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Development and Analysis of a Game Design Methodology applied to the Game *Honor Keeper* Conception

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Abstract: Game design is a challenging activity that necessitates expertise and competencies from various domains. Teaching new designers involves grasping and implementing methodologies, integrating them into a particular design context, which proves to be a demanding yet essential task. In this paper, we report an experience in the conception of a game where two methodologies were analyzed and combined to describe a process with well-defined sequential activities. To verify the results with the application of this methodology, the developed game was made available for testing with real users, together with a questionnaire that sought to analyze the players' level of satisfaction with the main aspects of the game. Based on the feedback and examination of responses from test participants, it was evident how adjusting and implementing the method positively influenced the game project in an organized and unified manner, leading to a favorable reception from users.

Keywords: Game, Game Design, Schell's Lenses.

1 Introduction

The game development industry is experiencing significant growth, being considered one of the largest markets today. In early 2024, a study conducted by Statista[1] analyzed the value of the electronic gaming industry, which was assessed at US$396.2 billion, surpassing the combined value of the music and film industries. To meet the demands of this market, game development companies require a specialized team capable of working collaboratively. Within these companies, there are various areas responsible for different aspects of a project, necessitating professionals capable of handling the diverse activities of Game Design.

Game Design can be seen as the most creatively demanding area in game development, as it involves deciding what and how a game should be [Schell, 2019]. This field entails the creation of stories, characters, objectives, rules, and compelling challenges that promote interactions with other players, characters, or objects [Stefyn, 2019]. The diversity of activities involved in Game Design requires professionals with different skills, making the work of designers highly complex. While there are methodologies and techniques designed to support the various activities of Game Design, training professionals capable of understanding these methodologies, selecting viable activities and techniques, and adapting them to their contexts and needs is a challenging and necessary task. To develop professionals with these capabilities, it is necessary to experience the process of conceiving a game, including dealing with design challenges, studying, and implementing a methodology that can support this process.

This paper is an extension of the study presented by Vitor *et al*. [2023] which discusses an experience in designing a game using a Game Design methodology. In addition to the Game Design, in this article, the authors also present details about the development and evaluation of that game. In this study, the specific methodologies for Game Design discussed by Schell [2019] and Rogers [2014] were analyzed and applied together, which proved to be more suitable for the conception of the game *Honor Keeper: Between Blood & Sacrifice*. The authors identified a complementarity between these approaches: while Schell [2019] has a more open approach to Game Design, Rogers [2014] proposes a more pragmatic approach focused on game development. Both approaches are flexible in sequences of steps and activities, making it feasible to combine them in the context of this study. Figure 1 illustrates the game developed.

Figure 1. Illustrative image of the game *Honor Keeper*.

As the main contribution, this paper demonstrates how the approaches of Schell [2019] and Rogers [2014] were combined, resulting in a methodology with a well-defined sequence of steps. Analyzing the game project through the application of this approach, it was possible to detect that the combination of both supported the understanding of processes and activ-

[1] `https://www.statista.com/topics/868/video-games/#topicOverview` (Last access on 11 February 2024)

ities of Game Design, enabling the design and development of a complete game according to the project needs. In this way, the proposed approach can support the professional formation of students working in this area.

The remainder of this paper is structured as follows: Section 2 presents the theoretical background that underpins the study; Sections 3 and 4 present, respectively, the methodology and the development of the game applying the Game Design methodology in the conception and implementation of the game *Honor Keeper*; Sections 5 and 6 present the results through game testing and the analysis of the research results; and finally, Section 7 presents the conclusions of this research and directions for future works.

2 Theoretical Background

A good Game Design methodology is crucial to create a complete, structured, and well-founded game. These methodologies typically cover various activities, from understanding the target audience of a game to evaluating player experience and possibilities for improvement [Tondorf and da Silva Hounsell, 2022].

There are many definitions for Game Design as "*Game Design is the act of deciding what a game should be*" [Schell, 2019, p. xxxvi] or "*Game design is narrowly defined as the creation of the interactive elements of a game, the rule sets, the gameplay dynamics and systems that run the input-output loop of any game experience.*" [Wolf and Perron, 2016, p. 105]. Another perspective considers that "*Game design sits under the broader field of video game development and refers to the use of creativity and design to develop a game (...). It involves creating compelling stories, characters, goals, rules, and challenges that drive interactions with other characters, users, or objects.*" [Stefyn, 2019].

In this paper, the process for conceiving a game defined by a system or a series of interconnected challenges where players engage in artificial conflicts, interacting with each other or with the environment in simulated environments with well-defined rules and mechanics is described [Rollings and Adams, 2003; Salen and Zimmerman, 2004].

A designer must know all the details of their game, from the creation process to its composition, aiming to avoid difficulties when solving potential problems. To do this, one must understand the basic elements of a game and how they relate, which can be seen in the Elemental Tetrad, presented by Schell [2019]. It includes the elements: mechanics, story, aesthetics, and technology. Mechanics define how the player interacts with the rules of the world, while the story shows the sequence of events involving plots, mechanics, and characters of the created world. Aesthetics, the most visible element, involves the presentation of the game, such as appearance and sensations to be caused in the player aiming to lead them to immersion. However, the possibility of experiencing the developed game is only possible through technology, often invisible to the player. The designer is responsible for conceptualizing all elements of the game to deliver an experience for the player, but there are game factors belonging to other areas of development, beyond the designer's competence, such as aesthetics, with artists, and audio with audio designers. Therefore, the final word on such factors lies with those competent in those areas, with the Game Designer only serving as an initial point of ideation exposing to them the experience to be conveyed.

As aesthetics are the most visible element, it can be said that a good interface is fundamental for the success of a game, promoting a feeling of control to the user. According to Schell [2019], the main elements of the interface between the player and the game world are: physical input, physical output, and the virtual interface. The player interacts with the world through physical input, for example, by moving the analog sticks of a controller to trigger the movement of a character, while physical output allows the player to visualize part of the world. The virtual interface maps actions and interactions that can be performed by the player using the controller. This interaction has effects from the game world and vice versa, meaning changes and events in the world also manifest in the player's interface through physical outputs, such as the screen.

Thus, when deciding to create and develop a game, a Game Designer should use a Game Design methodology that supports them in the game conception process. The literature presents the description of several Game Design methodologies such as: Hunicke *et al*. [2004]; Godoy and Barbosa [2010]; Xavier [2013]; Cardoso *et al*. [2018]; Xavier *et al*. [2020]; Matos *et al*. [2021]; Mangeli *et al*. [2021]; Silva *et al*. [2023]. Among existing methodologies, those presented by Schell [2019] and Rogers [2014] stand out for their characteristics and differences. While Rogers [2014] has a more objective and direct vision, Schell [2019] presents a more open approach to the creative process, introducing, for example, the concept of lenses: **Schell's lenses**.

In this article, Schell's lenses are used as tools to raise a set of pragmatic questions capable of arousing different perspectives to analyze games in development. According to Schell [2019], there are 113 lenses available, which were created to be used in all types of games, but not all are relevant depending on the game being designed. Therefore, in Section 3 of this work, only the lenses that applied to the design challenges and experiences created in the conception of the game *Honor Keeper* are presented.

