Making Sense of a Game

A look into Tutorials and Character Mechanics

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Att förstå sig på ett spel

En överblick på handledningar och karaktärsmekaniker

Abstract

This paper researches how information in game tutorials can be retained by the player. We use a teach-back framework to see what information the participants' retained. The purpose of this study is to understand how a video game can communicate vital information about character mechanics and rules with the help of tutorials integrated through level design. This qualitative study was conducted with 15 participants, they played through a *Third-Person Action Platformer* game which the authors created for this study. The participants were all experienced in this game genre for the sake of the results' consistency. The results showed that the most effective method is the one that presented most text and restricted player freedom, that being said it is not the preferred method by the participants. This resulted in suggestions that differed from what is presented to them, some of them including demonstrations in the game world and even some audio elements that could be implemented instead of having a text-based tutorial.

Keywords: tutorial, teach-back, level design, qualitative study

Abstrakt

I den här studien undersöker vi hur information i spelhandledning kan bibehållas av spelaren, vi använder en undervisningssammanfattning för att se vilken information deltagarna behöll. Syftet med denna studie är att förstå hur ett videospel kan kommunicera viktig information om karaktärsmekaniker och regler med hjälp av handledning integrerad genom nivådesign. Denna kvalitativa studie genomfördes med 15 deltagare, de spelade genom ett *Tredje-Person action Platform* spel som författarna skapade för denna studie. Alla deltagarna är erfarna i den här spelgenren för att hålla resultaten konsekventa. Den mest effektiva metoden är den som presenterade mest text och begränsade spelarens frihet men det var inte den föredragna metoden bland deltagarna. Det här resulterade i förslag som skilde sig från vad som presenterades för deltagarna, några av de förslagen inkluderade demonstrationer i spelvärlden och vissa ljudelement som kunde ha implementerats istället för att endast ha en textbaserad handledning.

Keywords: tutorial, lära tillbaka, nivådesign, kvalitativ studie

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1. Introduction

Throughout the years video games have had different methods of teaching the player how to maneuver and utilize the different mechanics that are presented. A tutorial is a form of teaching for a lot of mediums these days. In games, the purpose of tutorials are to let the player understand how to play the game and how they win. Juul (2005, p.58) explains that video games have rules so the player knows the limitations and actions they have access to, what needs to be done in order to cross the finish line the way it was intended.

In this qualitative study, an experiment using teach-back tasks (Puerta-Melguizo, Chisalita and Van der Veer, 2002) was conducted to see how much of the character mechanics a participant learned after playing a tutorial level designed by the authors of this paper. The character mechanics are in this case what the character controlled by the player is able to do in the game, for example jumping, attacking etc. It has been argued that in order to reach an alternative methodology within game studies building an experimental game is required (Mateas and Stern, 2005). A tutorial game was created by the authors for this study in order to maintain control and create an environment specific for the needs of our study.

Andersen, et al. (2012) writes about the following points on tutorials: *tutorial presence, context-sensitivity, availability for help* and *freedom*. These aspects and elements have been taken into account when designing the tutorial for this study. There are three different intensity levels regarding how much information about the character mechanics is being provided to the participant, the four aspects that Andersen et al. (ibid) presented are all relevant as to how the intensity levels were designed and implemented. An example of this is that context-sensitivity signifies if the information comes from within the game or outside of the game (ibid, p.60). With this in mind, we decided to include all information in the game for all three versions of the game.

This thesis is structured as follows, first we introduce the related research and the research question. Next the method of study and explanation of how we created the prototype, this includes the data gathering, the game and the level design, the mechanics and the data analysis.

Afterwards, the thesis continues with showing the result of each intensity level alongside interview quotes. The discussion and conclusion are presented in the last sections of this paper.

2. Related research

Andersen, et al. (2012) investigated the relation between game complexity and tutorials. Their study show that the usefulness of tutorials varied depending on game complexity, and even though game time spent increased with 29% for the most complex games it did not improve player engagement. To explore and explain the differences depending on game complexity Andersen et al. (2012) presented four characteristics in tutorials, which were mentioned before:

- **Tutorial presence**, whether or not there is a tutorial present in the game.
- **Context-sensitivity**, if the tutorial was presented within the game or not.
- **Availability for help**, if the player was able to access help with the press of a button.
- **Freedom**, whether or not the player is forced to perform a new specific action/mechanic at a specific area of the level.

