: The player takes on the role of a new farmer who inherits their grandparent's farm and is tasked with caring for it. Refusal of the Call: At first, the player may feel overwhelmed by the responsibility of maintaining the farm and may be unsure if they are up to the task. Meeting the Mentor: As the player explores and interacts with the farm, they will encounter various game items and props that will serve as their guide and mentor. Crossing the Threshold: As the player gains confidence and learns how to care for the farm, they will begin to expand their farm and engage with the surrounding environment. Tests, Allies, and Enemies: Throughout their journey, the player will encounter various challenges and obstacles, such as weather conditions and hazards, but will also have the opportunity to make choices that will affect their farm and the surrounding environment. The Approach: The player will approach their goal of creating a thriving farm, and as they progress through the game, they will uncover the mysteries and secrets of the farm.

The Ordeal: The player will face the most difficult challenges and obstacles as they work to achieve their goal of creating a thriving farm. The Reward: The player will be rewarded with a thriving farm and a deeper connection to the game world. The Road Back: The player may continue to make choices and decisions that will affect their farm, and will continue to explore and interact with the surrounding environment. The Resurrection: The player will rise to new challenges and overcome obstacles as they work to maintain and expand their farm. Return with the Elixir: The player returns to the farm with a sense of accomplishment and a deeper understanding of their agency within the game world.

3.3 End-Goal and Objectives

In the game Little Farm Island, players have two main objectives: survival and exploration. To survive, players must manage their resources and try to stay alive for as long as possible, while also exploring the game world to understand the natural environment and city. The goal of the game is to encourage players to invest in the gameplay and explore all the content it has to offer, rather than simply focusing on the length of the game.

There is also endgame content that rewards players who successfully reach the peak of exploration with a congratulatory message. By providing these objectives, the game aims to engage players in a rich and immersive gameplay experience that encourages them to explore and understand the virtual world.

Little Farm Island junk building: The narrative is up to the player´s interpretation.

In this Figure of the game *Little Farm Island*, players are presented with a scene that shows a natural landscape alongside a built structure. This contrast between nature and construction may prompt players to consider questions about the necessity and impact of the structure, as well as its effect on the surrounding landscape. By providing players with the tools to explore and interact with the game world, the game aims to engage players in a meaningful way, encouraging them to consider the various elements of the game world and make sense of their place within it. The goal of the game is to provide all players with a shared objective of survival and enjoyment through immersive gameplay, to achieve this goal, players must manage their resources, interact with the game world, and make decisions that impact their survival.

Providing players with various tools and mechanics to help them navigate the game world and achieve their objectives (e.g. the ability to grow plants, cut trees, and interact with various in-game objects and characters). In conclusion, the end goal of the game is to provide players with challenges to survive and explore the game world to the best of their ability.

3.4 Characters and Interactions

The player of the game will need at the start of the gameplay experience to create a farmer; the farmer gives the player various skin options, clothes, and some more in-depth customizable aspects. The objective is to throw the player into the game with some sense of accomplishment and familiarity already at the start so that users experience a natural sense of control and ownership of the actions and options presented, as mentioned in the article of David Coyle, James Moore, and Per Ola Kristensson, referring that a player sense of agency can be defined by their own gameplay actions [6].

The character will spawn on a farm, there will be some storytelling on why he is there, this is created with some planning in mind which will motivate the player to explore the game world, interacting with a lot of the game elements and objects. Following the notes scattered around the world, the player will have a sense of how the gameplay works and the overhaul game story, the characters are; the farmer, the grandparent that gives you the farm, and other NPCs across the game, those will include vendors and merchants.

Little Farm Island merchants: Example of a merchant ready to sell items to the player.

players can interact with the game world using their mouse. This allows them to select and interact with various in-game objects and characters, such as furniture, trees, doors, and vendors. By clicking on a vendor, players can access a shop window where they can browse and purchase a variety of goods, including furniture, tools, and other useful items. The items available at each vendor may vary in quality and price, offering players a range of options to choose from as they progress through the game. These mouse-based interactions help to make the game world more immersive and interactive, allowing players to engage with the game world in a meaningful and intuitive way.

According to the publication "Player-video game interaction: A systematic review of current concepts" by Loïc Caroux, Katherine Isbister, Ludovic Le Bigot, and Nicolas Viber [31]; optimizing the design of player-video game interactions can help game designers to enhance the overall gameplay experience for players. The authors suggest that understanding players' motivations and goals, as well as the ways in which they engage with the game world and its mechanics, can inform the design of player-video game interactions in order to create a more immersive and enjoyable experience. By considering the playability of the game and the agency of its interactions, a designer can craft a more engaging and satisfying experience for players, which may contribute to the game's success in the market.

3.5 Gameplay mechanics

The gameplay mechanics of *Little Farm Island* are an integral part of the game's design and contribute to its overall identity and appeal. These mechanics include the actions and interactions that the player can perform within the game world, as well as the rules and systems that govern the game's progression and challenges. Some examples of gameplay mechanics in *Little Farm Island* include the player's ability to plant and harvest crops, cut trees, and interact with non-player characters (NPCs) and objects in the environment.

These mechanics help to create a sense of agency for the player, as they can make choices and take actions that impact the game world and their own progress within it. Additionally, the gameplay mechanics of *Little Farm Island* include features such as a health bar, inventory system, and various challenges and objectives that the player must complete progressing through the game helping to contribute to the game's replay value and appeal to players.

Little Farm Island HUD: From top to bottom, Health, Hunger, and Thirst Icons.

The addition of these HUD elements is created so the player can keep track of the game character's needs, those basic needs can range between eating and physical damage in the game world. Each serves its own gameplay purpose and creates a difficult aspect in the game world, the consideration of just exploring the world with no survival consequence would be just a plain simple action game where the planting was just used as a curiosity rather than a real necessity to keep a player alive.

The hunger and thirst are always decreasing throughout the gameplay experience, creating the need to always try to fill up these bars to 100% when possible. This careful examination of the player's needs is important to make it in the game, creating a sense of urgency and a way to keep all the interested people playing the game hooked on this mechanic. This serves as an auto extender of the gameplay itself, creating bars that decrease over time is as challenging as it is fun, and this serves as a backbone for the game itself. Additionally, the implementation of physical damage in the game allows for more strategic decision making and resource management. Players must consider their actions carefully in order to avoid taking unnecessary damage, as it can hinder their ability to continue playing and ultimately affect their overall success in the game. This adds an element of realism and immersion to the gameplay experience, as players must carefully consider their actions in a way that mirrors real-world consequences

3.5.1 Health bar

Represented as the first bar, the color scheme used is green, Commonly in typical game fashion, a healthier player's life is represented in the color green, sometimes with a cross or heart icon, to be easily recognized as a sign of life or death. This will not decrease with time, it will decrease if the player eats toxic mushrooms, is burned by a fire, touches a laser, or by falling long distances to the ground. The health bar only decreases after the player's body is a victim of physical damage or gets some harm.

Little Farm Island life loss: Losing Health by eating a mushroom.

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The addition of these HUD elements, specifically the health bar, serves to inform the player about the physical well-being of their game character and to create a sense of urgency in the gameplay experience. This mechanic serves as a means of extending the game and maintaining the player's engagement. The use of the color green to represent a healthy player's life and the color red to represent danger or damage is a common convention in video games. The sudden drop of the health bar, represented by the color red, serves to alert the player that their character is in danger and needs to take action to restore their health. If the health bar reaches 0%, the game is over and the player must start again.
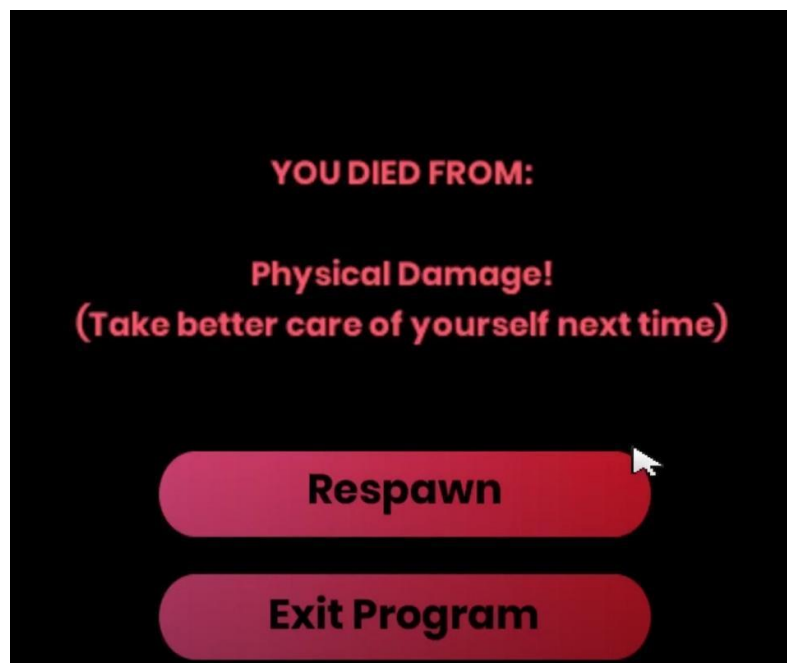
Little Farm Island death: The death screen is shown when a bar reaches 0%.

The red and black screen appears when a character dies, whether by health dropping to 0%, a player needing food for a long time, or a lack of water. However, the purpose of this game over screen is not to punish the player, but rather to serve as a learning opportunity and a reminder to pay attention to their character's needs and make sure to take care of them. It is important to balance the difficulty of the game so that it is challenging, but not so difficult that it becomes frustrating for the player.

This can be achieved through various methods such as adjusting the rate at which the character's needs decrease, or providing the player with more resources to help them manage their needs. Additionally, providing the player with clear visual indicators and cues can also help them understand their character's needs and take appropriate action. Overall, the game over screen serves as a crucial element in the gameplay experience, providing a sense of consequence for the player's actions.