The adoption of Schell's lenses can be defended for their subjectivity, ease understanding and use, and application flexibility. While the adoption of Rogers [2014]'s structure, it can be defended for its objectivity, segmentation based on industry standards in game development, and documentation models. Excellent support tools for those who are still developing their own method and design style, thus thinking, reflecting, and applying concepts that are relevant to them.

3 Methodology

To develop the Game Design of the game *Honor Keeper*, methodologies from Schell [2019] and Rogers [2014] were used as references. These methodologies were combined, selecting a sequence of steps for the design of the game in question, as illustrated in Figure 2. For each step, certain elements from these methodologies were considered, summarized in Table 1 and detailed further in this section.

Table 1. Defined stages for Game Design, highlighting the elements of the methodologies used in each stage.

Stage	Elements proposed by Rogers [2014]	Lenses of Schell [2019]
Brainstorming	Pillars of the Production Process	Emotion, Essential Experience, Fun, Resonance, Infinite Inspiration, The Player, Action, Skill, Moments, Fantasy, Atmosphere
GDD	The One-Sheet, The Ten-Pager e Beat Chart	Documentation, Venue, Elemental Tetrad
Game Story	Not Applicable	Surprise, Problem Solving, Unification, Novelty, Obstacle, The Hero's Journey, Story, Help, The World
Level Design	Player and Enemies Initial Location, Doors and Gates, Puzzle Elements, Treasures, Traps, Chests and Collectables, Important Places	Curiosity, Flow, Time, Inherent Interest, Indirect Control
Character	Not Applicable	The Avatar, Character Function
Camera	Movement and Camera Control, Avoiding Collisions, Camera Movement and Obstructions	Risk Mitigation
Control	Ergonomic Hand Map of a Player	Imagination, Skill vs. Chance
Combat	Block, Parry, Strong and Light Attacks, Finishers	The Eight Filters, The Toy, Pleasure, Challenge, Triangularity, Punishment, Modes, Playtesting
Interface	Not Applicable	Control, Physical Interface, Virtual Interface, Transparency, Feedback, Juiciness
Enemies	Size, Behavior, Speed, Attacks	Not Applicable

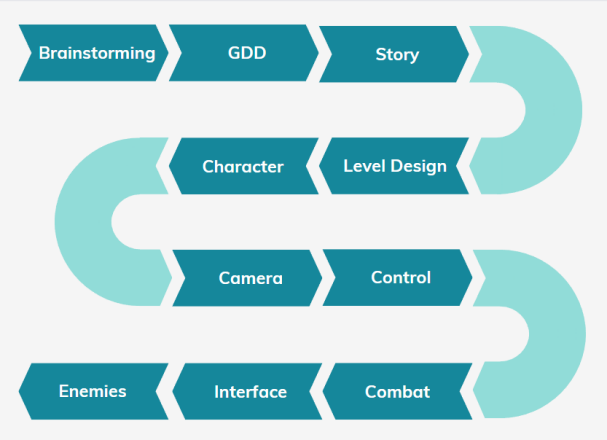

Figure 2. Steps' sequence proposed for the process of Game Design.

At the outset of the game conception process, all involved parties should actively engage with ideas and concepts. The idea is to promote team connectivity to propel the game forward through collective commitment [Carneiro *et al.*, 2022]. For this, in the Brainstorming stage, it was considered the use of eleven Schell's lenses, as outlined in Table 2.

Table 2. Usage of Schell's Lenses in the process of Brainstorming.

Lens	Reason of Usage
Emotion	Identify the emotions players can feel
Essential Experience	Identify the Game's Experience for the player
Fun	Identify the Game's Fun Elements
Resonance	Understand what should spark interest in the game
Infinite Inspiration	Understand how to convey experiences lived by great heroes
The Player	Identify the target audience and their expectations
Action	Understand the possible actions within the game and define elements with different gameplay
Skill	Understand the skills that the player must have
Moments	Understand key moments in the game and how to make them more powerful and interesting
Fantasy	Identify the fantasies provided by the game
Atmosphere	Identify what the game atmosphere should be like, taking into account the target audience

Brainstorming needs to be an enjoyable process, which can be achieved through certain pillars of the production process such as: appreciation of ideas without judgment, idea documentation, sketching, immersion, collaboration with peers, and adopting various perspectives [Schell, 2019; Rogers, 2014]. After this stage, more refined ideas emerge, which can be encapsulated within the Game Design Document (GDD).

The GDD is crucial for keeping the game development well-documented, enhancing team communication and organization. Rogers [2014] outlines a framework for creating a comprehensive GDD, consisting of a beat chart and two documents: one providing a concise and quick overview of the game with engaging and informative content on a single page, and another document with ten pages offering a more detailed insight into the game. The beat chart, in turn, serves as a vital resource for GDD writing, acting as a map of the game structure capable of summarizing the developed scenarios and their features. At this stage, the utilization of three Schell's lenses was also considered to aid the team in GDD elaboration, as described in Table 3.

Table 3. Usage of Schell's lenses in the elaboration of the GDD.

Lens	Reason of Usage
Documentation	Define the elements that would make up the game documentation
Venue	Identify the types of places where the target audience likes to play and how to create elements to compose these places
Elemental Tetrad	Use its elements (mechanics, story, aesthetics and technology) to add relevance and completeness to the game

In the narrative, the storyline of the game is defined to immerse the player in the context. At this stage, nine Schell's lenses were utilized, as presented in Table 4.

From the storyline, one can weave the tale of the world, interconnecting its elements, dispersing collectible items and secrets, scattering enemies, and placing objects within the environment.

Table 4. Usage of Schell's lenses in the story creation.

Lens	Reason of Usage
Surprise	Create possible elements of surprise for the player
Problem Solving	Identify the problems that the player must solve, and how to make them interesting
Unification	Understand which elements of the game interact
Novelty	Identify the biggest new feature in the game and how to make it more evident
Obstacle	Identify the main character's relationship with the obstacles and elements of her journey
The Hero's Journey	Adapt the Hero's Journey to improve the game narrative performance
Story	Identify the need for the game to have a story and how it should be structured
Help	Define who the character helps in the story
The World	Identify how to create the world to support all pillars of the game

According to Schell [2019] and Rogers [2014], Level Design is a grand composition of visual and collectible elements, alongside structures and interaction elements. In this stage, in addition to the elements proposed by Rogers [2014], the employment of five Schell's lenses was also considered, as described in Table 5.

Table 5. Usage of Schell's lenses in making the Level Design.

Lens	Reason of Usage
Curiosity	Identify the questions that the game raises in the player's mind and how to make him care
Flow	Identify whether the objectives defined for the game are clear and whether they are the same as those expected by the player
Time	Identify how the player would react to the amount of time needed to complete the game
Inherent Interest	Identify aspects of the game that capture player interest
Indirect Control	Identify the actions the player should take and how to do it

Characters serve as the gateway for players to enter the world; in other words, it is through them that each player can experience sensations and live stories completely different from the real world [Schell, 2019; Rogers, 2014]. Their significance spans from physical to psychological realms. For a character to function optimally, it should reflect elements that elucidate its traits, abilities, personality, relationships with the world, and gameplay. At this stage, two Schell's lenses were employed, as depicted in Table 6.