Their findings also highlighted that players learned more by exploring rather than reading. They also believe that designing intuitive levels for the early stages of the game so that the player can discover the game mechanics is the most effective way of teaching the game to a player (ibid). They claim that players prefer not to read, yet a lot of modern games still include written instructions to teach the player in some form or other. This helps us to design the tutorials in our experiment. Some examples of this are South Park: The Stick of Truth (Ubisoft, 2014), Cuphead (Studio MDHR, 2017) and Dark Souls 3 (From Software, 2016).

Juul (2005) writes about that when a player spends more time with a game their skill will improve with it, he also brought up the importance and significance of rules within games. These two factors are both motivation and inspiration as to how to design the tutorials that were tested in this study.

However, when talking about human learning as a whole there is a plethora of material available. When touching on the subject of reading, reading comprehension, word coding and understanding is brought up. In this case word coding is to identify the word, understanding is to

interpret (Larsson, Nauclér and Rudberg, 1992). These two are used to compensate when reading and is a natural process, it's also mentioned when reading, if a person is only focusing on word coding they will not take in any information. This means that the person will have full focus on a singular letter, chaining together the rest of the letters to form one word and then the same for the rest of the words in that sentence (ibid). By having more text to focus on the reader might experience difficulties to understand everything in one of the three variations of our tutorials, taking this knowledge into account might give us a deeper understanding as to why participants might comment negatively on levels with specific intensities.

Shannon and colleagues (2013) conducted a study on learning through educational games where they describe how good feedback is an essential component in learning. The benefits of including well-timed, appropriate feedback are the following:

1. Helps the student understand good performance.
2. Provides information that helps the student self-correct.
3. Provides opportunities for students to self-correct.
4. Promotes self-assessment during learning.
5. Praises effort and focuses on learning goals.
6. Encourages dialog among teachers and peers.
7. Helps teachers shape teaching.

Their results show that a combination of immediate positive cognitive feedback, affective support, short bursts of just-in-time instruction with minimal text, prominent visual cues and step-by-step scaffolds that fade into free play over the course of the exercise is what results in effective learning (Shannon et al., 2013, p.7). The most relevant points for our study are 1 through 5 since points 6 and 7 are specific for a school environment. Points 1 through 5 on the list describe a natural learning process achievable by letting the participant explore an intuitive environment. Shannon et al. (2013) emphasize in their conclusion that a good tutorial should have positive feedback with minor texts to read (ibid, p.7), we wanted to see how the response would be translated to a game tutorial by using tropes and methods that are present in both modern and older games. Examples of older games are Super Mario 64 (Nintendo, 1996) and Oddworld: Abe's Oddysee (Oddworld Inhabitants, 1997).

Puerta-Melguizo, Chisalita and Van der Veer's (2002) study investigates assessing user manual models in design and complex systems. In their study they highlight a specific method to investigate mental models, in other words to see what the subject has learned. This method is called the "teach-back model" and lets a subject describe what they just learned to another imaginary individual in whichever way they feel like, it gives them creative freedom in describing the subject at hand. Their findings suggest that this model has limitations but the aforementioned creative freedom is the biggest quality it has to offer that makes up for it (ibid, p.6).

Flodén (2017) conducted a study on how players with various encounters in recreations can learn and experience a tutorial. The purpose of Flodén's study was to get a better understanding about the application of tutorials and how it can be adjusted for different types of audiences where the study explores the textual and visual based tutorials. This is a qualitative study and used a *First-Person Puzzle Platform* game that Flodén designed to test the applications of tutorials. His findings show that the tutorial must be adjusted so that the target audience can understand, control and play the game (ibid, p.34). Our reasoning for utilizing this study is to see if the results of both studies have anything in common since the core subject is one and the same. Depending on the similarities we might be able to add or subtract to the work that Flodén has presented and hopefully learn something new.

