FACULTY OF SCIENCE, ENGINEERING AND COMPUTING

School of Computer Science and Mathematics
'MA' DEGREE
in
Game Development (Design)

CI7800 Digital Media Final Project
FINAL REPORT

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Project Title: Player, Avatar, and Character – A Closer Look at the Relationships and the Impact on Player Experience in RPGs

Date: 8th January 2022

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Project Type: BODY of CREATIVE WORK

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Abstract

This project aims to develop a new model to perceive the player-avatar-character relationship in single-player role-playing games. After reviewing relevant game literature and conducting a small-scale research study, the results showed that the proposed measurement criteria can be used to measure different psychological processes and game design elements responsible for developing such relationships. Avatar and playable character are presented and explored as separate entities. The structure and validity of the proposed model were supported by relevant research studies cited throughout the document. The outcomes demonstrated that many different factors influence the creation of the player-avatar relationship, which expand further upon self-identification and self-differentiation theories. The effectiveness and the scale of the proposed model were discussed concerning the game development implications.

Keywords: role-playing video game, player-avatar relationship, player-character relationship, measurement

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Aims and Objectives

The aims of this project were the following:

1. To evaluate the current state of the art regarding avatars in video games and to create a new perspective on how both game developers and researchers can view avatars and, later on, approach their construction in game design.
2. To write a brand-new narrative that promotes character attachment and can be implemented in the prototype.
3. To design and prototype a short role-playing game in Unity 3D.
4. To conduct player research to test the player relationship with the avatar and how that relationship influences the overall gaming experience.

The purpose of the first aim is to redefine the current terminology of avatars in video games with an emphasis on the role-playing genre to be able to understand how they convey meaning to players and stories in their game worlds, and how players communicate, interact, and perceive them in virtual environments.

The last three aims of this project are intertwined together, and their outcome is to develop a short role-playing game through which qualitative and quantitative data can be collected. The main purposes of these aims are (1) to look at how players experience the narrative through their avatar, (2) to measure if or how the character's personality can influence players' behaviour and/or choices, and (3) to see which avatar-related game design elements greatly contribute to creating an enjoyable and immersive player experience.

The objectives of this project are the following:

1. To look at already conducted research, literature, and methodology to define a structure of the most important topics* regarding avatars in video games.
2. To write a multi-dimensional character in a rich new world with interesting plots and dialogues (the screenplay is needed for the story implementation in the prototype).
3. To use common interaction, world building, environmental storytelling, simple choice-making, and consequence design techniques seen in many small and big role-playing video games to allow players to experience a new story through the eyes of its protagonist.
4. To construct an appropriate questionnaire and game systems that would gather both qualitative and quantitative data revolving around choice-making and general player experience to determine how players perceive their avatars and create their player-avatar relationships.

*Such topics are occurring psychological processes when players use avatars, players' perception of avatars as more than just displayed body they can control, types of players' relationships with their avatars, the role of game genres in creating a purpose for avatars (highlight on role-playing games), the role of enjoyment and immersion as a concept for using avatars in games, desirable traits of avatars in terms of game design, and human preferences and importance of individual views of player avatars.

Introduction and Literature Review

Video games today, as a medium, offer highly immersive, entertaining, and memorable experiences, allowing players to enter virtual worlds and interact with them however their hearts desire – naturally, within the construct limits of the games themselves. Especially in single-player, role-playing games which are now fully equipped with enormous map sizes, superbly realistic graphics, enjoyable mechanics, and multi-layered narratives, players experience their in-game presence through something researchers and developers call an avatar. Just as many other terms in game literature, avatar as a concept is still widely discussed and analysed.

The general definitions of the word avatar in terms of video games are somewhat similar as they fall close in line with "The avatar is the embodiment manifestation of the player's engagement with the gameworld; it is the player incarnated" (Gazzard, 2009), or "Avatars are interactive, graphical, and social representations of users in digital spaces" (Meadows, 2008, as cited in Banks & Bowman, 2014). One thing is for sure – through avatars, the game registers the player's input. Therefore, avatars represent the player's virtual presence (will, behaviour, choices, etc.) in the game world.