Table 6. Usage of Schell's lenses in creating characters.

Lens	Reason of Usage
The Avatar	Identify how the character should behave
Character Function	Identify which roles each character should perform within the game

An efficient camera system is necessary for the player to have a good sense of character control. The more control the player has over the avatar, the greater the feeling of power. Thus, the camera becomes one of the most important elements of the game, as the player will interact with it at all times, both in battles and explorations [Rogers, 2014]. Another equally important element is the game controls that connect the player to all other elements such as the screen, the visual reproduction device, and the location where the game is running. A well-structured button scheme can be a decisive factor for the acceptance of the target audience, requiring a considerable understanding of the elements that make up the control and the interface [Rogers, 2014; Schell, 2019]. In the camera development stage, the use of a Schell's lens, *Risk Mitigation*, was considered, and in the game control structuring stage, two other Schell's lenses, *Imagination* and *Skill vs. Chance*, were used. The reason for using each of these lenses is presented in Table 7.

Table 7. Usage of Schell's lenses in the process of creating cameras and controls.

Lens	Reason of Usage
Risk Mitigation	Minimize camera-related issues
Imagination	Identify what understanding the player needs to acquire to play the game
Skill vs. Chance	Assist in mapping controls in order to reinforce the main characteristics of games of this genre

Understanding the camera system and game controls allows the design of combat mechanics. In an action-adventure game, combat must be developed with mechanics capable of supporting the theme, in order to bring unique experiences to the player. At this stage, in addition to the elements proposed by Rogers [2014], the use of eight Schell's lenses was also considered, as described in Table 8.

Table 8. Usage of Schell's lenses in combat development.

Lens	Reason of Usage
The Eight Filters	Identify whether the design and game are coherent and whether the target audience likes it enough to play it
The Toy	Identify whether the game would still be fun if the objectives were eliminated
Pleasure	Identify the elements that bring pleasure to players
Challenge	Identify the elements that bring challenge to players
Triangularity	Identify whether game elements offer options for the player to develop their way of playing
Punishment	Identify what the punishments are in the game and whether they are fair compared to the rewards
Modes	Identify whether the game needed difficulty modes with different levels of challenge
Playtesting	Identify what elements are necessary for testers to evaluate the game's pillars

A good interface contributes to the success of the game because, according to Schell [2019] and Rogers [2014], it brings the player closer to the game by presenting all the necessary visual elements to display basic systems such as: health bar, stamina, inventory, ammunition, maps, and other information. It is worth noting that developers must understand the interactions between the elements of the interface. According to [Schell, 2019, p. 268], "*The goal of an interface is to make the player feel in control of their experience*". At this stage, six Schell's lenses were used, which are presented in Table 9.

Table 9. Usage of Schell's lenses in defining the interface.

Lens	Reason of Usage
Control	Identify whether the interface brings a sense of control to the player
Physical Interface	Identify physical elements of interaction between player and game
Virtual Interface	Identify crucial information to understand the game world
Transparency	Identify whether the interface is intuitive and leaves the player free
Feedback	Identify what players want to know about the game
Juiciness	Identify the elements of satisfaction for the player

Finally, enemies are created, essential for a fun and captivating game as they represent the force that antagonizes the hero [Rogers, 2014]. Attention to detail is necessary for the enemies to function effectively. They must be consistent with the world, scenery, and elements they are placed in, and their form should coincide with their actions and attitudes. Rogers [2014] presents the necessary characteristics for creating interesting and memorable enemies such as: size, speed, attack method, and behavior. At this stage, the use of any Schell's lenses was not considered.

4 Game Development

This section provides information about the game development stage, including implementation details and the results, considering each of the ten stages of the Game Design process described in Section 3, applied to the conception of the game *Honor Keeper*[2].

4.1 Implementation

The game was developed using Unity with the High Definition Render Pipeline (HDRP), following the structure of Prototype, Alpha, Beta, and Launch with focus on performance with realistic graphics, exclusively for desktop platforms.

In the Prototype phase, everything related to the game's main mechanics should be developed as quickly as possible so that the design can be tested and necessary changes can be made without affecting future development stages. In the Alpha phase of the game, all mechanics and features envisioned for the game should be finalized, containing everything necessary for the game to function, although errors may still be present at this stage. In the Beta phase, ideally, all errors and issues found in previous stages should be resolved, and final polish should be added. Thus, at Launch, the game should be functioning smoothly and with the level of polish planned by the development team during the Game Design phases.

Honor Keeper: Between Blood & Sacrifice is an Action RPG (Soulslike) game, widely known for its complex and punitive mechanics, developed using professional-level 3D models, with support for console controllers. To play, certain minimum requirements are necessary: WINDOWS 7, 8, 8.1, 10, 11 (64-BIT); Processor Core i5 8600 or AMD Ryzen 5 3600X; 8 GB of Memory RAM; Video Card NVIDIA GeForce GTX 1060 6GB or Radeon RX 580 8GB; DirectX Version 12; and 5GB of space available at the storage disk.

[2] `https://www.youtube.com/watch?v=ROZuExNd7rk&t=0s` (Last access on 11 February 2024)

4.2 Brainstorming for game ideation

As shown in Table 1, this stage considered some pillars of the production process discussed by both Rogers [2014] and Schell [2019], along with eleven Schell's lenses. In defining the theme, the pillars have already proven highly effective in bringing better organization and performance to the process, while the use of selected lenses assisted the team in identifying the game's characteristics. The results of applying the lenses to the game *Honor Keeper* are shown in Table 10 .

Table 10. Application of Schell's lenses in the process of Brainstorming.

Lens	Results
Emotion	Power, Honor, Strength, Agility e Imposition
Essential Experience	Challenge
Fun	Combat, Equipment and Secrets
Resonance	Deflect attacks and submissions
Infinite Inspiration	Amicia de Rune (game *A Plague Tale: Innocence*), Kassandra (game *Assassin's Creed Odyssey*) and Selene (movie *Underworld*)
The Player	Players of the Souls Franchise (genre Soulslike)
Action	Sword (close range), Hand Ballista (long range) and Fury Skill (brutal combat)
Skill	Quick reflexes and understanding of controls
Moments	Combat (avatar clashes) and Exploration (player interacts and explores the scenarios)
Fantasy	Warrior and/or Guardian
Atmosphere	Darkness, Melancholy and Dark Soundtrack

In general, the brainstorming process yielded ideas reminiscent of a Soulslike game, aiming to provide a challenging experience that tests the player's skills with complex combat and mechanics. This has resulted in an asymmetric game where players find enjoyment in executing strikes and enhancing their combat prowess through exploration of equipment and secrets within the game map. The setting was envisioned with low lighting and a funereal atmosphere, featuring a village of terrified inhabitants locked inside their homes and furious characters outside. Figure 3 shows an image of the game illustrating these characteristics.

Figure 3. Image of the game *Honor Keeper* showcasing features of the adopted aesthetic and the main character of the game.