In order to create clear and recognizable environments within our prototype we took Hullett and Whitehead's (2012) paper as a reference point. They write about design patterns within *first person shooter* levels. By following their definitions and examples we can create similar environments for a different game genre. An example of one of these areas from their text is called a *sniper location*, in their sense it gives the player a safe area with a view over the enemy (ibid, p.82), in this study the player would have an overview of the enemy but cannot attack from afar. Another area is called an *arena* which they describe as a large open area where the player has to face enemies (ibid). By having these types of patterns, it could support the notion of having an early intuitive level meant to teach the player like Andersen et al. (2012) wrote.

3. Research Question / Purpose

The central research question of this study is: *How can a video game communicate vital information about character mechanics and rules with the help of tutorials integrated in the level design?*

In asking this, our goal is to achieve a better understanding of text-based tutorials in video games, how they convey information about the character mechanics to the player and what the benefits and disadvantages are with the three different methods we present.

An essential factor of the study is to find out if the participants' understood the most vital aspects of the character mechanics, what the participants prefer and if the different methods affected their learning experience in any way. A participant may prefer a certain method but gathered data might suggest that another method is most suited for experienced players.

Additionally, we explore how level design could motivate some of the participants' choices and if they had any specific impressions about the level design. This is because earlier studies we have brought up relate to level design while talking about teaching moments.

4. Methods

4.1 About the game

The game the participants' played was a *Third-Person Action Platformer* where the player is controlling a humanoid character in a third-person view with the help of an Xbox One gamepad for the input. The environment the player is presented to is a tutorial environment. The tutorial environment in this study is a self-paced instructional level that provides step by step information to the player. The information is the mechanics the player will have to use at critical points in the level.

4.2 Participants

As mentioned before the minimal experience required is at least five years for this game genre. With this in mind, a convenience sampling was chosen by recruiting students at Södertörn University and friends of the authors. The reasoning behind this is so that less time is spent on guaranteeing their experience with this type of game. So when asked if the potential participants had five years of experience it is meant throughout their life and not five years in a row. We deemed five years to be enough time spent with the genre so that the participant could be classed as an experienced player.

In the results section of this text, each group will be presented by the intensity level they played and the corresponding interviews will be presented after each table. It is worth noting that every interview is translated from Swedish to English.

4.3 Intensity Levels

In the case of this study we came up with the term intensity level, each level represents how much text is displayed and given to read to the player. All three intensity levels are based of Andersen et al. (2012) and Shannon et al. (2013) studies.

In the case of Andersen et al. (2012, pp.59 - 61) it is how the tutorial is represented if at all. The design behind the intensity levels was done by following their points about "*tutorial presence*", "*freedom*", "*context-sensitivity*" and "*availability of help*". Tutorial presence affects the fact if there is a tutorial for the player to follow or read. Freedom within a game means whether or not the player is forced to perform a new specific action/mechanic at a specific area of the level. Context-sensitivity for a tutorial is divided into two categories: if a game provides information from within the game and those that provide information from outside of the game. Availability of help within a game gives the player an option to actively seek help within the game.

As mentioned in earlier sections of this paper, Shannon et al. (2013, p.1) highlight the perks of positive feedback. The intensity levels in our study use feedback for the player in two different ways: one is short sentences with positive feedback alongside encouraging words and the other uses extensive explanations and less positive feedback. We chose to present the opposite of Shannon and colleagues' (2013) statements regarding positive feedback for one of the intensity levels to be able to identify more clearly the preferences the participants had. This was implemented with Larsson, Nauclér and Rudberg's (1992, pp.11-13) claims about reading comprehension.

Each level is affected by freedom in the same way, every viable action has to be performed in a specific area of the level and that all context-sensitivity comes from within the game itself. The three intensity levels are structured as follows:

- **Level 1**. No information is presented textually. The only information the participant gets is that they have to lead their character from start to finish. By the definition of tutorial presence, this version has none since the only thing guiding the participant is the level itself.

- **Level 2**. The player has access to signs scattered in the critical areas of the level meaning that this version has a tutorial present. The player needs to approach and press a button to read the sign making them completely optional and re-readable. The texts presented in this version are short with positive feedback.

- **Level 3**. In this version the player is forced to read instructions about the mechanic in each area that it is needed. They are able to re-read the same information if needed through signs that are spread out throughout the level. The texts presented in this version are longer and has neutral feedback, it is deliberately monotone meaning that it is neither positive nor negative feedback.