3.5.2 Hunger bar

Represented as the second bar, the color scheme used is yellowish to orange so it can visually resemble the icon of a hamburger or bread. This easily makes a player know that is something related to food at first glance, with the icon the goal is to make a player know how to play naturally, not wasting too much time knowing the HUD bars and all of their complexity, simple icons and easily identifiable was the option I chose. This bar is always decreasing so the player needs to eat to replenish the missing hunger. The player can eat most things (e.g: pineapple, green leaf, corn, pumpkin, hamburger).

Each one of these food types will give a different type of food filled to the bar; the green leaf will cause just a simple increase while a pumpkin will cause the bar to increase more as followed by nutrition logic itself. Normally I conceived the increases focusing on this sense, the healthier the food is, the healthier the bar will increase. Eating a hamburger will not increase as much as the pineapple for instance.

3.5.3 Thirst bar

The thirst bar is represented in the game as a blue bar, which is a clear visual representation of the need for hydration. The bar is constantly decreasing, requiring the player to drink water or other beverages in order to replenish it. In addition to water, the player can also consume other drinks (e.g. coffee, beer, wine, or cola) to satisfy their thirst. However, some of these beverages can have negative effects on the player's character, such as becoming drunk after consuming too much alcohol.

These gameplay mechanics serve to educate players about the importance of hydration and the potential consequences of excessive alcohol consumption in real life.

3.5.4 Planting crops

The player needs to go to *Tiny Town*, a small village in the game where some vendors are waiting for the player to make some purchases; one of those is a woman selling products based on farming, flowers. This NPC sells a variety of items useful for the game player. One of those items is the Gardenbox, this one will allow the player to buy seeds and crops.

The Gardenbox will appear in the inventory so the player can choose a place anywhere on the map to place it, once placed is possible to buy crops and seeds from there. Each seed or crop presented on the screen is paid, that is to be able to cause a player sense of achievement and curiosity in planting and buying different plant types. As of now, the game presents three different crop types, this could change in a later update, and each one can have different prices and effects after the player consumes the plants in the designed crop.

Little Farm Island gardenbox: On the left is the Gardenbox and on the right is the shopping

Opening the menu on the object will present some buying options; these will have different prices and icons. Seeds are the ones player need to use for each crop, so for a carrot crop, carrot seed is necessary, for corn crops, corn seeds are necessary, and so on. The player buys a seed, and after purchase drags it from the inventory and drops it into the world, on the corresponding crop. This will result in a plant growing over time and the player can choose to pick it up or eat it right away. As seen in the article by Bride Mallon [11], game mechanics that are well executed can make the player an immersive sense of agency in a game and the immersion comes more naturally.

3.5.5 Picking up a plant

After the carrot seed is placed into the carrot crop a carrot will grow inside of it. It will take some seconds to grow, depending on what type of plant is it, the carrots have a shorter time while the pumpkin plants take the longest to grow.

Little Farm Island planting: Process of growing a carrot in the game.

When the carrot is fully grown the player can pick it up using the mouse on the plant, not only is visible that the plant is ready to be picked, also a sound effect will play to warn players that are ready to have it on their inventory. These plants are more effective in multiple crops so the player can sell to the merchants and make some money. The way the player interacts with the crop is up to the player, each crop type has a price as well as the grown plant. This will be important to measure how a player interacts; simple actions like those can affect the gameplay causing questions such as: Should I sell this plant and buy fast food? Should I eat this plant and make no profit with but my hunger is satisfied?

3.5.6 Eating plants

Throughout the gameplay, the player will need to eat different kinds of plants, each having a status attached, some will make the hunger bar fill more, the thirst may decrease, and pineapple will both increase hunger and thirst. Each plant has its characteristics, such as its ability to fill the hunger or thirst bar, and some may have special effects or be toxic. This creates a sense of agency for the player, as they must make decisions about which plants to collect and consume based on their effects. This can encourage players to explore and experiment with different plants, as they seek to understand their mechanics and use them to survive in the game. This gameplay mechanic also adds an element of challenge and decision-making to the game, as players must consider the potential consequences of their actions and choose wisely in order to survive.

In this game, the player can collect raw plants from the map by clicking on them with the mouse button. These plants are added to the player's inventory and can be consumed to restore hunger. If the player's hunger bar is decreasing quickly, they need to find a source of healthy food that will help to restore their hunger. This gameplay mechanic adds an element of survival and resource management to the game, as players must seek out and collect plants to sustain themselves. It also encourages players to explore and interact with their environment to find sources of food.

3.5.7 Cutting Trees

Players can interact with the environment by cutting down trees and collecting junk and piles of trash. This gameplay mechanic requires the player to purchase an Axe Tool from the shop and add it to their inventory before they can cut trees. When the player approaches a tree or other interactable object, a visual outline element resembling a hand icon appears to indicate that the player can interact with it. Helping players understand where they can interact with the environment and what actions they can take, reducing confusion and increasing player engagement. The use of visual cues such as the hand icon can also help to make the game more immersive, as it helps players to feel more connected to their in-game actions and the objects they interact with

Little Farm Island tree cutting: The tree before and after cutting, appearing four logs on the floor after the cut.

The gameplay mechanic for cutting trees involves the player using the Axe Tool from their inventory to chop down trees and collect logs. This requires the player to open their inventory, drag the Axe Tool to the tree, and then perform an animation of cutting near it. The player must be within a certain distance of the tree in order to interact with it. After cutting the tree, the player can collect the logs that are produced, which can be sold to a merchant for currency. This gameplay mechanic adds an element of resource management to the game, as the player must carefully consider how they will use their resources to survive. The limited number of trees on the map also creates a sense of challenge for the player, as they must find ways to sustain themselves as the environment becomes more scarce. This can encourage players to think critically about their actions and explore different strategies for survival.

3.6 Game Tutorials

Including tutorials in a game can be a helpful way to introduce new players to the gameplay mechanics and help them understand how to navigate and interact with the game world. Tutorials can be presented in various forms, such as through in-game text or speech, or through visual aids such as boards or pop-up windows. By creating tutorials based on boards, the game can provide players with easy-to-follow information that helps them learn the game without being intrusive or disruptive to the gameplay experience. This can be especially useful for players who are new to the game or who may not be familiar with certain gameplay mechanics. By providing clear and concise tutorials, the game can help to reduce confusion and increase player engagement and enjoyment.

Little Farm Island tutorial: The tutorial board, displays a message for the player to follow.

The boards are active when a player presses on them using the mouse, then a note will appear on the screen displaying relevant information on how to play the game properly. Each place has different notes, some with tutorials to be easier for a first-time player to know the game. Mentioning that boards will disappear after reading all of the different proceedings on the gameplay mechanics, in the way that those game objects do not distract the player in the late gameplay experience. A tutorial for understanding proper gameplay can only be read once after that the note disappears. Exploration and interaction with the game world are important aspects of gameplay as they allow players to discover and experiment with different mechanics and elements. This can be an engaging and enjoyable experience for players, as it allows them to learn about the game and its features in a more hands-on and immersive way.

Exploration also allows players to discover new and interesting areas of the game world, which can enhance their sense of immersion and enjoyment. While exploration may involve some trial and error, it can also be an important learning experience for players as they discover what works and what doesn't in the game. By encouraging exploration and interaction with the game world, the game can provide players with a more engaging and satisfying gameplay experience. The use of tutorials helps to reduce confusion and increase player engagement and enjoyment, especially for players who are new to the game or who may not be familiar with certain gameplay mechanics. By carefully designing and implementing tutorials, *Little Farm Island* is able to provide players with the guidance and support they need to learn and enjoy the game. The use of tutorials in *Little Farm Island* is an effective way to introduce new players to the game and help them learn and enjoy the gameplay experience.

3.7 Visual Style

The use of low poly characters in video games dates back to the mid-1990s when 3D graphics and computer technology were still relatively underdeveloped. As technology has improved, the number of polygons used to create game characters has increased, resulting in more detailed and complex models. However, the term "low poly" is still used to refer to models with fewer polygons, which are typically blocky and lack fine details. The use of low poly characters in *Little Farm Island* was a visual choice based on the easier implementation of textures in the *Unity* program [10], as well as the desire to create a more easily recognizable visual style that would not distract from the gameplay experience.

The decision to use 3D technology in *Little Farm Island* was driven by the desire to create a more realistic and immersive virtual world for players to explore. As Yuexiang Su's article [20] explains, 3D games have become the mainstream in game development due to their ability to provide higher-quality graphics and more realistic simulations for players. The use of 3D technology in Little Farm Island allows for a more engaging and immersive gameplay experience, enhancing the overall enjoyment of the game.

Polygon Farm Pack image: Display of low poly content assets to use in games.

Using Unity low poly assets is possible to create an experience that is easily identifiable to the player, the low quality and simplicity help in creating real-life alike elements that highlight very characteristic objects and scenarios of the real world.

This *POLYGON Farm Pack* uses polygonal art digitally crafted to be part of game projects, mostly on indie games and for small studios trying to create a simple yet visually interesting one. The meshes used are simple and very colorful, not very complex and friendly for most people, the most important focus is on the environment; most empirically, the planting aspect is to be easily identifiable for the gamer at a first glance. There are several advantages to using low poly assets in Little Farm Island:

- Simplicity: Low poly assets are known for their simplicity, which can make them easier to create and implement in the game. This can be especially useful for indie game developers and smaller studios who may have limited resources or time.
- Performance: Low poly assets tend to have a lower polygon count and are generally less complex than high poly assets, which can help to improve the performance of the game. This can be especially important for games that are designed to be played on a wide range of devices with varying levels of hardware capabilities.
- Visual style: The low poly art style is visually distinctive and can help to create a unique and memorable aesthetic for the game. This can be especially useful for indie games that are trying to stand out in a crowded market.
- Ease of use: Low poly assets are typically easier to work with than high poly assets, making them more accessible for game developers. This can be especially useful for those who are new to game development or who may not have a lot of experience working with 3D assets.