The inspirations for the game's protagonist evoke a resilient heroine, determined to overcome challenges in her journey and protect those she loves, driven by the desire to conquer lands, battle opponents, explore uncharted locations, and master the arts of combat, as well as to safeguard the innocent, defend institutions, and engage in honorable activities. Figure 4 displays images of the characters used as inspiration for creating the main character of the game *Honor Keeper* as shown in the Table 10 .

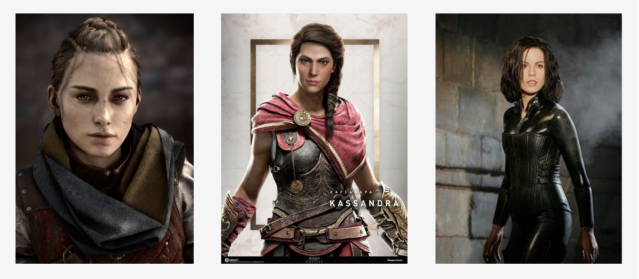

Figure 4. Heroines used as inspiration: Amicia from Rune of the game *A Plague Tale: Innocence* (left), Kassandra of the game *Assassin's Creed Odyssey* (center), and Selene of the movie *Underworld* (right).

4.3 Creation of the GDD

According to Table 1, three Schell's lenses were also used, the application results of which are presented in Table 11. In conjunction with these elements, the "**One-Sheet Document**" was created[3] as well as the "**Ten-Pager Document**", along with a "**Beat Chart**", shown in Table 12.

Table 11. Application of Schell's lenses within the GDD.

Lens	Results
Documentation	Optimized communication between team members
Venue	Definition of GDD focusing on characteristics of games in the Souls genre
Elemental Tetrad	Combination of mechanics, story, aesthetics and technology in defining GDD.

4.4 Game Story Creation

According to Table 1, the game's story creation used nine lenses. The results at the end of this process are shown in Table 13.

To make the game more engaging, since its focus is on gameplay, the structure of the Hero's Journey [Campbell, 1989; Calazans, 2020] has been adapted considering six of the twelve standard steps, as shown in Figure 5. The remaining stages of the Hero's Journey: *Refusal of the Call*, *Meeting the Mentor*, *Crossing the First Threshold*, *The Road Back*, *Resurrection*, and *Return with the Elixir* were not considered as it was identified that they would not add context to the game storyline.

The results for the game's story based on the adapted structure of the Hero's Journey with six steps are:

[3] `https://github.com/IkaroSiqueira/HonorKeeperFiles` (Last accessed on February 11, 2024)

Table 12. Beat Chart of game *Honor Keeper*.

Level:	Scenario 1-1
Name:	Silver Fortress
Game time:	Night
Story:	Selina Domnik goes to Silver Fortress to eliminate the enemies who conquered the area, freeing the people and the fort from the enemy's clutches
Progression:	Player learns controls, enters conflicts, collects equipment, unlocks gates and fights the boss
Play time:	20 minutes
Color scheme:	Gray (mist), Red (armor), Brown (coat), Green (vegetation) and Orange (lighting)
Enemies:	Lycans equipped with armor and the boss (white fur lycan)
Mechanics:	Attack, Dodge, Deflect attacks, Roll, Skill, Climb and Interact
Hazards:	Only the Lycans
Power-ups:	Belgren's Beer, Belgren's Book, Heroes' Fury and Armor
Abilities:	Heroes' Fury
Economy:	None
Bonus:	None
Music track:	The edge of nightmare and Fearless

Table 13. Application of Schell's lenses in the development of story.

Lens	Results
Surprise	Boss, responsible for the first invasion of the realm more than a century before the events of the game
Problem-solving	Explore different ways to deal with enemies and use strategies and movements compatible with the player's gameplay style
Unification	Interaction between mechanics, characters, controls and audio
Novelty	Use of different mechanics present in games of the genre combined into a single system
Obstacle	The main character has a relationship of overcoming and persevering with the obstacles she faces
Hero's Journey	Need to remove six steps from the Hero's Journey
Story	The story is necessary to give meaning to the game's mechanics and events
Help	People of Varkam, with their morals and beliefs
The World	Climate and geography compatible with the realm, its people, economy, culture and politics credible

- **Ordinary World:** the Varkam's realm is attacked by northerners seeking the destruction of local culture;
- **Call of Adventure:** Selina Domnik is called to reclaim the Fort and save the people of the neighboring village;
- **Tests, Allies and Enemies:** the area is filled with enemies equipped to confront the heroine, and within the village dwell innocent and defenseless peasants;
- **Approach to the Inmost Cave:** Selina, after defeating the enemies, enters the Fort to discover the source of all that terror;
- **The Ordeal:** the heroine must defeat a very ancient and powerful creature;
- **Reward:** she manages to eliminate the threats and reconquer the region for the realm.

An illustration of the game screen where this story begins to be presented to the player is shown in Figure 6.

Figure 5. Diagram of the adapted Hero's Journey, highlighting the utilized steps: Ordinary World, Call of Adventure, Tests, Allies and Enemies, Approach to the Inmost Cave, The Ordeal, and Reward [Machado, 2020].

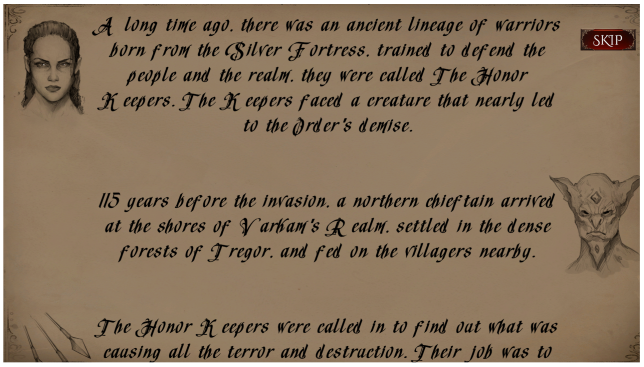

Figure 6. Image of the game showing the screen where the story is told.

4.5 Creation of Level Design

As Table 1 shows, in this stage, five Schell's lenses were utilized, with the results after the application of each one being displayed in Table 14.

Table 14. Result of applying Schell's lenses in the development of Level Design.

Lens	Results
Curiosity	Questions related to the people of the realm, the northmen, the invasion and its purpose
Flow	Clear and simple objectives, especially in the scenario
Time	It takes approximately twenty minutes for the player to go through the entire experience and feel complete
Inherent Interest	Combat agility, blows with exaggerated movements and the game theme
Indirect Control	Creating the scenario in an alley format brings indirect control in a simple and direct way

In conjunction with the selected lenses, the approach described by Rogers [2014] was also used in this stage, which presents some necessary items for a paper-based Level Design, including the initial location of the player and enemies, doors and gates, puzzle elements, treasures, chests, and collectibles, traps and their areas of effect, and important locations for the character. The resulting paper-based Level Design for the game *Honor Keeper* is presented in Figure 7.