4.4 Level Design

The level design of the tutorial level is simple, straightforward and meant to introduce the player to the new mechanics step by step in each section of the level. These choices were made with former studies in mind such as Hullett and Whitehead's (2012) paper that describe apparent patterns in the level design of FPS levels. The aim, regarding the level design, is to achieve pedagogical results by following a pattern system like this one. Andersen et al. (2012) mentioned as a conclusion that there should exist simple and easy to understand levels in order to improve the learning experience of the player, this motivates our linear vision for the level. Additionally, Totten (2014, s.43) writes about how the adjustment of behavior is affected through level design, this means that the layout in front of them affects the players next action.

4.4.1 Level Layout

Presented below is a quick overview of the level the participants had to go through. Every image was captured in intensity level 2. The only difference in level layout between intensity level 1 through 3, is that level 1 does not have any signs placed anywhere in the level.
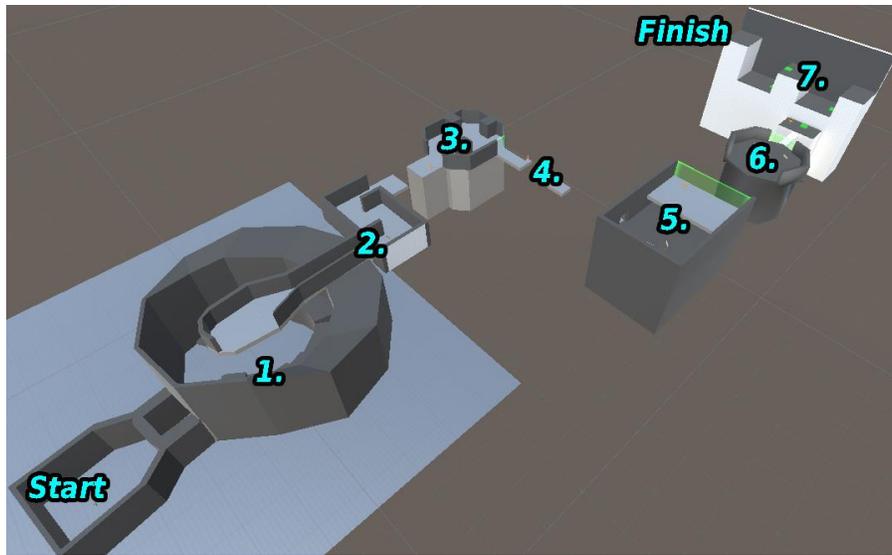
Figure 1. *An overview of the whole level. Every participant proceeded through the level from start to finish, no alternative routes are included.*
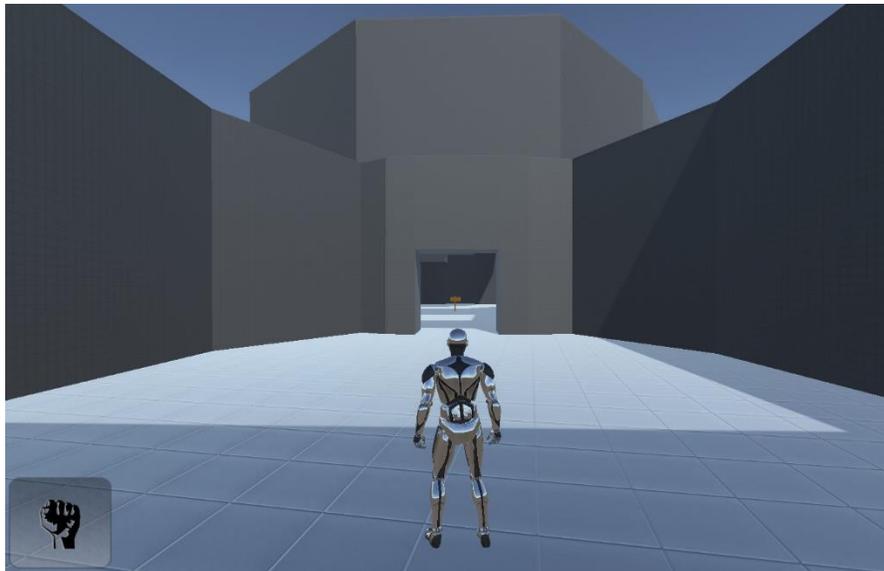