The aspect of avatars that is not that well generalized nor agreed upon is their relationship with the player. The two most commonly discussed approaches towards defining player-avatar relationship in video games are (1) merged identity, "(…) when a player is absorbed (…) with heightened feelings and adopts certain aspects of the in-game identity both emotionally and cognitively" (Li, Liau & Khoo, 2013), and (2) social dyad, when players and avatars co-exist at the same time, which is measured as a form of emotional intimacy and perceived agency (Banks & Bowman, 2013). There are even cases that elaborate how player-avatar relationships should be viewed from both perspectives at the same time (Banks & Bowman, 2014).

Although both these approaches validly detail how close humans feel towards their in-game representations, there are a lot of other factors that could be discussed when defining the player-avatar relationship. For example, from a psychological point of view, the word identification which as well as the player-avatar relationship has many different interpretations, may not be the only psychological process occurring when the player interacts with its avatar (Papale, 2014). Another factor could be the importance of how the avatar is displayed on the screen, without defining it as just a "displayed presentation" of the player, but a separate "presence" with special characteristics, which could lead to projective play (Gazzard, 2009). This factor could connect to another regarding avatars with different kind of personalities (one-dimensional or multi-dimensional) and their impact on player involvement, enjoyment, and immersion (Tychsen, McIlwain, Brolund & Hitchens, 2007).

Additionally, it is of grave importance to look at avatars through the lenses of their own genres of games – players, as individuals, may have different interpretations of their role and perception of control they have over their avatars in different game genres (Jørgensen, 2009). For example, avatars and controls over them are quite different in turn-based tactics games such as *XCOM 2* (Firaxis Games, 2016) when compared to role-playing games such as *The Witcher 3: Wild Hunt* (CD Projekt Red, 2015) or simulations such as *The Sims 4* (Maxis, 2014). The mentioned definition of the video game avatar can be applied to all of these games, but the player-avatar relationship, player's perception, avatar's attributes, personalities, and controls are all different. That is why this project mainly focused on the single-player role-playing genre of video games and tried to offer a new perspective on the mentioned avatar-related topics.

In role-playing games, the most story-driven and possibly immersive genre of all, the players, in most cases, play as the protagonist of the story. Therefore, the player's avatar is the sole focus of the entire playthrough, making the player-avatar relationship very distinctive and important to the game design, as it serves as a vessel for an alluring and comprehensive player experience. Since they are so important for bringing the game's narrative to life, the avatars in role-playing genres inspired this project to look at another factor related to game avatars, which has not been thoroughly discussed – their character. The player-avatar relationship is not entirely based on only the player's perception of the avatar's functions, appearance, behaviour, etc. – it is also based on a *playable character*. Although playable character and avatar are usually used to describe the same concept, this project believes that character and avatar are two separate identities that lead towards the same goal: player's immersion. If we say that the avatar is the player's in-game embodiment that the player gets attached to (either through self-identification or by creating a social dyad), a character is then a story element that gives the avatar its dimensions, without entirely becoming one with the avatar. Both can exist separately; one determines the mind and the other the body, but together they create deeper meaning and understanding of the game itself.

For example, if we look at the Tomb Raider series (Crystal Dynamics & Eidos-Montréal, 2013-2018), players play as Lara Croft, an English archaeologist who explores myths and legends in various ancient locations around the world, while at the same time, hoping to find out the truth about her father's research and his death. In all three titles, the players have similar looking avatars with gradually evolving graphics, mechanics, and other game systems. What would happen if players would play the same game, with the same mechanics and avatars in the same world, but with a different character? Naturally, the structure of the story, its events and developments would change, but what of avatars? Would they still feel the same? Would players care about them as they care for Lara Croft? It is only natural to have preferences and like some characters while disliking others in all mediums, not just in games. Therefore, the way we combine avatars and characters (player's embodiment and game's narrative) is a vital element of the player-avatar relationship, which may be the decisive instrument in creating a positive and immersive player experience. Perhaps, if we look at the player-avatar-character relationship instead of only player-avatar, we could determine more accurately what design concepts create such a desirable experience.