Overall, the use of low poly assets in Little Farm Island can help to create a simple, performance-friendly, visually distinctive, and easily accessible game world that is enjoyable for players to explore.

3.71 Low poly versus realistic graphics

The decision to use a minimalist, low-poly art style in *Little Farm Island* was made with the intention of creating a game world that is easy to recognize and accessible to players of all ages. This style simplifies the game's visual elements and reduces visual noise, making it easier for players to understand and navigate the game world. According to an article by Joel Couture [32], the nostalgia factor can be a key element in creating successful games. The retro, low-poly style reminiscent of mid-90s games can be appealing to players who remember and enjoy those types of games. Additionally, this style can help to differentiate *Little Farm Island* from other games on the market that may have more complex, realistic graphics. While high-poly graphics can be impressive and immersive, they can also be resource-intensive and require extra work from developers and artists.

By opting for a low-poly style, developers can streamline their workflow and create a game that is more accessible and enjoyable for players. The low-poly style of *Little Farm Island* serves to create a visually distinctive and nostalgically appealing game world that is easy to understand and navigate for players.

CHAPTER IV

IMPLEMENTATION

This chapter focuses on how the indie game *Little Farm Island* promotes player agency, learning time on gameplay, and the programs and applications to make this possible.

The chapter will describe the methods used to gather feedback and analyze player behavior during gameplay. By the end, readers should have a better understanding of the role of player agency, environmentally aware gameplay, and ethics in designing and developing an indie game and how it can impact player behavior.

4.1 Videogame format for creating agency

The choice of using a videogame application as a way to give the user a sense of agency is based on the nature of the interactive game itself. The video game can differentiate from other cultural products or ideas, this one is not consumed as a passive take instead the player will have to dedicate some time and effort to create a story or a self-narration for the game world. Video games should be considered the purest form of a new paradigm of cultural consumption that requires the explicit participation of the player. The one mentioned is sometimes or in still some cases tied to an "older" form of media (e.g: television, cinema, radio, or literature).

A game borrows all of the qualities in various sources of media and converts them into one, as the publication about videogame agency in contemporary society [33] by Daniel Muriel and Garry Crawford mentions, a game that a player can create the gameplay is limited to the spectrum that programmers and developers intended but also falls out of the attached spectatorship from the other media mentioned. Some games from a gameplay perspective, warn players whenever a relevant choice has been made, by announcing that some choices have consequences and will impact the overhaul storyline of a given game.

A company named *TellTale Game*s creates games focusing on the player's decisions and the impacts that fold into the storyline scenario, such as *The Walking Dead*, *The Wolf Among Us*, and *Game of Thrones*. The question of agency is related to the player's capacity to make significant changes in a video game according to the original scope designed on a developer's vision. Gives the player all the freedom to control the exploration aspect of this game, trial and error gameplay is defined in real depth throughout the whole experience. Creating player agency in a videogame involves giving players a sense of control and ownership over their actions and their effects on the game world. This can be achieved through various gameplay mechanics and design elements, such as choice-based gameplay, character customization, and open-world exploration. One way to promote player agency in a videogame is through choice-based gameplay, which allows players to make decisions that affect the outcome of the game. This can be done through branching storylines, dialogue choices, or resource management. By giving players the ability to make meaningful choices, developers can increase player engagement and create a sense of agency.

Character customization is another way to promote player agency in a videogame. By allowing players to create and customize their own characters, developers can give players a sense of ownership and control over their in-game avatars. This can be achieved through various customization options, such as clothing, appearance, and abilities. Open-world exploration is another way to create player agency in a videogame.

By giving players the freedom to explore and interact with their game world, developers can create a sense of agency and empower players to discover and experience the game on their own terms. There are various ways to create player agency in a videogame, including choice-based gameplay, character customization, and open-world exploration. By giving players a sense of control and ownership over their actions and their effects on the game world, developers can create a more immersive and engaging gameplay experience.

4.2 Environmental aware gameplay

Environmental awareness gameplay, or "green gaming," refers to video games that are designed to promote environmental awareness and educate players about environmental issues and solutions. These games often incorporate environmental themes and challenges into the gameplay, and may also include educational content and activities related to environmental conservation and sustainability. Environmental awareness gameplay can be an effective way to engage players and promote environmental awareness and action. Environmental awareness gameplay can be a powerful tool for teaching players about complex environmental issues and solutions to provide a fun and engaging way to learn about these topics. Overall, environmental awareness gameplay has the potential to be a valuable tool for promoting environmental awareness and action, and for teaching players about environmental issues and solutions in a fun and engaging way. The notion of agency can determine ways where a player goes, what he does, and how they are. In a simple game like *Pac-Man*, where the goal is to gather all the pieces of fruit on the map without being touched by ghosts, the players can choose where to go, how to plan their strategy, what routes they want to focus on, the ability to lure ghosts and many more things. This always gives an immense sense of freedom and choice in a game, causing the fun to be so entertaining overhaul.

In more narrative-driven games, *The Walking Dead*, the player's agency lies not so much in the way the player controls the main character but rather in what narrative choices are made by the player. Causing different outcomes and how the character reacts in various situations, which sides to take in conflicts, and whom to try to save in life-and-death situations. The player needs to decide as an example whether to help a character that is more emotionally attached to but is usually in the wrong or choose a new character that is more balanced but wiser and helpful in the gameplay [26]. For the environmentally focused aware gameplay aspect, games are not only used to entertain, the already mentioned serious games [19] can have different purposes focusing on healthcare, learning, and engineering aspects. Gaming has a long and rich history of being used to raise awareness of various environmental issues, useful in order to foster engagement and promote learning in situations where environmental issues interact with humans.

The topic is to extract qualitative and quantitative data about the system's behavior and the way humans act as a part of those systems, using gaming as a research method. Casper Harteveld and Anders Drachen published an article in 2015 [28], about gaming on environmental issues, where some of the systems in-game may have to be studied predominantly, to be more focused either on the environmental aware aspect or to favor compelling and interesting gameplay experience for the player. Those contributions come in part as designed state-of-the-art methods and techniques to acquire relevant game data. For part of environmental awareness, games can motivate several purposes; (e.g training, persuasion, participation, assessment, data collection, scenario analysis, and data analysis).

4.3 Learning time on Gameplay

The article by Carlo Fabricatore published in 2007 [21], mentions that players judge a video game based on the gameplay mechanics, analyzing it and asking questions, such as "what the game is about", the goal of the game is important, and some scientific findings show that players have more interest in functional aspects than in the game overhaul aesthetic. Good and fresh gameplay is the motivation needed for a new player to be more focused on the game itself, only after the familiarity of this aspect that a player can start to lose interest in trying or exploring other elements in the game world.
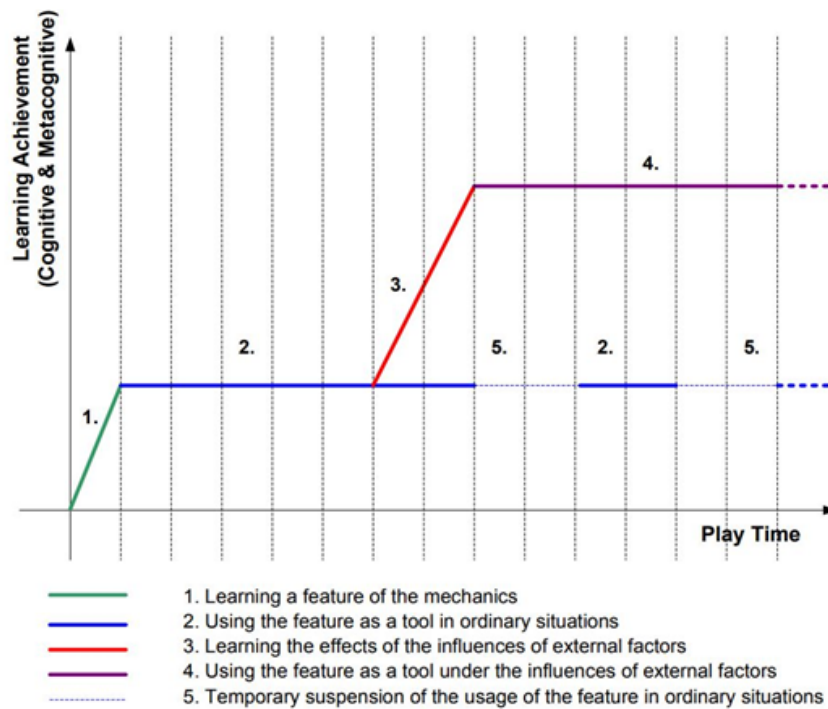
Balancing learning and application processes. Chart showing gamers learning curve [21].

From the chart shown, it is relevant to understand that a player, when dealing with a new feature in the game mechanics, always will have to learn how to use it first for continuing the gameplay, the learning time should not be too long, otherwise, frustration may arise. Most games know this and use or prevent it with clever design. After the learning process is completed the game will test the player, allowing and applying what is learned in ordinary situations, using it embedded in the game mechanics itself.

This process, to be meaningful and rewarding, should be ideally used at least three times, as mentioned in the article [21]. After this, it will be possible to introduce novel stimuli and further sustain motivation by allowing the player to learn how to use the feature under the influence of external factors.

It is difficult to determine how long a player will remain immersed in a videogame after learning the mechanics, as this can vary greatly from person to person. Some factors that may influence the length of time a player remains immersed in a videogame include the complexity and depth of the gameplay, the player's level of interest in the game, and the availability of other competing distractions. For some players, the process of learning and mastering the gameplay mechanics may be an integral part of the enjoyment of a video game. These players may continue to be immersed in the game for a longer period of time as they explore and discover new strategies and techniques. Other players may become less immersed in the game once they have learned the mechanics, and may be more likely to move on to a different game or activity. In these cases, the length of time a player remains immersed in a videogame may depend on the overall quality and appeal of the game, as well as the player's personal preferences and interests.