Figure 2. *After receiving the first introduction message, the starting area leaves the player facing in the direction they need to go. From here they could see the first sign.*

Figure 3. *Area 1. Here the participant sees the first sign from close (A), the giant spiral staircase they need to climb (B) and a large platform where there could have been a roof (C).*
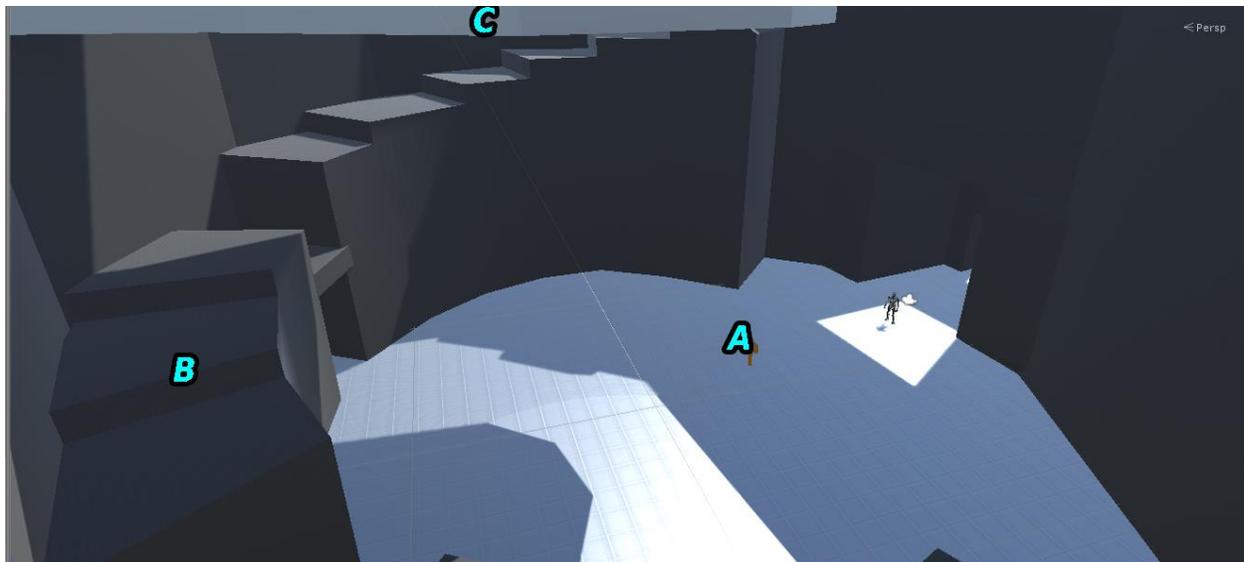

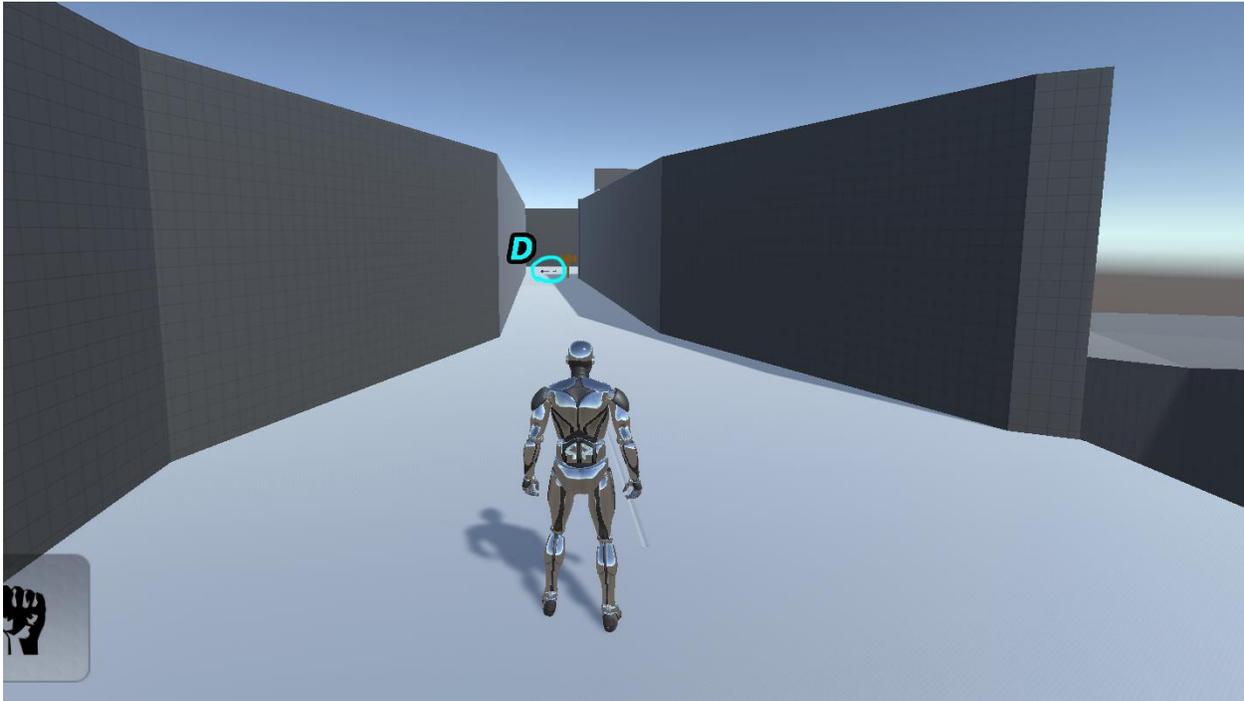**Figure 3.** *Different angle of area 1*