Methodology

The development process for this project was split into four phases:

1. Reviewing literature and developing the hypothesis
2. Designing and then making the prototype (in Unity 3D)
3. Conducting participants' data through playtesting and post-game questionnaire
4. Analysing data and finalizing the report and other deliverables

When the literature review, story (and character) creation process, and resource gathering was well established, the next step was moving the design plans into motion by implementing them into the chosen game engine. As the implementation of the design was very important, but also challenging process, some design decisions varied from the initial idea during the production phase, but the essence and purpose of the prototype remained the same. At the same time, the screenplay was generated and incorporated into the prototype. Once the prototype and screenplay were merged, and the prototype was ready to be tested, a set of questionnaires was produced to gather qualitative and quantitative data related to the created prototype, collecting players' feedback on discussed topics. Afterwards, as all necessary deliverables were completed to gather targeted data, the author looked for participants to test the prototype and share their experiences during their playthroughs. Lastly, as all the data was gathered, the final report was written down, explaining the entire research process, from the initial idea and design's purpose to the results of gathered data and their interpretation which would underline the importance of this research's thesis concerning the concepts and implementations of avatar attachment in game development.

Development Process	Timeline										
	March	April	May	June	July	August	September	October	November	December	January
Literature Review	▓	▓	▓								
Story Creation	▓	▓	▓								
Resources Gathering	▓	▓	▓								
Making the Prototype			▓	▓	▓	▓	▓				
Writing the Screenplay			▓	▓	▓	▓					
Making the Questionnaire								▓			
Looking for Participants & Testing								▓	▓		
Analysis of the Data									▓	▓	
Finalizing the Report									▓	▓	
Submission Date											▓

Table 1: Production Plan

Phase One: Developed Hypothesis

After reviewing multiple research studies related to the player-avatar relationships and touching the subjects such as the merging identification and separate identities (Banks & Bowman, 2014), self-identification measurement on a *Player-Avatar Identification* scale (Li, Liau, & Khoo, 2012), self-identification through character role, competence, and desired personalities (Hefner, Klimmt & Vorderer, 2007), and player-avatar archetypes (Banks & Bowman, 2013), a simplified model of the two most commonly developed approaches towards player-avatar relationship was made.
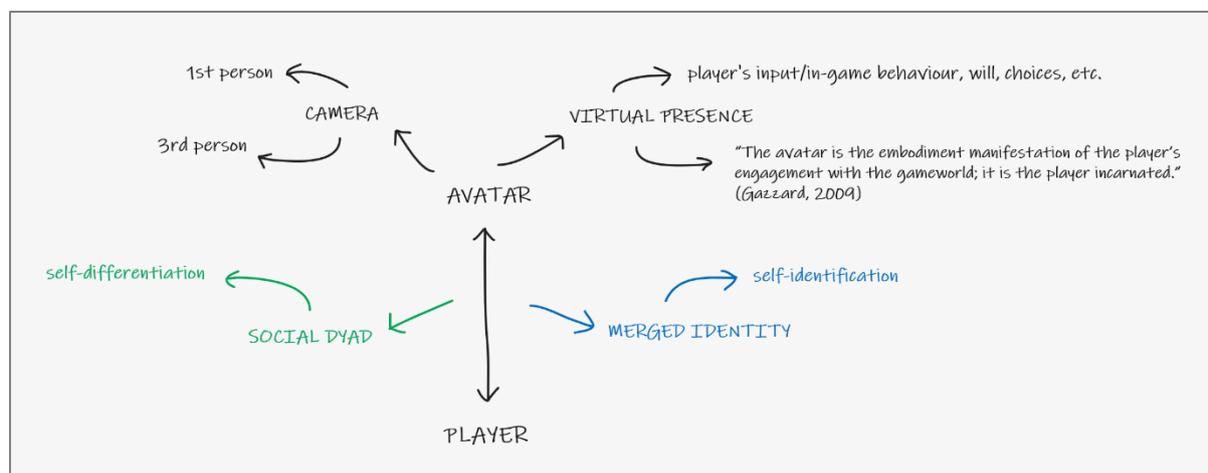