Is worth noting that this concept is subjective and can vary greatly from player to player. Some players may be more easily immersed in a game, while others may be more resistant to the immersive qualities of a video game. The length of time a player remains immersed in a videogame will depend on a combination of individual factors and the specific characteristics of the game itself.

4.4 Game moral ethics

Not all games respect a steady fixed moral standpoint, some have highly complex systems in place and definitions that the player may encounter that challenge the gameplay and give the player the choice, usually a streamlined "A or B type of choice". Some games have a method of judging the playable character's actions while others use more complex gameplay situations to illustrate a course of action, many of those with the informed moral weight of the decision, either by some text or popup information on a HUD window.

In the game, *Little Farm Island*, the moral ethics of the actions is focused through the gameplay, causing the player to be aware of the consequences in the aftermath of what happened, as a result (e.g. there are no more trees to cut on the map, and the player can't collect logs anymore, this game object is a finite resource). In most games of the market today, the moral choices can change from game to game, what is right can be wrong in another game which is why the measurement of those moral choices available before is always helpful. Based on the article "Measuring Morality: Moral Frameworks in Videogames" by Clayton Whittle [34] mentions; the outline of ethics is always a priority from a gameplay perspective on a game because developers tend always to see what is possible to do in a game and where they are taught a line or limit on the player choices.
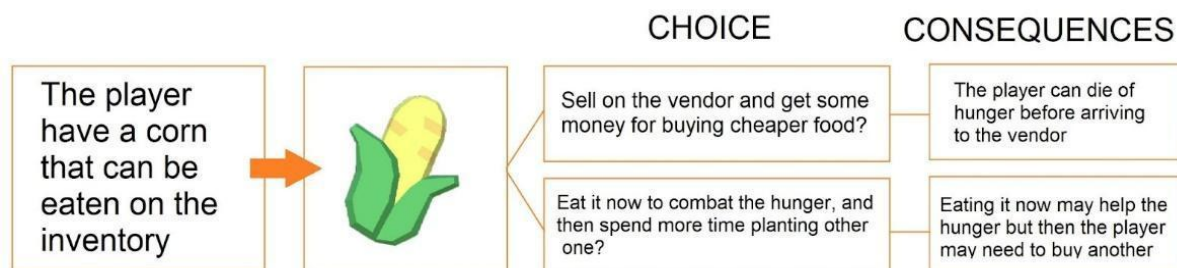
Graph created based on game mechanics. Example of choices available on Little Farm Island.

In the image above, a player can have two choices; sell the corn for instant profit or eat it to make the character less hungry. Each of these actions has consequences and in a game where money is scarce and planting things take some time to do, the player can have all the liberty to think about the pros and cons of each action. The limited availability of resources and the necessity of maintaining a certain level of hunger or food stores require players to weigh the potential consequences of each action. This decision-making process is further complicated by the presence of elements related to the character's overall survival. As a result, players must be mindful of their resource management and strategize in order to extend their in-game survival as long as possible.

4.5 Game Implementation

The original idea is to create a proper game, a farming game of sorts, where simple user interaction such as a mouse click can change how the scenario reacts and how things unfold. The sense of agency in a player and his accomplishment can be explored and evokes the best way to create a friendly-accessible interface for the user. Working as a way to express the creativity and the technology of Game Creator [17], learned through the academic course itself.
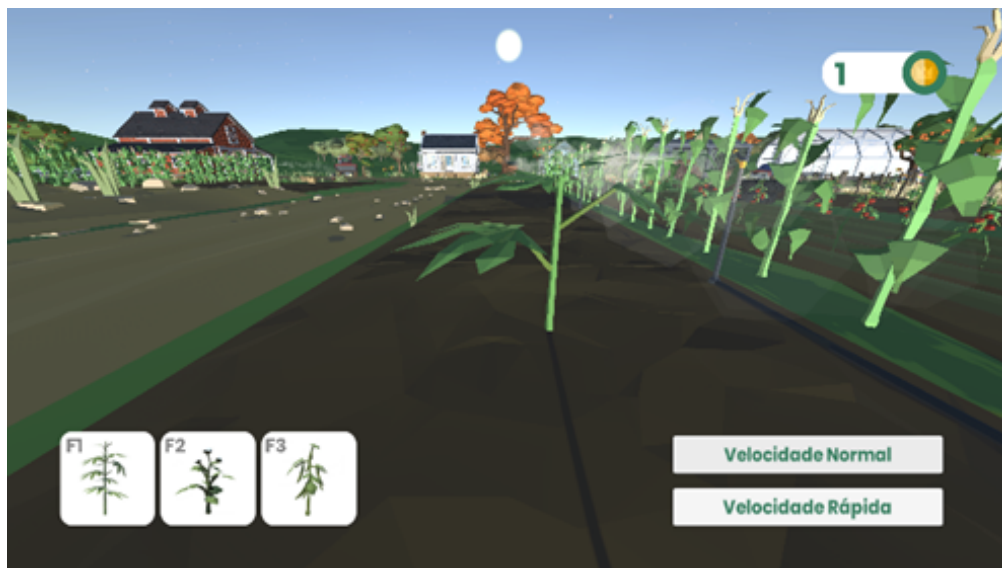
Farming-simulator project. Prototype of a crop-planting game.

The first prototype created for this project consists of a plant and grow game where the player needs to wait for the time to pass so they can start planting again. The *Little Farm Island* is focused on a simulation, the player takes the role of a new farmer and has to survive through the days only by planting food to eat and managing to find water, each of these necessities has a game bar, as well as a health meter to keep player aware and create a very focused gameplay element.

A serious survival game where the implications of failing these objectives will result in death or a game over where the player has to start again. Aims at understanding the player's needs and relatability of the real world, the environmentally friendly attitude often rewards the player, this instigates the user to have positive nature proficiency after the experience, using a 3D engine for this project will improve the creation of a more realistic experience to the user as shown in the article by Lauren Herckis, Jessica Cao, and Jacqui Fashimpaur study on virtual houses in games [14]. Experimenting with various game mechanics will lead the player to a better understanding of the game world, and this will help to smoother gameplay with different objects and interactions to discover. The game genre is set in the category of simulation, a farming survival adventure, the aesthetic used is based on low polygon art, since is relaxing and familiar to the player, and as for the developer, more accessible work with fewer meshes.

Little Farm Island first image: Early image of the game.

This game also needs experimentation for gathering data about gameplay elements and their paths, studying the user decisions in-game, and possibly facilitating some future fixes and tweaks on the gameplay based on the tester's experience. By studying user decisions within the game, it may be possible to identify patterns or trends that can inform future fixes and tweaks to the gameplay. This data can also be used to identify any potential challenges or barriers that players may encounter while playing the game, which can help to inform the design process and ensure that the game is as enjoyable and accessible as possible. Analyzing the results of the experimentation, it may be possible to determine whether players are able to learn and engage with these concepts effectively through the gameplay. This data can help to refine the game design and ensure that it is meeting its intended goals of promoting environmental awareness and teaching problem-solving skills. Experimentation can be a valuable tool for gathering data and feedback about *Little Farm Island* and can help to inform future updates and improvements to the game. By conducting careful and systematic experimentation, it may be possible to identify areas for improvement and ensure that the game is as engaging and effective as possible.

4.6 Game design and development

Game design are dependent on various things; gender could a factor as the age of the player. An article published in October 2019 about player characteristics and video game preferences by Gustavo Tondello and Lennart Nacke, studied game preferences based on different game choices, this one related to gender [18]. The games men mentioned often were *Call of Duty, Counter-Strike, Dark Souls, Defense of the Ancients, Overwatch, Rainbow Six, Rocket League*, and *X-COM*. On the other hand, games that were mentioned more often by women were *Dragon Age, Kingdom Hearts, Persona, Pokémon, Stardew Valley,* and *The Sims*. Based on this list, it seems that men are more attracted to intense, challenging, or competitive games, while women are more attracted to immersive and relaxed simulators, and social games.

Ages between 20 and 33 were part of this study, and it seems that strategy games such as *StarCraft, Civilization*, and *X-COM* generally appeal to an older audience. In contrast, first-person shooters such as *Overwatch, Call of Duty,* and *Counter-Strike* seem to appeal more to younger audiences. To create a game, the notion of gender preferences and age is essential, so for the creation of this environmentally aware game project, the more audience tries the game and tests it, the better results can be found.