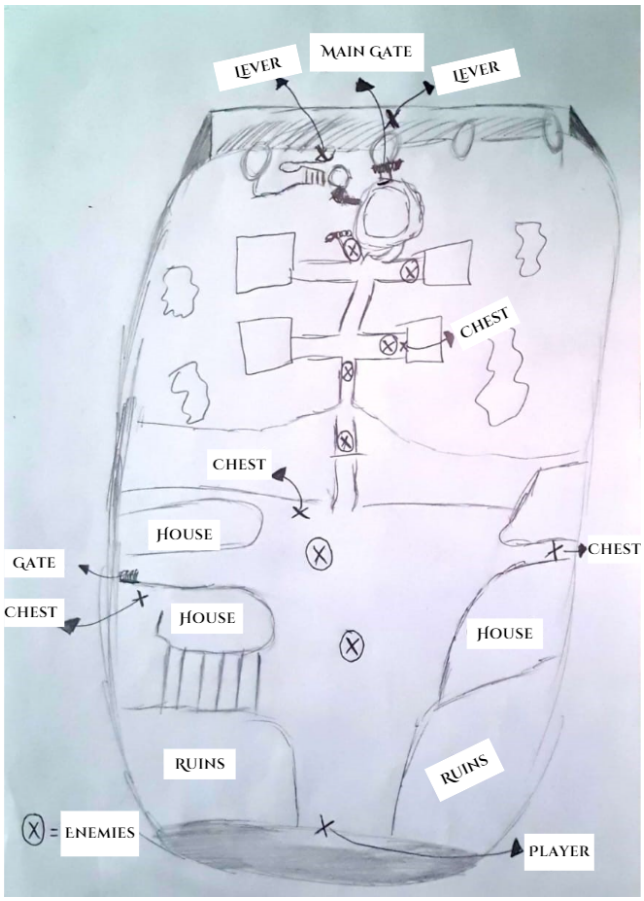

Figure 7. Sketch of the Alley-shaped Level Design defined for the game *Honor Keeper*.

The level designer chose to create a level in an alley format, with the main objective located at the end of its extension. The scenario was designed so that the player has a view of the objective from the beginning of the gameplay, giving them a sense of direction, as in Figure 8.

Some advantages of creating alley-shaped levels, according to Rogers [2014], include:

- Facilitating understanding of where to place interaction zones, as it is known where and how the player enters and exits the scenario;
- Increasing the possibility of dramatizing movements with the camera, aiming to inform the player of some hidden secret or to increase tension and drama in combat;
- Allowing the removal of camera control so that the player focuses entirely on gameplay;
- Allowing the creation of gameplay events scripted by action triggers because with this structure, the developer already knows the location of where the player is looking; and
- Facilitating combat dynamics and the use of traps, as there is only one place for the player to go.

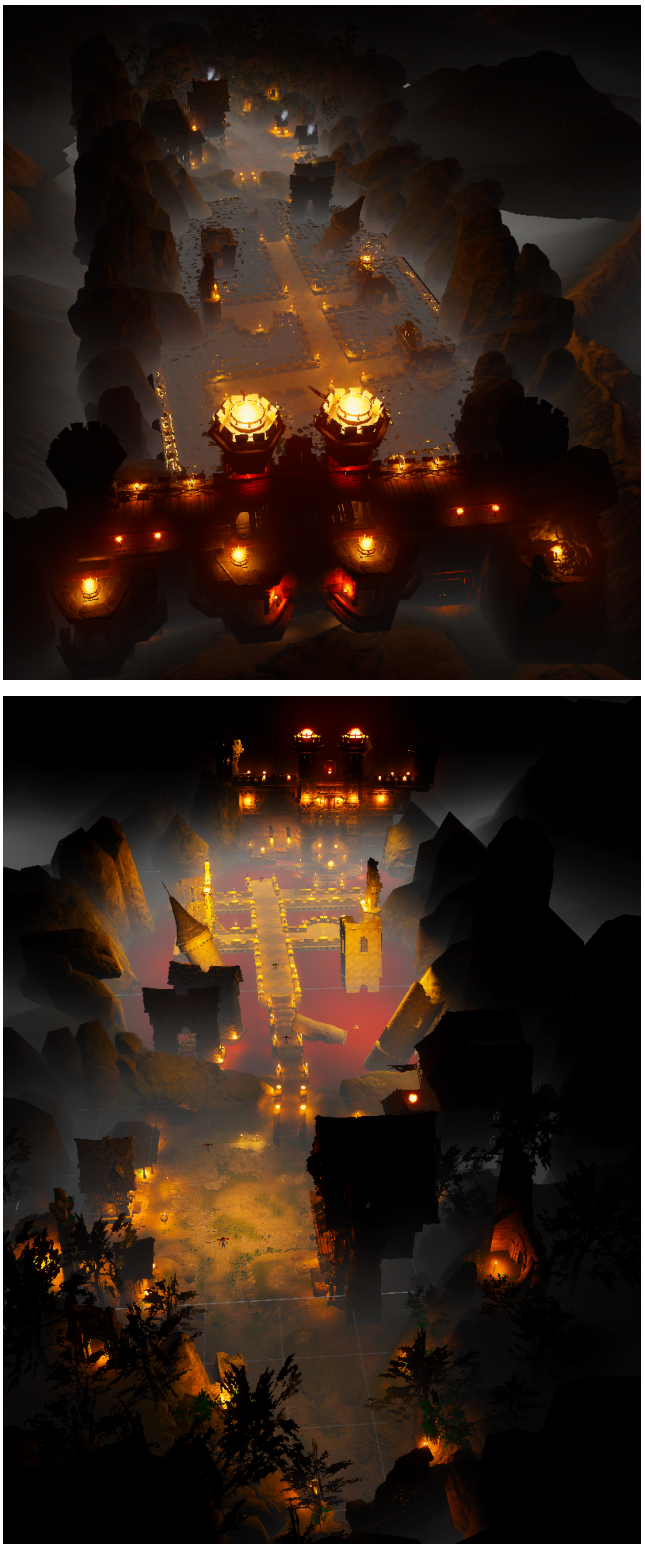

Figure 8. Two views of the finished scenario showing the Level Design created for the *Honor Keeper*.

4.6 Creation of the characters

The team's objective at this stage was to create a protagonist who would be a heroic character without falling into industry cliches. To achieve this, as shown in Table 1, two lenses were used: *The Avatar* and *Character Function*.

The usage of *The Avatar* lens resulted in behavioral characteristics of the main character with traits of agility and grandeur, while the *Character Function* lens resulted in identifying the function of the character within the game according to their type:

- **Main character:** a determined warrior intent on saving the village and reclaiming the Fort;
- **Common enemies:** antagonists of the main character, linked to combat;
- **Boss:** final enemy, presenting the greatest danger and difficulty;
- **Citizens:** responsible for providing information about the world through dialogues.

4.7 Camera development

In this stage, a third-person camera was conceptualized where the player has the option to configure its distance. This allows the player to explore the world more freely and have greater peripheral vision, which is crucial given the frenetic and complex nature of combat in Soulslike genre games.

Additionally, the over-the-shoulder camera feature was also included to reaffirm the pillars developed in the game. As shown in Table 1, a lens called *Risk Mitigation* was also used to address camera-related issues.

4.8 Control development

The ergonomic hand map of a player presented at "Gamers' Guide to Flex-O-Fingering" by Rogers [2014], depicted in Figure 9, was used to assist the team in mapping the game buttons, both for console controls and keyboard and mouse, as shown in Figure 10.