Figure 1: A simplified player-avatar model based on the literature review

According to these sources, the player-avatar relationship is mostly viewed either as a state when the player partly or fully self-identifies with the in-game avatar on both emotional and cognitive scale or as a state when the player self-differentiates with the in-game avatar, creating a dyadic social connection rather than a singular unifying one. It is important to note that, for this research, these approaches were simplified to express only the key points and maintain the targeted scope. It is strongly recommended to study all factors which are used to define individual theories to be able to fully comprehend how individual concepts were constructed.

To delve deeper into how humans perceive in-game avatars from a psychological point of view, it was necessary to review research papers about emotional and cognitive factors which contribute to creating their relationships and explore topics such as avatar's presence and display (Gazzard, 2009), psychological processes occurring during play (Papale, 2014), dimensions of player involvement (Herrewijn, Poels & Calleja, 2013), complex character personalities in multiplayer role-playing games (Tychsen, McIlwain, Brolund & Hitchens, 2007), avatar perception in multiple genres (Jørgensen, 2009), and interpersonal attraction for avatars in video games (Coulson, Barnett, Ferguson & Gould, 2012). After applying this broader and comprehensive discussion of how players interact with their in-game avatars to the previously defined player-avatar model, a new model was developed to express the findings of this research.
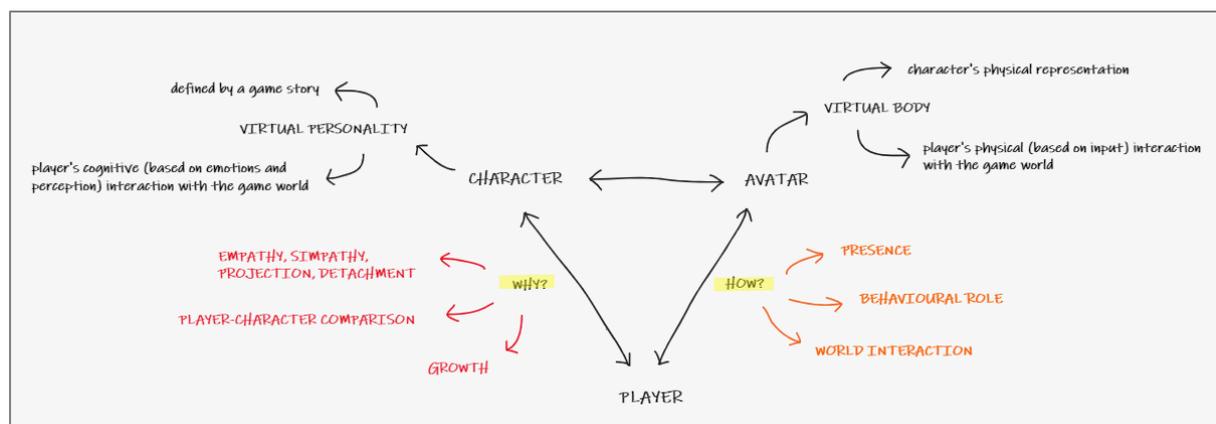
Figure 2: A new model defining the player-avatar-character relationship

After defining avatars and reviewing their relationships with players from game literature and psychological perspective, it became evident that different game design elements contribute to creating the overall perception of them. Therefore, if an avatar is the player's in-game embodiment then it influences *how* the player is interacting with the game world. But to give a reason *why* the player is interacting with the game world in the first place, that meaning has to come from a playable character. Even though character as a concept is inherently embedded into the avatar, especially in digital role-playing games, it has an entirely different function, even its own personality, intentions, and motivations (Jørgensen, 2009). That is why instead of focusing on only the player-avatar relationship, this research study proposes to look at the player-avatar-character relationship to be able to identify more factors that influence the creation of lovable avatars and have a broader knowledge of their impact on player experience.