According to the research cited in the article [15], games that include elements of danger or fault can increase player engagement and create a sense of player awareness. Based on this understanding, the target audience for *Little Farm Island* will initially focus on young adults and teenagers, as the game will include violent themes such as starvation and drowning, which may be more suitable for this age group. The setting of *Little Farm Island*, a small island, is conducive to exploration and loot-finding gameplay, as players can discover new items and resources as they explore the virtual world. Crafting and survival elements, such as the need to gather food and manage a health bar, can also create a sense of player awareness and encourage players to think critically about their actions in the game. By incorporating these gameplay mechanics, *Little Farm Island* aims to provide an immersive and engaging experience that promotes player agency and encourages players to consider the consequences of their actions.
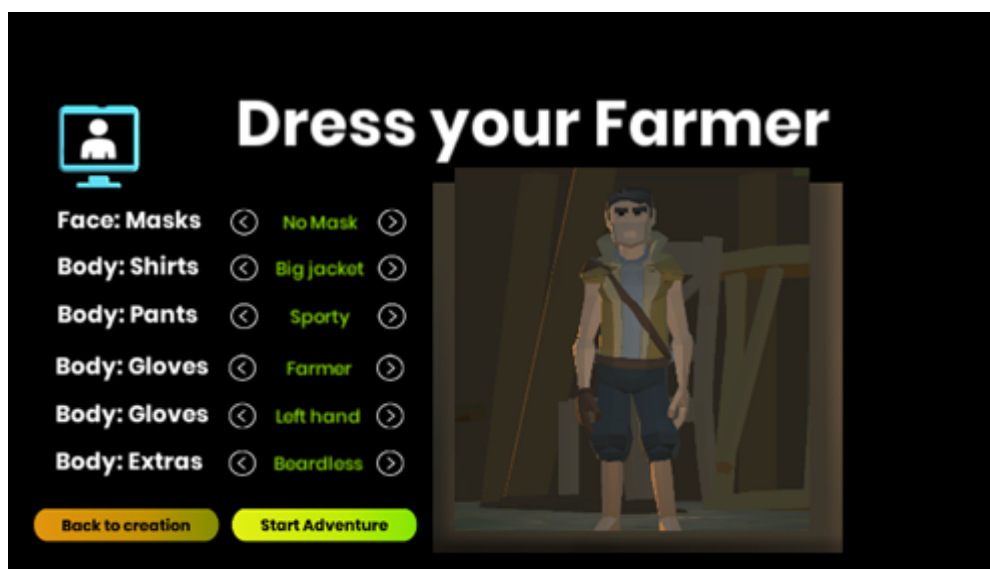
Little Farm Island customization: Dressing the farmer of your choice, mechanic.

In the development of this farming simulator game, one of the initial steps was to create a player character with simple dressing options using a low polygonal style to improve performance. This allows players to personalize their character and feel more invested in the gameplay experience. By offering a variety of options to choose from, players can create unique and personalized experiences, which can make the gameplay more engaging and enjoyable. This approach is important in the development of any game, as it helps to create a sense of competition and differentiation within the genre. By offering players a range of customization options, *Little Farm Island* can stand out from other games and provide a more immersive and engaging experience. This can be especially important in a crowded market, where it is important to offer players something unique and compelling to keep them coming back.

Little Farm Island buy menu: Buying and selling items in a garden shop.

In *Little Farm Island*, players can purchase items to aid in the planting of crops, such as a Gardenbox. These items can be bought and sold through a buying and selling screen. The game uses a currency system, with each item having a specific value. Players can interact with various vendors throughout the game world, each of which may have different prices and items available for purchase.

Some items, such as the Axe Tool, are essential for gameplay progression and can only be sold in a single quantity. These key items can provide players with new ways to interact with the game world and can be important for advancing in the game. The prices of these items can also impact the survival mechanics of the game, as more expensive items may require players to spend more time collecting money and surviving to progress. This can extend the gameplay and encourage players to think carefully about their actions in the game. Overall, the purchase and sale of items can be an important gameplay mechanic in *Little Farm Island*, as it allows players to make strategic choices and progress through the game in a way that makes sense for the gameplay experience.

Little Farm Island updated image: The current game world, scenario, and HUD bars.

The development will follow a process of iterative prototyping, in which the game is continually designed and refined through a series of playtesting sessions. This process allows for the gameplay to be tested and evaluated by players, and for changes and improvements to be made based on their feedback. Iterative prototyping is a common approach in game development, as it allows designers to quickly create and test prototypes of their game in order to identify any issues or areas for improvement. By conducting frequent playtesting sessions, designers can gather valuable data about how players interact with the game and can make adjustments based on their observations and feedback. This process can help to ensure that the gameplay is engaging and enjoyable for players and that it meets the intended goals and objectives of the game.

4.7 Unity

Unity [10] is a widely-used game engine that allows programmers, designers, and developers to create, manage, and develop new applications for a variety of platforms, including mobile and windows. It is a powerful and flexible tool that is widely used in the gaming industry and is especially popular among solo game developers and those interested in game development. One of the key benefits of Unity is that it is a free engine that can be used to create both 3D and 2D games, making it an accessible and effective choice for both beginners and experienced game developers. The Unity engine is regularly updated and has an active online community that is dedicated to suggesting fixes and improvements to the platform. This can be especially valuable for those who are new to game development, as it can provide a wealth of resources and support for learning and improving skills. As noted in the article by Yuexiang Su [20], Unity is a powerful tool for creating simple 3D games that are accessible to a wide range of computer users.

In recent years, there has been a growing trend of incorporating games into the curriculum of computer science courses as a way of increasing student engagement and retention, as well as teaching practical communication skills. However, as pointed out in the article by Paul E. Dickson [22], there can be a challenge in teaching game development to those who have never written a game. Fortunately, Unity is a relatively easy game engine to learn, and there are many online resources and tutorials available to help those who are new to game development get started.

The game industry can be challenging, especially for those who are attempting to create a complete game from scratch. Triple-A games are often developed by large companies that invest millions of dollars into a project. However, with the help of tools like Unity and the support of the online community, it is possible for indie game developers to create small games in a relatively short amount of time that can still have many of the features and aspects of professional games. As noted in the study by Leônidas S. Pereira and Maurício M. S. Bernardes [3], indie game development is more accessible than ever before, thanks to tools like Unity and the wealth of resources and support available online.

4.8 Game Creator

The Game Creator [17] is a Unity extension that provides a set of tools to help kickstart the development of a game. It includes a character, scripted visual languages, variables, and a complete save and load system. The content of Game Creator is available in the form of modular packages that can be used in a Unity project. This extension is particularly useful for artists and designers as it helps to overcome the programming barriers that are often encountered when creating a game in Unity. The standard programming language in Unity is C#, but the visual scripting solution provided by Game Creator allows for the creation of action sequences that are executed sequentially, making it easier for those who are new to programming to get started with game development.

In addition to providing a useful set of tools for game development, Game Creator also has a low learning curve and offers a range of shortcuts and improvements that can help to streamline the development process. As I worked on *Little Farm Island*, I found that the tools in Game Creator became easier to learn over time and provided new ways to approach problems and challenges in the development process. Overall, Game Creator is a valuable asset for designers and developers and can help to introduce new people to programming and game development.
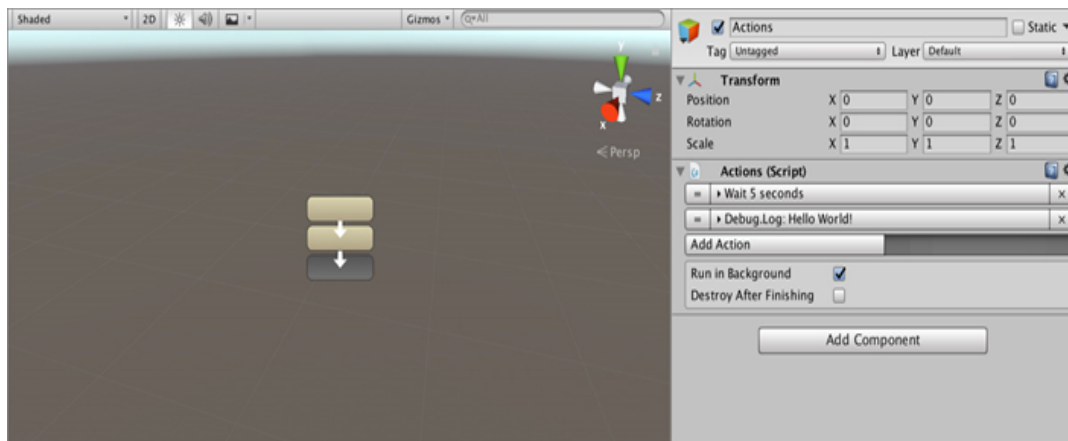
Screenshot of an action creation: Example of an action sequence on Game Creator.

Game Creator's visual scripting solution and range of tools can help to streamline the game development process, allowing the focus on creating and refining the gameplay and content of the game, designed to be accessible to those who are new to programming, making it an ideal choice for designers and artists who want to create games without needing to learn a complex programming language. Game Creator also includes a wide range of actions and tools that can be used to create a variety of gameplay mechanics and features. This extension has an active online community of developers who are available to provide support, answer questions, and share tips and techniques. This can be a valuable resource for those who are new to game development and seeking guidance.

4.9 Modeling a 3D World

The creation of the 3D world for my farming simulator game, *Little Farm Island*, was a process that required careful planning and consideration of various factors. To gather visual inspiration for the design of the game world, I created a moodboard that included a range of different images and ideas. I was particularly interested in creating a green, vast, and immersive world that would transport players into a virtual reality 3D environment, and was inspired by the natural beauty of my home island, Madeira, which was also based on the article [14] about the importance of virtual spaces to resemble the real place.

With the goal of creating a visually appealing and varied world that was in line with the game's narrative and gameplay, I focused on designing a green landscape with a large forest full of plants and trees at its core. To improve performance and streamline the development process, I chose to use a polygonal-based world design, which allowed me to use shaders and 3D polygons in a more efficient manner. The plain farm and surrounding environment with lots of green valleys were designed to allow players to create and interact with their own farms, while also promoting environmental awareness. To help players navigate the world and avoid distractions, I implemented invisible walls as a way to restrict access to certain areas. To disguise these boundaries, I incorporated unreachable mountains into the environment. Additionally, I included small towns where players could meet merchants and trade farm goods, as well as other elements such as trees, nature, and the sea, to create a more realistic and immersive world. The design of the world for Little Farm Island was carefully planned and thought out to ensure that it was visually appealing, immersive, and gameplay-oriented, and I believe that the result is a world that will captivate players and keep them engaged in the game.

Moodboard. Visual inspiration for the farming game Little Farm Island.

In the development process of my farming simulator game, the creation of the virtual world was crucial to convey a sense of immersion and believability for the player. To achieve this, I utilized a moodboard to gather visual inspiration for the world, which ultimately led to the decision to set the game on a green, expansive island reminiscent of my home of Madeira. The in-game world was designed with a focus on visual appeal and gameplay, with an emphasis on environmental awareness through the inclusion of a large forest filled with plants and trees. The inclusion of a plain farm and surrounding green valleys allowed for the implementation of player-driven farming gameplay. The use of a polygonal base for the world helped to optimize the use of shaders and reduce the number of 3D polygons used in the design of the scenery.