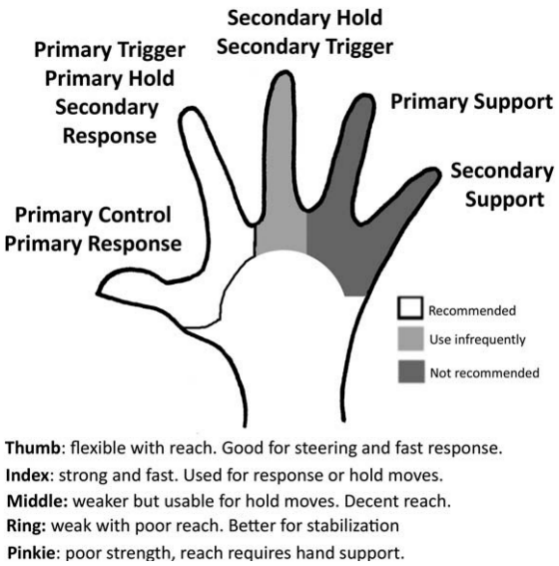

Figure 9. Ergonomic hand map of a player [Rogers, 2014].

In conjunction with this approach, as shown in Table 1, two lenses were also utilized for the structuring of controls: *Imagination* and *Skill vs. Chance*. Through the application of the first lens, the necessity of complete control comprehension was realized to ensure the experience of the player is not frustrating or negative. The application of the second lens resulted in the implementation of complex mechanics to reinforce the core characteristics of Soulslike games, which demand greater player skill for increased chances in the game.

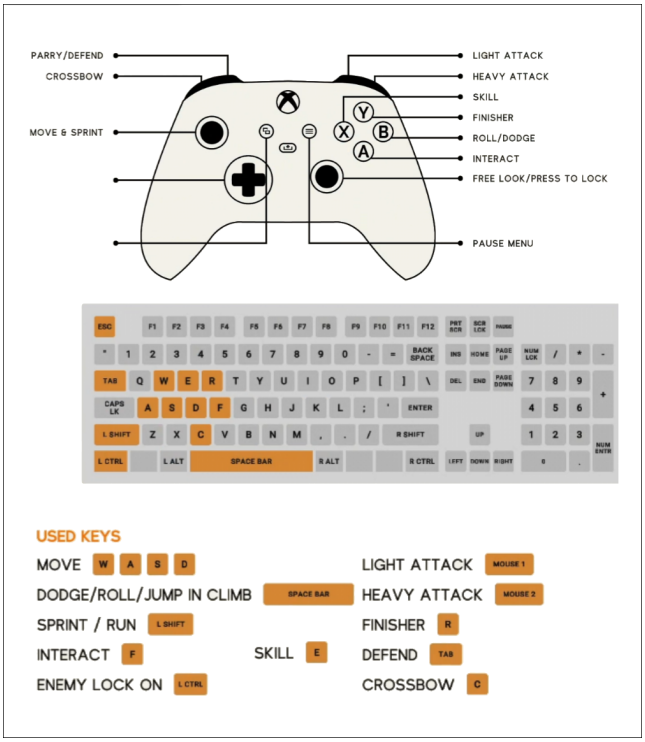

Figure 10. Commands mapping of console control (above), keyboard and mouse (below).

4.9 Combat development

The team considered the use of traditional combat mechanics, as outlined by Rogers [2014] and widely utilized in the industry, to create a complex and satisfying combat system. These mechanics include strong and light attacks, blocking and offensive strategies, as well as finishing moves, which rely on the player executing a special attack to defeat an opponent. Additionally, as depicted in Table 1, seven lenses were also taken into account, the outcomes of which are presented in Table 15.

Table 15. Application of Schell's lenses in the combat.

Lens	Results
The Eight Filters	Use of Game Design methodologies refer to a coherent game with new features and technical performance
The Toy	Without the objective of eliminating enemies and conquering lands, the game would lose its fun
Pleasure	The most enjoyable element is the combat, with its complex mechanics.
Challenge	The challenge is directly linked to enemies' blows and their aggressive behavior
Triangularity	Use of Game Design methodologies return to a satisfactory condition
Punishment	The game has punishment compatible with games of the genre, where frustration is not the main element
Modes	Use of Game Design methodologies refer to a game with satisfactory levels
Playtesting	Camera, movement, finisher, Level Design and interface

4.10 Interface development

As shown in Table 1, for the game interface design, encompassing all visual aspects, six lenses were applied, the outcomes of which are presented in Table 16. The interactive elements within the game were evaluated in this paper through tests conducted as described in Section 5.

Table 16. Application of Schell's lenses in interface development.

Lens	Results
Control	The use of Game Design methodologies leads to an effective interface
Physical Interface	Control, button layout and game broadcast screen
Virtual Interface	Information related to the story and combat and their mechanics
Transparency	The use of Game Design methodologies leads to an intuitive interface
Feedback	Information related to the story and combat and their mechanics
Juiciness	Combat elements and their mechanics

4.11 Enemy development

In this stage, no lens was used, but some characteristics defined by Rogers [2014] were considered. Enemies can come in various sizes, from small to giant, but only medium and huge sizes were chosen. Enemies can also exhibit a wide range of behaviors, among which the team selected the **Pursuer**: enemies that relentlessly chase the player if they enter their field of vision. Additionally, depending on their role, an enemy may have different speeds and attack methods. Regarding speed, the team opted for medium speed, similar to that of the main character, and fast speed, characterized by agile movement allowing for multiple attacks and sudden lunges towards the character, leaving little time for reaction. As for the attack method, the team chose melee attacks, commonly found in bestial enemies with strength and vitality. These characteristics can be observed in Figure 11, which depicts a scene from the game where the main character engages in combat with the final enemy, the game boss.

Figure 11. Game image showing the main character in combat with the final enemy, the game boss.

5 Playtesting and Results Evaluation

This section presents the game validation approach and the information collected through the questionnaire developed to evaluate the player's experience during testing. The analysis of all results presented is discussed in Section 6.

5.1 Validation approach

To assess the developed game, a questionnaire consisting of 11 questions was devised, aiming to gauge players' perception in the key areas.

The structure and concepts advocated by Schell [2019] in his methodology were used to develop the questionnaire, which was made available through Google Forms. The game was accessible through the *itch.io platform*[4].

The first eight questions employed the Likert scale. According to Aguiar *et al*. [2011], the use of this scale is potent in gathering opinions from players who have tested the game, acquiring their impressions and overall views on the tested product. In addition to its efficiency in data collection, it assures players, making them feel confident that their choice truly represents their opinion. Therefore, it was decided that these questions would offer response options ranging from levels of satisfaction: 1 (*very dissatisfied*); 2 (*dissatisfied*); 3 (*neutral*); 4 (*satisfied*); and 5 (*very satisfied*). The remaining questions allow the respondent to choose the options that best represent their opinion. Each question aims to assess user satisfaction with an aspect of the game related to multiple stages of the Game Design methodology, as shown in Table 17.

Table 17. Relationship between the questions in the questionnaire and the stage of the methodology evaluated.