The proposed criteria for defining in-game player-character relationship is the following:

1. Players experience more than one psychological process during play; at least four more (other than self-identification or self-differentiation) are empathy, sympathy, projection, and detachment (Papale, 2014).
2. The comparison between the players and in-game characters is inevitable; the players need to have a generally exemplary and compelling role, play as someone who has a desirable personality, and have the right skills and tools to complete their tasks and feel good when they compare their real selves with the virtual character (Hefner, Klimmt & Vorderer, 2007).
3. Character's emotional growth and change must be perceived by the players to make the narrative interesting which can lead to immersion; captivating players with the engaging narrative can create stronger bonds between the player and the game, creating a stronger desire for replayability (Herrewijn, Poels & Calleja, 2013).

The proposed criteria for defining in-game player-avatar relationship is the following:

1. Players need to feel virtually transferred into the game world; players invest into their avatars, they are attached to them, which differentiates avatars from "representative elements displayed (…) onscreen" and creates a sense of presence (Gazzard, 2009).
2. To act within the game world, players need to have a sense of agency; in games, avatars provide a role (different from the role of a character) with a social function and behaviour fitting to the game world (Jørgensen, 2009).

3. The game world needs to allow players to fulfil their avatar's behavioural role; a more convincing and accessible spatial and social environment can help players identify their roles easily and build up their immersion (Hefner, Klimmt & Vorderer, 2007).

It is important to mention that these criteria do not cover all factors which define individual relationships as this research is not able to maintain such large scope. The introduced factors are considered as one of the most impactful factors on player experience as they are perceivable in most role-playing video games, making them an inevitable part of any design.

Phase Two: Customized Artefact (Video Game)