Figure 4. *Participants' first look at area 2. The player can see a sign and the club (D) they are able to pick up.*
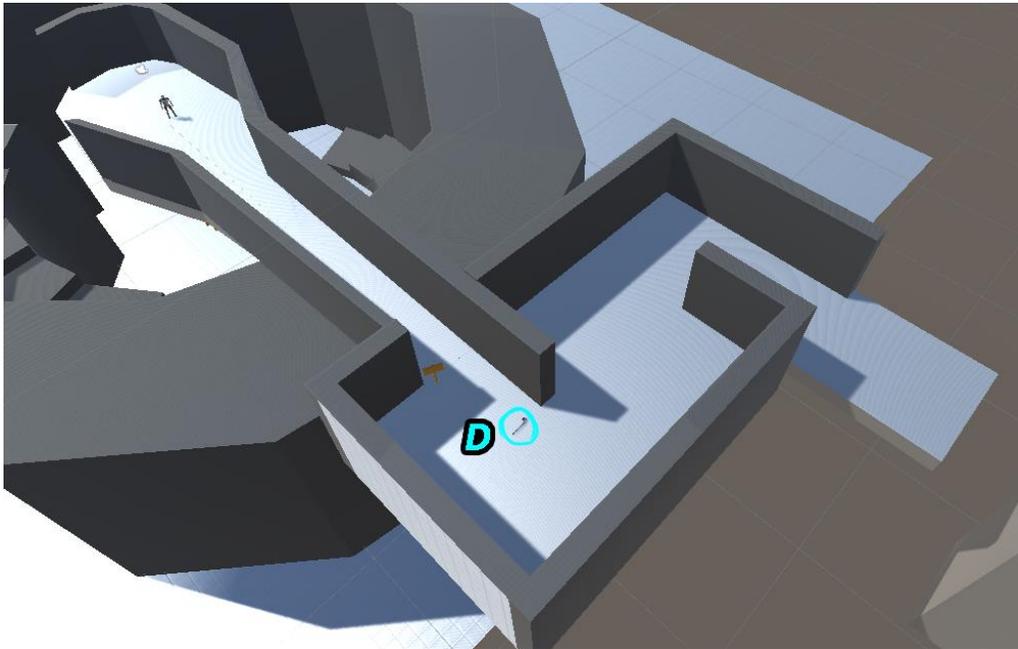

Figure 5. *An alternative view of area 2. The player has to jump the first chasm of the game at the end of this area.*