Question	Stage
How often do you play digitally? (often, occasionally, rarely or not at all).	Brainstorming
Regarding Dubbing, Sound Effects and Music, what is your level of satisfaction?	Brainstorming and Story
About the Level Design (Scenario), what is your level of satisfaction?	Level Design
Regarding the character animations, what is your level of satisfaction?	Character and Enemies
Regarding camera control and movement, what is your level of satisfaction?	Camera and Control
About the finishing mechanics, what is your level of satisfaction?	Brainstorming, GDD and Combat
Regarding the combat and skill system, how satisfied are you?	Combat
Regarding the UI (User Interface), what is your level of satisfaction?	Interface
If you could summarize this test version in one level of satisfaction, what would it be?	All
Select the feelings that best describe your experience. (satisfaction, good feelings, bad feelings or frustration).	All
What were your biggest difficulties? (movement, camera, combat, life and posture systems, user interface, difficulty level or optimization).	All

[4] `https://ikarosiqueira.itch.io/honorkeeper` (Last access on 11 February 2024)

5.2 Results

The tests were conducted over a week. In total, 46 players tested the game and responded to the questionnaire, of which 28 provided comments on possible improvements for the game. Although the developed game draws strong inspiration from the Souls franchise and similar genre games, it is not the developers' intention to create a frustrating experience for players to overcome their difficulties. Therefore, in the analysis of the results, frustration was considered an undesirable characteristic present in some elements of the game.

Participant selection was done conveniently, based on the student contact network. The game and evaluation instructions were made available online, and each person could participate according to their willingness, resources, and availability. Participation was voluntary, no personal data was collected, and participants responded to the opinion questionnaire authorizing the use of data for research. The game evaluation was conducted solely for the student education, facilitating their reflection on the game built based on feedback from its audience. According to Resolution 510 of April 7, 2016, from the Brazilian Health Council, evaluation by an ethics committee is not executed for research aiming at theoretical deepening of situations that emerge spontaneously and contingently in professional practice, provided they do not reveal data that may identify the subject.

To understand the profile of the players who participated in the tests, a first question related to the frequency with which users usually consume digital games was elaborated. Based on the results, it was observed that the vast majority usually play *frequently* (65.2%), while those who responded *occasionally* represent 19.6%, and finally, those who play *rarely* are part of the 15.2% of total respondents. Therefore, most participants are familiar with digital games and play them regularly. Thus, the analysis of the results of this research can point out relevant issues regarding the development of the game and the adopted Game Design methodology.

The results of the eight questions that analyzed the player satisfaction level with the main aspects of the game *Honor Keeper* are presented in Table 18.

Table 18. Level of user satisfaction regarding the main aspects of the game that were evaluated using the Likert scale.

Game Aspect	Level of Satisfaction				
	1	2	3	4	5
Dubbing, sound effects and music	0.0%	6.5%	17.4%	32.6%	**43.5%**
Camera and movement control	13.0%	21.7%	**28.3%**	19.6%	17.4%
Character animation	2.2%	2.2%	**32.6%**	30.4%	**32.6%**
Combat and skill	0.0%	2.2%	21.7%	28.3%	**47.8%**
Finisher mechanics	4.3%	2.2%	15.2%	23.9%	**54.3%**
Level Design	0.0%	2.2%	8.7%	32.6%	**56.5%**
User Interface	2.2%	2.2%	10.9%	17.4%	**67.4%**
General aspects	0.0%	2.2%	13.0%	**43.5%**	41.3%

The questionnaire also involved two questions about players' feelings when playing and their difficulties, whose results can be seen in Figures 12 and 13. The first question aimed

to understand the feelings that best described the user experience with the game from *frustration* to *satisfaction*, also considering only *good feelings* and *bad feelings*. The other question aimed to understand what the biggest challenges would have been regarding topics such as *camera*, *movement*, *combat*, *optimization*, *life and posture* systems, *difficulty level*, and *user interface*.

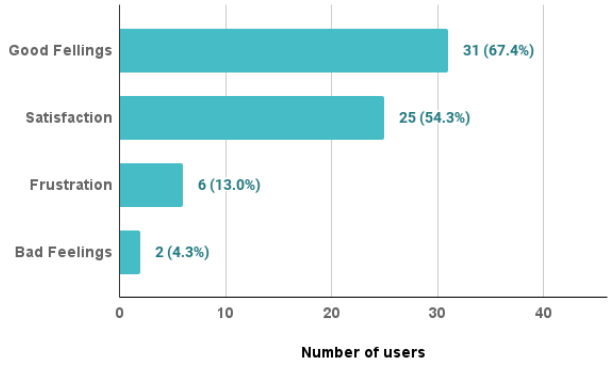

Figure 12. Feelings that best describe the user experience.

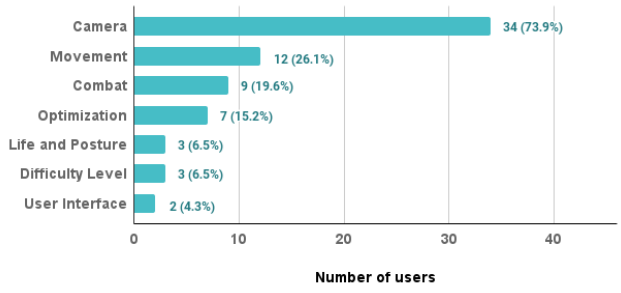

Figure 13. The main challenges encountered in the game by the users.

6 Results Analysis

Considering voice acting, sound effects, and music in the game, the majority of users, representing 43.5% of respondents, declared themselves *very satisfied*, followed by 32.6% who were *satisfied*, 17.4% *neutral*, 6.5% *dissatisfied*, and, finally, no respondents declared themselves *very dissatisfied*. These responses indicate little need for improvement in elements related to this topic. However, some comments pointed out the need for voice acting for the main character, higher-quality audio, and the removal of dialogue boxes, suggesting that very dissatisfied respondents may have felt the lack of these elements more than others. This highlights the main areas for improvement in this part of the game. Regarding dialogue boxes, it is important to note that they were used to compensate for the lack of voice acting for the characters; therefore, ideally, the team would not need to use them. However, according to the opinions, they could be restructured to function more naturally.

Opinions regarding the camera and movement were divided, with satisfaction levels not centralized. 28.3% of respondents declared themselves *neutral*, 21.7% *dissatisfied*, 19.6% *satisfied*, 17.4% *very satisfied*, and finally, 13.0% *very dissatisfied*. This result indicates that the characteristics relating to the camera and movement were not very pleasing to the respondents, possibly due to a misunderstanding among players about the lock-on mechanic, present to center the camera on the enemy. However, some comments pointed out the need to be able to adjust the camera sensitivity, support alternative controls, invert control schemes, and control blur levels, elements crucial for customizing the game according to the player's preferences, preserving their experience. Additionally, there were requests to be able to adjust button functionalities and control camera distance, which were already implemented, possibly due to a misunderstanding of the game's functionalities. The absence of these mentioned elements may have directly affected the experience of those who declared themselves very dissatisfied and dissatisfied, indicating that these elements need to be reworked to achieve higher levels of player satisfaction.