To be able to gather quantitative and qualitative data and measure attachment between the players and their avatars, a customized and playable artefact representing a role-playing game genre was made in Unity 3D. It was constructed by following the five-act narrative structure of a brand-new story as it was important for the research to gather fresh and unbiased responses from participants.
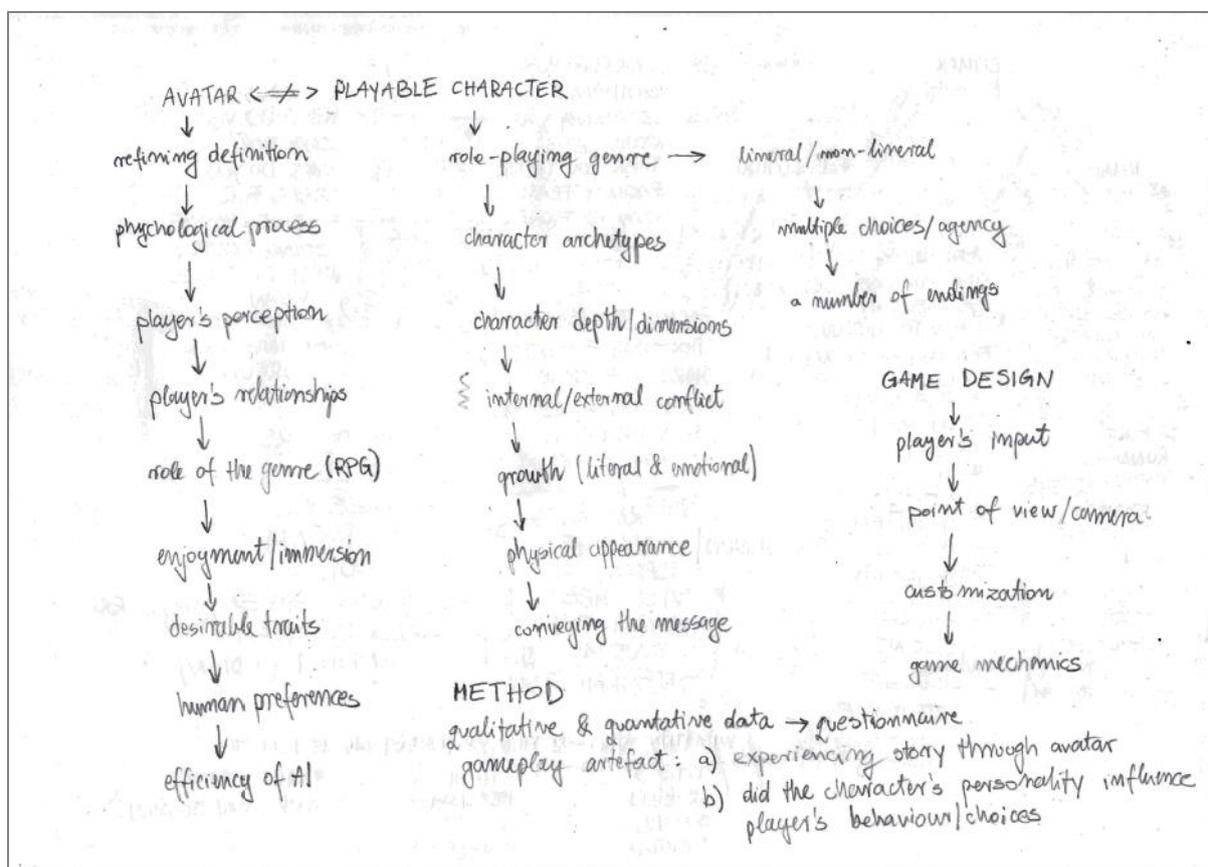

Figure 3: A list of topics discussed in the literature review and implemented into the artefact

After the research methods were chosen as seen in *Figure 3*, it was necessary to define their main structures. *Figure 4* describes the overall purpose of the playable artefact which was to deliver a character-driven story through a linear single-player game experience, and then measure participants' perception of their avatar throughout that story. Even though choice-making mechanics were implemented into the design, players' choices only change the gameplay enough to create an illusion of branching narrative to stimulate more perceived agency. This was done to respect the scope of this research as it was not possible to develop a high-quality non-linear narrative game in such short time. The screenshot also shows that the key element of the artefact was the in-game character development, meaning it focused less on game mechanics.
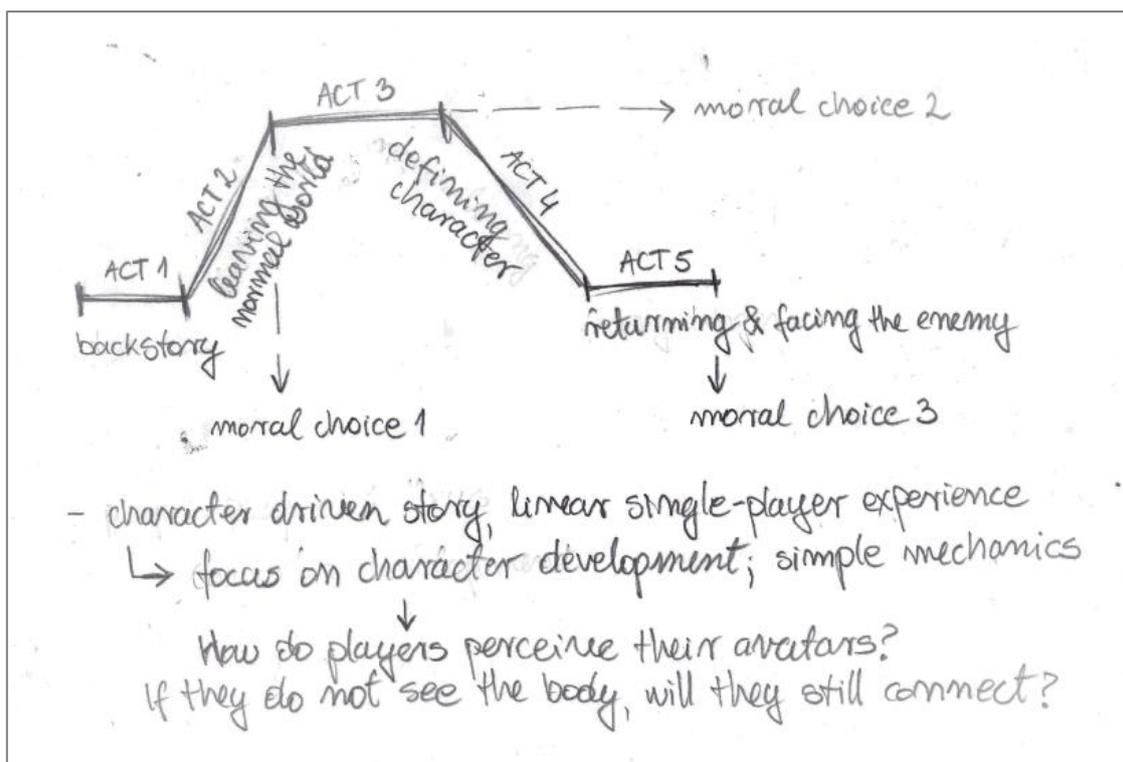
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Figure 4: The main structure and purpose of a video game artefact