Scenery in Unity. Example of adding a tree prop to the game world.

In order to enhance the gameplay experience and provide smooth and seamless navigation for the player, I implemented the use of "invisible walls" as a means of restricting access to certain areas of the virtual world in my farming simulator game, *Little Farm Island*. These invisible walls serve as a boundary that the player cannot pass through, and are meant to direct the player's exploration and interaction with the game world in a way that is intended by the designer. In order to disguise these invisible walls and make them less conspicuous to the player, I utilized unreachable mountains as a means of providing a natural and immersive boundary for the player to encounter. This approach allows the player to easily navigate through the game world without being distracted or disrupted by the presence of visible barriers or obstacles.

4.10 Improvements based on user feedback

The gameplay is updated according to the user feedback data. This game is far from a full release, on a pre-alpha state is possible to adapt and change according to the player decisions gathered on the experimental setup. For most indie games that belong to small teams or are elaborated exclusively on solo development, is essential to understand what the players want, gaming is an experience that can be varied according to different kinds of persons playing it and for that critiques are helpful to improve on a game. In most games when getting ready for full public release, bug fixes, and optimization has to be in place, early reviews help to understand what went wrong and what to fix. The article [9] by Pejman Mirza-Babaei, Naeem Moosajee, and Brandon Drenikow mentioned the importance of playtesting for small studios, causing them to help identify and solve potential problem areas that may occur during the final stages of a project.

Little farm Island update example. Image demonstrating that is impossible to sell an essential item.

The above image shows an item, this Axe Tool is essential for progressing throughout the game, considering it a key element in the gameplay, makes sense that the player after purchase keeps it in the inventory assisting in completing the gameplay experience. Before the update, the player could sell this to vendors and wasn't able to receive it back, causing the game to fail its purpose and ending the further exploration experience, stopping the gameplay to this part. This gameplay correction is part of the feedback received by players that tested the game, is essential to have their opinions and improve on an already existing project, then the corrections made are significant and on a well-funded basis, which allowed me to fix this issue.

4.11 The DPE Framework

The Design Play Experience Framework (DPE) stands for design, play and experience for serious games. Marc Leblanc designed this framework as a method characterized by a simple and effective process for developers, scholars, and researchers alike. The designer creates the mechanics or formal rules for the game, these rules are influenced by the player's inputs and behavior in the game. Using several emotional responses of the player in the gameplay, the designer can see if a design of a specific part of the game needs to be modified or better polished.
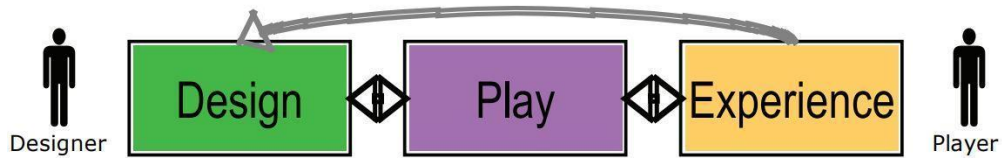
The DPE Framework process. The essencial design for serious game [27].

According to Winn [27], the use of a framework in the design process of a serious game can provide a common language for discussing the design methodology and can help to analyze the process of creating a game for learning purposes. In the case of my own game, *Little Farm Island*, the incorporation of user feedback and playtesting experiences is crucial in order to make necessary changes and modifications to the design, including elements such as storytelling, user experience, and the influence of technology. The grey arrow shown in the framework represents the influence of goals on the original design and the iterative process of testing a prototype of the game against those experience goals.

CHAPTER V

EVALUATION

This chapter presents the results of the questionnaire conducted with players of *Little Farm Island* and discusses the implications of the findings for the effectiveness of the game as a teaching tool. The chapter also provides a summary of the strengths and limitations of the game and suggests directions for future research and development.

5.1 Design Process and Measures

To create a methodology that allows the study of my research adequately, I constructed an organizational graph containing the application, on the videogame *Little Farm Island*, for computer users, which will allow me to test and experiment on willing players the amplitude of their gameplay experience felt throughout the process on playing my game. From the beginning to the end of the experience, analyzing which mechanics and gameplay elements need changes the most and updating them based on the answers to the questionnaire, made so players can express their opinions on the application, allowing me to on a later study construct a final build of the game.
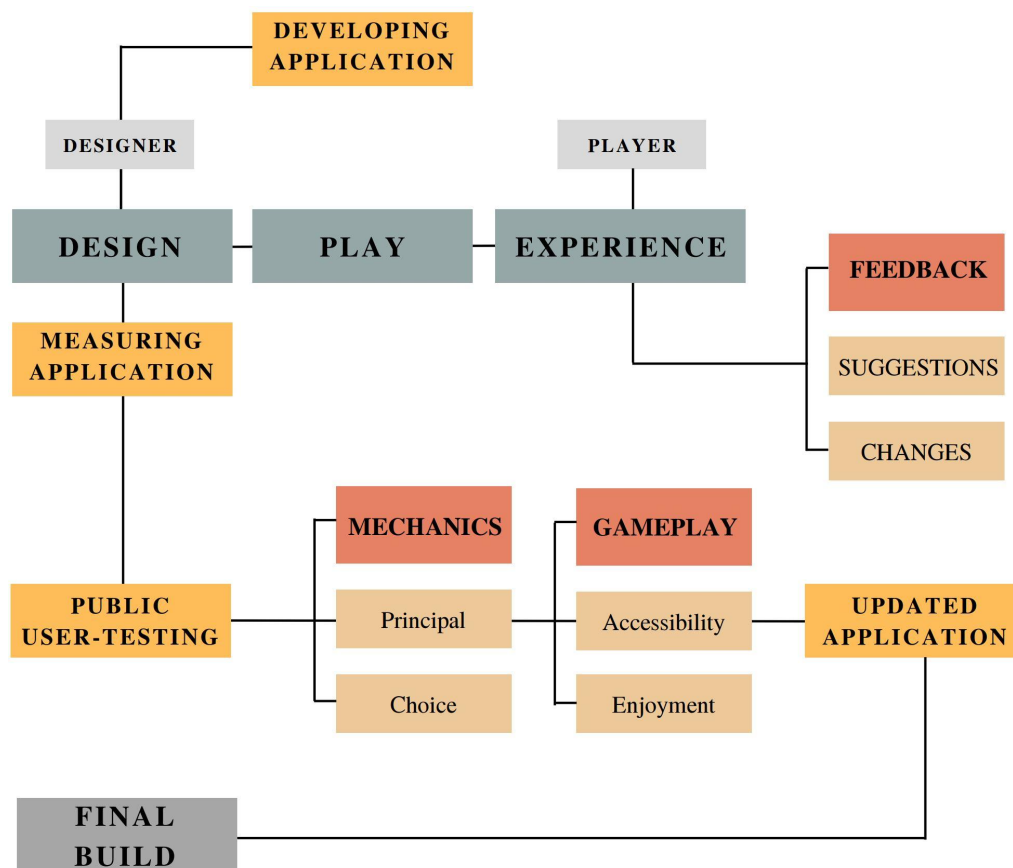
Organizational graph of the application study process. Used In the creation of Little Farm Island.

In the graph above presented, the starting point is the development of the application, using the 3D engine Unity, constructing compelling gameplay elements and a simple linear story in mind that will make sense on a simple user-friendly interface for a survival farming simulator game. The designer will start by designing the game, in which the solo developer will follow the DPE Framework process [27]. That said, the play has to be a part of the process, playing the game to understand if there are any bugs (e.g: broken gameplay, player getting stuck in the environment, glitches on game items) all of this is the core construction process. The developer can also experience the game as a player or invite a close friend to give an opinion on the game, and the feedback received will improve the overhaul experience. Suggestions are given to improve something that is either missing or can be made clearer to a player's perspective (e.g: item prices ingame, ways of getting around a place quickly) and the last one is the changes, pointing out something to improve is a great way to tailor a game to the player needs.

The next step is the measuring application, in which the information data is important to be extracted, that information can depend on various themes and forms of conception. In the game, is important to collect information based on the user-experience gameplay, on that note I divided it into two segments, the mechanics and the gameplay. Mechanics is the engine used to understand which ones are the most interesting to the player, the choice is the one I created to see if a player would interact (e.g: planting a crop to feed the player or eating plants to replenish missing hunger bar) the results varied depending on the player and their gameplay experience. The principal mechanics are those that make part of the gameplay, character creation is an option for the player but I defined that to be principal since most of the players wanted to have some customization to their character, either by curiosity or to feel more immersed in the mechanics' options presented in the game. The gameplay is about the user experience while playing the game, accessibility to measure if every player understands the gameplay and if it makes sense to them. The enjoyment is about the player's agency. If they felt some joy or sadness in a segment, relatable or not, the feelings going through the game, possible changes in behavior, and which parts are deemed more important or impactful.

The information collected on such data and elements is possible to create an updated version of the game, which can help me as a developer to improve the gameplay and all of the mechanics to be more aligned with the study. Lastly is the final build, this version is public for everyone to enjoy, only achieved through all of the data-gathering processes mentioned.

5.2 Participants Recruitment and Characterization

This Survey was conducted by 16 people that tried the game; which required tools, a personal computer with a Windows or macOS system, and an internet connection. Participants in this study are comprised of people that willingly participated in the questionnaire and are familiar with games in some ways. The game features some violent themes like starvation and death animations, that said, participants must be adults. In this particular user-testing experiment, players' age ranged from 18 to 45 years old. Most people worked and studied, 75% of them male and 25% of them female, so this genre of game, survival farming sim sandbox game, is well suited to males.