For character animations, 32.6% of respondents declared themselves *neutral*. The same percentage, 32.6%, declared themselves *very satisfied*, 30.4% *satisfied*, 2.2% *dissatisfied*, and 2.2% *very dissatisfied*. However, some comments pointed out the need for smoother animations and collision detection, highlighting the main areas for improvement in this part of the game.

As for the combat and skill system, the majority of users, representing 47.8% of respondents, declared themselves *very satisfied*, followed by 28.3% *satisfied*, 21.7% *neutral*, 2.2% *dissatisfied*, and finally, no respondents declared themselves *very dissatisfied*. These responses indicate little need for improvement in elements related to combat and the skill system. However, some comments pointed out the need for greater difficulty, visible arrow trajectories, greater diversity in enemy behavior, and the ability to lock onto enemies. These elements are crucial for a more engaging combat experience, indicating that they need to be reworked to achieve higher levels of player satisfaction.

Regarding finishing mechanics, the majority of users, representing 54.3% of respondents, declared themselves *very satisfied*, followed by 23.9% who were *satisfied*, 15.2% *neutral*, 4.3% *very dissatisfied*, and 2.2% *dissatisfied*. These responses indicate little need for improvement.

The majority of users, representing 56.5% of respondents, declared themselves *very satisfied* with the game's Level Design, followed by 32.6% who were *satisfied*, 8.7% *neutral*, 2.2% *dissatisfied*, and finally, no one declared themselves *very dissatisfied*. These responses indicate little need for improvement in elements related to Level Design. However, some comments pointed out the need for optimization, introductory levels for mechanics, and the removal of invisible walls, elements crucial for improving the user experience, indicating that these elements need to be reworked to achieve higher levels of player satisfaction. Such optimizations were note considered in this implementation due to their complexity specially considering the small team size.

Industry veterans, such as Aversa and Dickinson [2019], assert that to achieve good performance results in any game, the team must develop it with optimization in mind in all aspects, which was not the case here, as the team only addressed this issue at the end of the development process. Regarding the introductory levels for mechanics, it is important to note that the team was developing a scenario to fulfill this

function, similar to what was created by Projekt and RED [2020], where the game teaches the player all commands and mechanics for the best possible understanding and experience. However, they had to remove it to meet the game's release deadline. With reference to the removal of invisible walls, it is important to note that it is a quick and low-cost performance resource, so the team chose to use them. In an ideal scenario with time and resources, this type of element would not be used in game development

Regarding the user interface, the majority of users, representing 67.4% of respondents, declared themselves *very satisfied*, followed by 17.4% who were *satisfied*, 10.9% *neutral*, 2.2% *dissatisfied*, and finally, 2.2% *very dissatisfied*. These responses indicate little need for improvement in elements related to the user interface.

About the overall aspects of the game, the majority of respondents, 43.5%, declared themselves *satisfied*, 41.3% *very satisfied*, 13.0% *neutral*, 2.2% *dissatisfied*, and no one *very dissatisfied*. The responses demonstrate that even with some problems and possible improvements, the game achieved a very significant level of acceptance among respondents.

With reference to feelings, of the 46 test participants, 31 (67.4%) reported experiencing *good feelings* during the game test, 25 (54.3%) *satisfaction*, 6 (13.0%) *frustration*, and 2 (4.3%) *bad feelings*. These responses reflect the satisfaction levels present in the previous questions, showing that a large portion of users had good experiences, but some encountered problematic elements during gameplay.

About possible difficulties with the game, 34 (73.9%) participants reported difficulty with the *camera*, 12 (26.1%) with *movement*, 9 (19.6%) with *combat*, 7 (15.2%) with *optimization*, 3 (6.5%) with the *life and posture system*, 3 (6.5%) with *difficulty level*, and finally, 2 (4.3%) with the *user interface*. These responses reflect the dissatisfaction levels present in the previous questions, showing that the biggest problem in the analyzed game is the camera, one of the pillars for movement and combat. This result highlights the main problem of the game, one of the elements that need to be reworked by the team, as it directly affects core mechanics within the game.

6.1 Final remarks

It was evident that by utilizing the methodologies of Schell [2019] and Rogers [2014] in the game development process, the team was able to deliver a product that pleased players overall, despite significant issues related to the camera and various other areas for improvement, as pointed out in the previous section.

One of the key highlights of using these methodologies is the ease of identifying errors and potential solutions to address them, which is only possible due to the high level of organization and structuring they provide. This, combined with the feedback and comments from respondents, gives developers all the necessary tools to update the game, making it increasingly engaging and comprehensive for players.

However, the same cannot be said if developers do not employ these methodologies. Without them to help the team structure and organize the game, it would be difficult to identify errors made during its development, resulting in a project with potential structural issues. In such a scenario, even with player feedback, developers would still need to restructure the game to find the best way to make changes, aiming to meet players' demands and needs.

7 Conclusion

The conception of a game goes beyond understanding the basic elements and player categories. Creating a game, thinking in the most complete, structured, and coherent way possible, is a challenging activity that demands a good Game Design methodology - especially when we are talking about design professionals in the process of formation. Understanding design methodologies, activities that support their application, and experiencing the instantiation of these methodologies and activities in practical work is necessary to support the formation of professionals working in this area.

This paper is an extension of the study presented by Vitor *et al*. [2023], where two methodologies were combined to create a version suitable for the needs and understanding of the game. The derived methodology consists of ten stages, which were developed using elements and frameworks from Rogers [2014] and lenses of Schell [2019]. By applying the combined version of the methodology, the designer was able to experiment with Game Design practices and, through discussions and revisions with supervisors and collaborators, arrived at the creation of the game *Honor Keeper: Between Blood & Sacrifice*, an Action RPG (Soulslike) game in which a realm invaded by furious creatures must be liberated by a heroine.

In this paper, details of the implementation and results obtained during the development of the designed game are also presented. The developed game was evaluated by making it available for real user testing, who later responded to a questionnaire about the main aspects of the game. The analysis of the results showed that the use of the Game Design methodology enabled the development of a complete game that pleased the players overall, although it needed improvements, mainly regarding the camera.

The experience with the study of two methodologies and their combination for the student project proved to be powerful for them to start their development as a Game Designer by connecting activities and practices, following them from the beginning to the conception of the game.

The methodology discussed in this paper is being used in another research that involves the design of an educational game. Other research can be conducted with the aim of validating the methodology, applying it to the design of games of other types or different genres. With this it will be possible to observe whether there is a need for adjustments in the Game Design methodology. In future work, adjustments to the Game Design methodology such as the inclusion of new stages or changes to the elements used in each stage can be studied. It has already been observed, for example, that the inclusion of specific steps related to the audio-visual part of the game must be beneficial to the project, however for this other factors and professionals can be considered for game development such as artists and audio designers.

Declarations

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Authors' Contributions

The contributors of this paper are: Ikaro Siqueira Rodrigues Vitor (conception, methodology and software development, validation, writing – original draft, review & editing), Elisa de Cássia Silva Rodrigues (supervision, writing – original draft, review & editing) and Bruno Guazzelli Batista (writing – review & editing). All authors read, reviewed and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

Availability of data and materials

As supplementary material to this article we provide the "**One-Sheet Document**" and "**Ten-Pager Document**" that are part of the Game Design Document (GDD).

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