Just as it was said in the menu scene, the artefact was made for research purposes and although this research considers all aspects of video games equally important to deliver a true gaming experience, the artefact mainly focused on the storytelling elements in video games. To ensure the most accurate data relevant to this research would be collected, the avatar controller's movement was temporarily disabled every time a dialogue was displayed on the screen. There was an option to skip dialogue, but it was highly recommended not to use that option in the first playthrough. Additionally, it was necessary to complete the entire playthrough in one sitting to define the player-avatar bond without interruptions, which approximately lasted about 45-60 minutes.

During their playthrough, the participants played as Artheus (a thoroughly detailed character with predetermined characteristics and behaviours), a special type of fantasy medieval warrior belonging to a group called the *Guardians*. In summary, after his kingdom had burned to the ground, Artheus found himself on the run, trying to adhere to his virtuous teachings in such dire times. Throughout all four levels, the participants were learning about the state of Artheus' world and his place in it. On a couple of occasions, the artefact offered several morally-conflicting choices which had different consequences. Whenever the participants were asked to make a choice, they influenced the story and the information provided to them, but the ending was always the same (a more detailed description of the design process is available in the game design document provided with this report).

By playing the artefact, the participants were exposed to similar storytelling techniques used in standard linear role-playing games – that is why it was important to introduce them to the brand-new world and create new emotional connections. Their playthroughs were recorded to determine what choices they had made and, even though they were not asked to provide any vocal feedback (to try and replicate their "natural" surroundings when playing such games), to monitor their reactions and potential reasoning to their in-game behaviour and will.

Phase Three: Post-Game Questionnaire

To be able to record and analyse participants' responses, a post-game questionnaire was made to gather both quantitative and qualitative data. The questionnaire was split into four sections. The first section gathered information on the number of participants included in this research, and their video game genre preferences as well as the game element most important to them. The four elements available were competition, achievement, exploration, and social aspects. These elements were offered to reveal what group of players participants fall into, following Bartle's (1990) categorisation of four-player types based on their habitual in-game behaviour.

The second section of the questionnaire collected data on factors influencing the player-avatar-character relationship. Since it is hard to accurately measure individual human experience and generalize it afterwards, quantitative data was collected on a linear scale from zero to four; zero meaning did not feel (as proposed) at all, and four meaning feeling distinctly (as proposed). Results were recorded as scores on two separate criteria: (1) defining the player-character relationship, and (2) defining the player-avatar relationship. Components and individual items were made according to the new model defining the player-avatar-character relationship as seen in *Figure 2*, and influenced by Li's et al. (2012) *Player-Avatar Identification Scale* (PAIS).