The questionnaire was mostly anonymous, but the ability to write and review the experience in the comfort of their own personal computer was facilitated through online social apps. From the information presented in the final result, is possible to affirm that some reviewers have academic backgrounds, and some are acquaintances from different backgrounds. The game is playable online, on a website where all of the testers had the ability to play at their own pace, and the conclusion of the test varied for each person.

5.3 Experimental Setup

Based on the article "Creating choices for the player by Tula Eriksson" [26] a questionnaire was created to help in giving a satisfactory answer to my main research question, based on the experimentation by user gameplay experiences, this one being the main focus of this setup: "Will different game mechanics applied to a simulator game improve the player's agency?". To better measure how I answer it, play testing needed to be conducted, and the need to have different kinds of players of varied ages and genres was essential. The elaboration of this questionnaire had different types of people doing it voluntarily, those being scholars, full-time workers, and those that are unemployed. (On this URL the game is playable on a personal computer web browser: Little Farm Island. All of the answers were sent and stored on this website, accessible by the site: Google Forms Questionnaire).

The questions were divided into three parts: a general questionnaire, where I wanted to know better about who is the person that is being interviewed, mostly knowing the age and gender. The general feedback of the experience is if the player would give this game a second playtest. If their own actions had an impact on people, this one keeping in mind an environmentally aware mindset. If a player selected that the farming simulation was not meaningful it was possible to justify using free text to write. The specific choice questions were the ones that answered my research question. If the mechanics in the game felt essential, what actions were most interesting, and whether a farming mechanic was or not important for the gameplay experience? In addition, asking the player, "were you happy with the action options available in the game?" By targeting the questions to the mechanics and gameplay part of the game I could gather better information than just asking general-type questions. Interview questions, this focus on the player's experience, and opinions, of what was the most important moment, the laziest task in the game, or if the player encountered some difficulties while playing.

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In the final question there is an improvement question, what would you improve, this one focus on what the player would suggest doing or adding to this project, different opinions are what create the most important changes in the future. Here are the questions made in the questionnaire:

General questionnaire questions:

What is your gender? How old are you? Would you play this game again?

If not, why? (Free text) Did you feel that the actions you made in the farming simulation game were meaningful to you? If you selected no, Why did they not feel important? (Free text).

Specific choice questions:

Did the planting mechanic feel essential for the conclusion of the game? Did buying items helped you in the long game? Was there any action in the game you found to be especially interesting in any capacity? (Free text) Did you feel that eating plants helped in the survivability of the character? Character customization helped to immerse you into the game world? Were you happy with the action options available in the game? If you selected no, what action options would you have liked? (Free text).

Interview questions:

 What did you feel was the most important moment in the game? (Free text) What was the most boring task in the game? Did you have any difficulty while playing? (Free text) Lastly, what would you improve in the game? (Free text).

5.4 Results

These results serve to answer the RQs, especially to understand if the user felt a great sense of agency in the gameplay experience and define what the best mechanics in the game are, mentioning also if those mechanics implemented helped achieve that through gameplay. This questionnaire was created on *Google Forms*, in which was possible to create several types of graphs for this study (e.g: pie charts, and column charts).
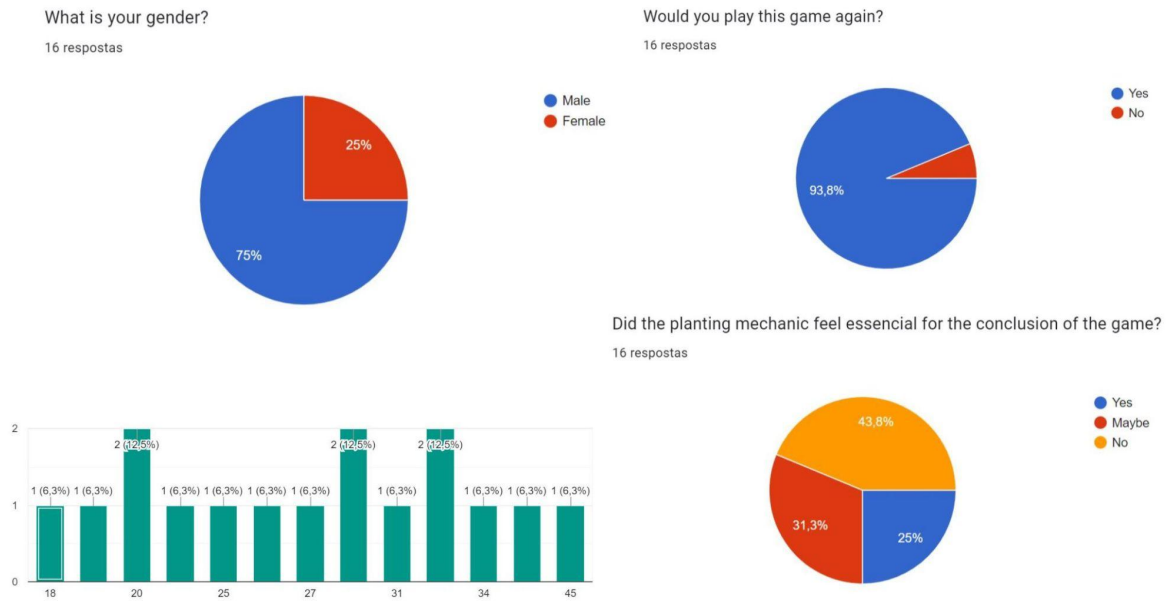
Testers and genre types. Questionnaire survey data results from Little Farm Island.

The players ranged from 18 to 45 years old, there were also 2 people each, the ages: 20, 29, and 33 on this questionnaire. On the question "would you play this game again?" 93,8% said yes compared to 6,3% who said no, showing it was only 1 person out of 15. The impact of the game on the person playing was measured if the game was meaningful or not, 75% said yes with 25% choosing no. Those who selected no had to answer a question, "why did they not feel important".

Players talked about their experience with the movable objects/items in the game, not making a firm point that is much relevant to the study itself. The pie chart referred to the planting mechanics in the game, was it or not relevant for an endgame? 43,8% said no while the other 25% said yes. 31,3% answered maybe, making it a good consideration for a future game update. The DPE (Design, Play, Experience) Framework [27] could potentially be used to consider how to improve the game's mechanics and design in order to enhance the player experience
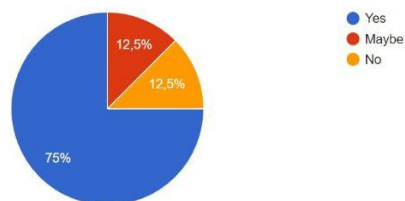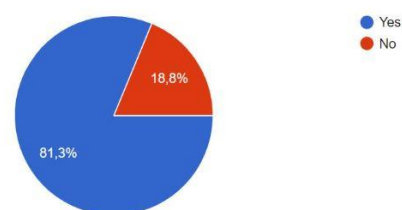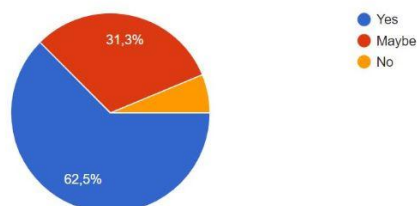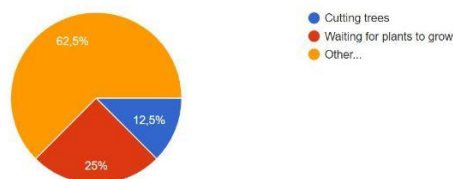
Immersiveness and options. Questionnaire survey data results from Little Farm Island.

The majority of people answered that buying items helped in the gameplay, about 63,25%, being that you can't pass the game without buying some key items. In that aspect the question "What was the most boring task in the game?", this one serves to understand what would players choose, 25% said that waiting for plants to grow is pretty tedious, 12,5% have the opinion that cutting trees was boring, while 62,5% the majority choose the option other. The other was a way to measure the scope of people that opted for a free text, where they can express their opinions by writing. Those were mostly; finding money throughout the game is boring, surviving is hard, walking on the map is long and tedious, the tutorial makes the game boring, and some refer to the dynamic of the game itself. Those criticisms are necessary not only to improve the quality of the game but to understand what can be improved from gameplay and from a storytelling perspective.

"Was there any action in the game you found to be especially interesting in any capacity?". This question serves as a measuring tool for testing the mechanics in the game compared to the other games in the market; innovation and originality are what make an application or videogame stand out. The answers were scaled around farming simulators, day and night cycles, collectibles, and some others. On a pie chart the question "Did you feel that eating plants helped in the survivability of the character?" analyzed how the gameplay was based on the survival elements present in the game, eating plants is part of the gameplay and crop mechanics, while 50% said yes, 43,8% said no, leaving 6,3%, better estimating that one play-tester said no. "Character customization helped to immerse you into the game world?". This question was answered with a 75% yes, meaning that when creating something the player will be invested in the character and this is important for the player's immersion in a game, creating a roleplay-like feel to it.
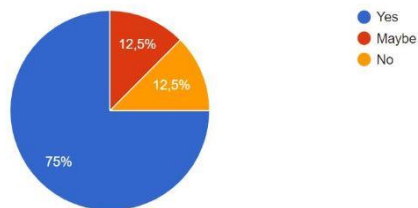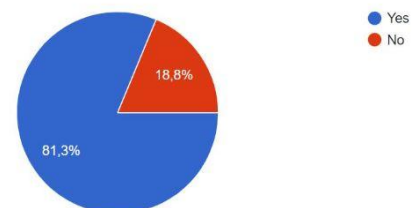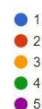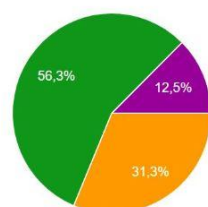

Difficulties and mechanics. Questionnaire survey data results from Little Farm Island.

Overhaul happiness based on the action options in-game, 81,3% said it was good and 18,8% said no. When some selected no I asked to justify the answer, the issues were about the survival mechanics getting way too soon from a gameplay perspective, maybe the use of more progressed and simple relaxing activities to immerse the player in the early game. For this part of the questionnaire, some questions needed to be answered by the game testers. "What did you feel was the most important moment in the game?"; this question is derivative to understand in what part of the gameplay was the mechanic more memorable to the player. If there was a part of the storyline that a tester retained the most.

Most players said, at the moment where they got the axe in a shop, this is a key item needed to advance to the next section of the map, otherwise the game progress is locked, so makes sense why players would refer to this particular part. Buying a Gardenbox to allow the player to plant and grow their own crops is essential, there was one answer referring to this one, but most of them continue to be about the axe, also one crucial moment for a tester was referenced about cutting the first tree with this axe. As the difficulty while playing questions, I realized a pattern, in the beginning, there were hints on boards for first-time players to know how to play but there is a great learning curve evolved to it. This was done on purpose to realize how invested a player is in the gameplay itself to continue trying to find new ways to survive and reach the end of the game. Most players had the initial difficulty but overcame it to enjoy the full experience and explore all the content available in the game.

Improvement and rating. Questionnaire survey data results from Little Farm Island.

Players rated the game positively after the gameplay giving a score of 4 out of 5 on a scale, about 56,3% of the votes. For updates and future development of the game, the question: "Lastly, what would you improve in the game?". This one is about criticism and constructive reviews, so I can add them to a possible update on the game itself. One of the most elaborated reviews said the following:

"First thing is to put the inventory smaller because the player won't have enough space to use drag and drop mechanics while using the inventory, for example, while planting or cutting trees with the axe, the size of inventory makes it difficult. The hitbox of the objects should be bigger (eg. the plants can only be picked in the middle). The food and thirst meters decrease too quickly. Sleeping should be allowed, to restore health and food or thirst. Dying don't have any repercussions, so you can easily die and save money by doing so."These types of reviews help the publisher and game designer to improve the game, as now I can focus on correcting all of the stated above issues, is pretty much impossible to create a perfect game even with dozens of outside funding and even harder for a solo developer.

5.5 Discussion Results

Based on the results of the thesis questionnaire, the game mechanics implemented in the game were generally well received by players. Many respondents reported that they enjoyed the sense of agency and control over their actions, and found the mechanics that required problem-solving to be engaging and challenging. Additionally, several respondents mentioned that the game's focus on environmental awareness was a positive aspect and added to their overall enjoyment of the game. However, there were also some areas for improvement identified in the questionnaire responses. Several respondents mentioned that the game could benefit from more varied and interesting gameplay mechanics, and some found the game to be repetitive or lacking in challenges. Additionally, a few respondents mentioned that the game could be improved with better graphics and sound design, to enhance the overall immersion.

Can be concluded that the game was successful in engaging players, promoting environmental awareness and problem-solving skills through its gameplay. 93.8% of players said they would play the game again, and 75% felt that the game was meaningful. These results demonstrate that *Little Farm Island* was able to capture the attention and interest of players and provide a positive and educational experience. There were some areas for improvement identified through the questionnaire, such as the relevance of the planting mechanics for an endgame. 43.8% of players said that the planting mechanics were not relevant, while 25% said they were relevant. 31.3% said maybe, indicating that further consideration should be given to how these mechanics could be refined or improved in a future update to the game. The results of the questionnaire show that *Little Farm Island* has the potential to be a successful tool for promoting environmental awareness and problem-solving skills through engaging gameplay. These results can be supported by statistical and numerical data, such as the percentage of players who said they would play the game again and the percentage who found the game meaningful. The questionnaire suggests that the game mechanics implemented were generally effective in creating a more immersive experience, but there is also room for improvement in terms of variety and challenge. Further work on the game could focus on incorporating additional mechanics and features to enhance the player's sense of agency and challenge, as well as improving the game's graphics and sound design.

CHAPTER VI

CONCLUSION

This chapter summarizes the main contributions and findings of the project and reflects on the potential and challenges of using games as a teaching tool in educational contexts. The chapter also provides recommendations for the use and improvement of *Little Farm Island* and similar games in the promotion of environmental awareness and problem-solving skills.

7.1 Conclusions

In this thesis, is presented the motivation for creating an independent game and the importance of bringing an immersive and engaging game experience. Discussing the use of game mechanics and the concept of agency, or the player's sense of control over their actions, in creating a more immersive game. Describing the process of creating the game, including the development of various mechanics and the use of a questionnaire to gather feedback from players. This paper concludes by discussing the potential benefits and applications of the game in promoting environmental awareness and teaching problem-solving skills. This research aimed to answer the first research question on game mechanics, the question mentioned focuses primarily on a set of various game tools as part of the existing gameplay of the survival game developed for the project. The game named *Little Farm Island* was designed as a serious game that helps a player navigate through a world using resources and interactive elements. The aspect of different game mechanics implemented in this application was purposely designed to give players a sense of agency with some features, and elements beyond survival (e.g. creating a character, collectibles, buying furniture).

In my research context, I came across an article by Bride Mallon, mentioning that carefully created game mechanics can make a player feel a great sense of agency [11]. Game designers use several technics to make a game functional, including taxonomy, to organize aspects and features to create in their future games. Based on a moodboard I was able to create a visual game world based on that, a low-poly colorful world for attracting players of all ages not being restrictive. After several trials and errors on the creation of the game, on the solo developer aspect, various experimentation, and numerous web versions, the final project implementation of the game *Little Farm Island* was created.

With this, a questionnaire was also planned to help understand the player of the game, the genre, motivations, and the game experience itself. Through careful analysis, I was able to reach my conclusions, based on the quantitative and qualitative analysis mentioned in the questionnaire by the play-testers responses. Ryan Alexander and Chris Marten's article [12], mentions that some of the most interesting quests in a game can come from the player side, while engaged in good immersive gameplay, not necessarily referring to a structural line to trigger them, those create the most genuine game experiences. The contribution of this thesis reinforces the research work done throughout the paper, demonstrating the importance of game mechanics in creating a more immersive game experience. The findings of the research suggest that the use of various game mechanics, such as those that enhance the player's sense of agency and provide opportunities for problem-solving, can significantly contribute to a more engaging and immersive game.

In addition to addressing the research question, this work also has the potential to extend beyond the scope of the original question. For example, the findings of this research could be used to inform the design of future games, helping game developers to create more engaging and immersive experiences for players. Additionally, the use of game mechanics to promote environmental awareness and teach problem-solving skills could also have potential applications in education and other areas. Overall, this research has the potential to contribute to a better understanding of the role of game mechanics in creating immersive game experiences, and could have a broader impact on the field of game design and development.

Giving the player different game mechanics applied to a simulator game improves significantly a player's agency experience. Character customization helped 75% of the 16 testers say yes to a question that mentioned how this extra feature in the game helped immerse a new player in the game world. Just dropping a character in the middle of scenery with no context and minimal emotional attachment could drop the player's immersion, therefore the sense of agency. The article by Gustavo Tondello and Lennart Nacke helped to understand that gamers have different tastes in the game mechanics based on gender, girls are more inclined to play casual games while boys are more into competitive games overhaul [18]. These studies helped to shape the final build of the game, the notion of player preferences is important for its creation being what a gamer is looking for in a game. Another important aspect is to understand that players judge a video game based mostly on the gameplay mechanics itself, only after the game "is not new" that a player can starts to lose interest [21]. Captivating gameplay and exploration are key for new players to become focused on the game, using various elaborated features and different kinds of interesting mechanics is possible to make a player focus on this particular survival-farming simulation game, improving the player's agency.

The research question "Can different game mechanics bring more immersion to a game?", can be concluded that the use of various game mechanics can indeed contribute to a more immersive game experience. This can be achieved through the use of mechanics that enhance the player's sense of agency, or control over their actions, and provide a sense of interaction with the game world. In addition, the use of mechanics that challenge the player and require them to think and problem-solve can also increase immersion. Overall, the careful selection and implementation of game mechanics can play a critical role in creating a more immersive and engaging game experience for players.

7.2 Future Work

Further research is needed to determine the causes of a player's agency in the game, focusing on what is the individual source of the cause, knowing in what aspect the player becomes truly immersed in a game may vary for each person but finding a satisfactory common ground can be possible to achieve on future studies. What can cause a player to choose to do certain activities instead of others could be explored, in the game (e.g: cropping, planting, buying, and picking up flowers). Does a player favor some other game activities than those mentioned? There is a lot to explore in such a context. Another mention that is indeed important, is the development of the game, there is a lot that can be added or updated in *Little Farm Island,* glitches, and fixes are important for any type of game, and this one is no exception. The article of Paul E. Dickson [22], mentions that creating a game using technology not familiar to a first-time developer is naturally difficult, but as experimentation and interest build up, the challenges get easy and the developer finds new tools to work with. An indie game is never truly completed by the various amount of glitches or bugs present in the game, these being; the save and load options not working correctly, placing furniture in impossible places on the scenario, and many others. Using the user feedback on the questionnaire is possible to improve the aspects that players consider worth a change; in a future project, some of the criticisms that were given could be a valuable resource to improve the game, the sense of agency, and the different game mechanics. The gameplay can be influenced by the player's inputs and behavior on their experience with it, sharing those results is important for a game designer as for a solo developer, motivating and even gaining more experience on how to perfect it.

Overall, this thesis provides a thorough and well-structured description of the game development process and the potential benefits of the game. Some potential areas for improvement in future work could include providing more detailed information about the game mechanics and how they contribute to the overall game experience, as well as discussing the potential challenges and limitations of the game. Additionally, it would be interesting to see a more in-depth analysis of the feedback from players, including any trends or patterns that emerged from the questionnaire data. The thesis provides a solid foundation for future work in this area.

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