The player-character criteria consisted of six components and fourteen items in total. The components represented factors such as empathy, sympathy, projection, detachment, player-character comparison, and growth as seen in *Table 2*. The individual items measuring each component can be seen in *Appendix 2*.

Component	Player-Character Relationship Criteria (P-CRC)
Empathy	The player shares the same emotions with the character (if the character is crying, the player experiences sadness which would make them cry too)
Sympathy	The player feels certain emotions towards the character (if the character is in pain, the player feels sorry for them)
Projection	The player has an active role in the creation of the character's identity (the player can influence the character's personality)
Detachment	The player does not feel an emotional connection with the character (the player is only interested in the character's functionality)
Player-Character Comparison	The player compares their personality with the character and makes choices either depending on their personality or they temporarily adapt to the character's personality
Growth	The player experiences change in the character's emotional arc when making choices in moral conflicts

Table 2: Criteria for defining the player-character relationship

The player-avatar criteria consisted of three components representing factors such as presence, behavioural role, and world interaction as seen in *Table 3*. The eight individual items belonging to each component can be also seen in *Appendix 2*.

Component	Player-Avatar Relationship Criteria (P-ARC)
Presence	The player senses their agency without necessarily having their avatar displayed on the screen (player's actions do not need to be projected through a displayed avatar to make them feel their presence in the game)
Behavioural Role	The player takes on a role (not a *character role* with characterisation or a degree of personality) which automatically determines what behaviours and social functions are possible in the game world
World Interaction	The player fulfils his behavioural role through the interaction with the game world (for example, convincing spatial, social, and intelligent AI environment facilitates more connection between player and the avatar)

Table 3: Criteria for defining the player-avatar relationship

The third post-game questionnaire section gathered qualitative data because individual feedback was important to understand if different types of players can perceive proposed factors as the main influencers for the creation of their player-avatar relationships. This section consisted of three questions regarding (1) participants' immersion and avatar's aspects which contributed to it the most, (2) the reasoning behind participant's choices, and (3) avatar's body and its influence on participants' connection with their playable character. The mentioned questions can be viewed in *Appendix 2*.

Lastly, the fourth section of the questionnaire heavily influenced by Sweetser's and Wyeth's (2005) *GameFlow Criteria for Player Enjoyment in Games* gathered quantitative data about the quality of the artefact's design. The criteria are related to Csikszentmihalyi's (1990) elements of flow which describe the path towards an optimal psychophysical state of enjoyment. It had the same linear scale as the criteria for determining the player-avatar-character relationship, and it consisted of seven components and twelve items slightly adjusted to this research's needs (see *Table 4*). This section was incorporated into the questionnaire as it was necessary to evaluate whether the actual game design impacted the accuracy and validity of results related to the player-avatar relationship or not.

Component	Game Quality Criteria (GQC)
Concentration	• players should not be distracted from tasks that they want or need to concentrate on • games should quickly grab the players' attention and maintain their focus throughout the game
Challenge	• the level of challenge should increase as the player progresses through the game and increases their skill level • games should provide new challenges at an appropriate pace
Player Skills	• players should be taught to play the game through tutorials or initial levels that feel like playing the game • game interfaces and mechanics should be easy to learn and use
Control	• players should feel a sense of control over their characters or units and their movements and interactions in the game world • players should feel a sense of control and impact onto the game world (like their actions matter and they are shaping the game world)
Clear Goals	• overriding goals should be clear and presented early
Feedback	• players should receive immediate feedback on their actions
Immersion	• players should become less aware of their surroundings and less worried about everyday life or self • players should feel emotionally involved in the game

Table 4: Criteria for defining game quality

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