Figure 6. Area 3. This is the first area with an enemy (E), this also includes a force field (F). The force field disappears after the enemy is defeated.
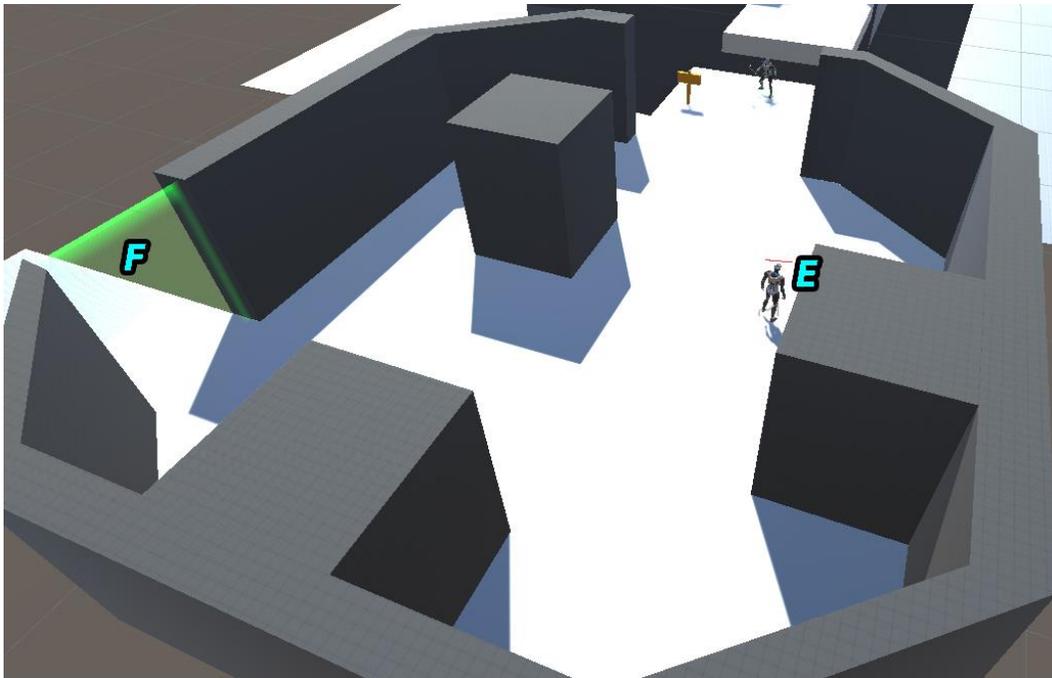

Figure 7. *An alternative angle on Area 3.*
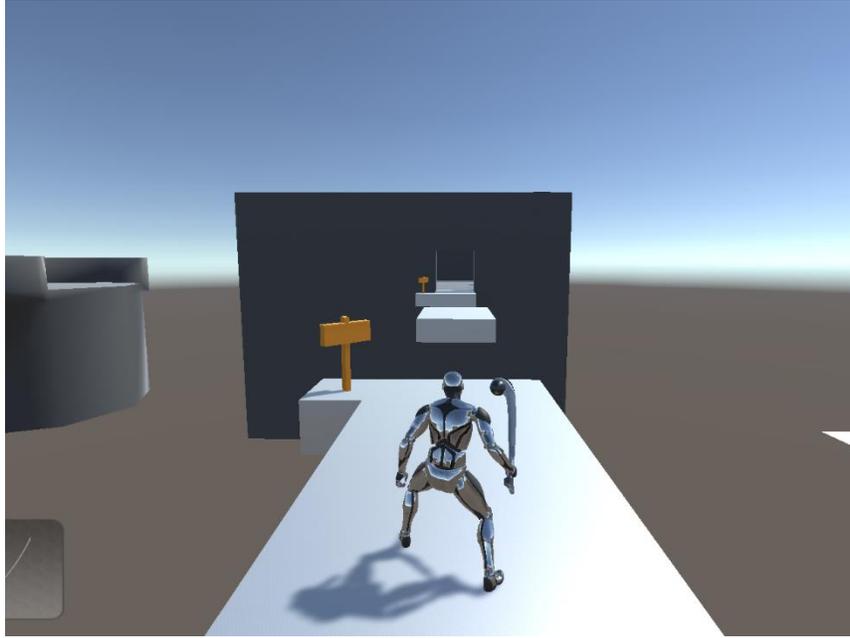
Figure 8. *Area 4. This is where the player needs to air dash to cross these larger gaps.*

Figure 9. *Area 5. Here awaits another enemy. To the right is a ramp (G) that lets the participant reach the upper left area. They need to air dash to do so.*
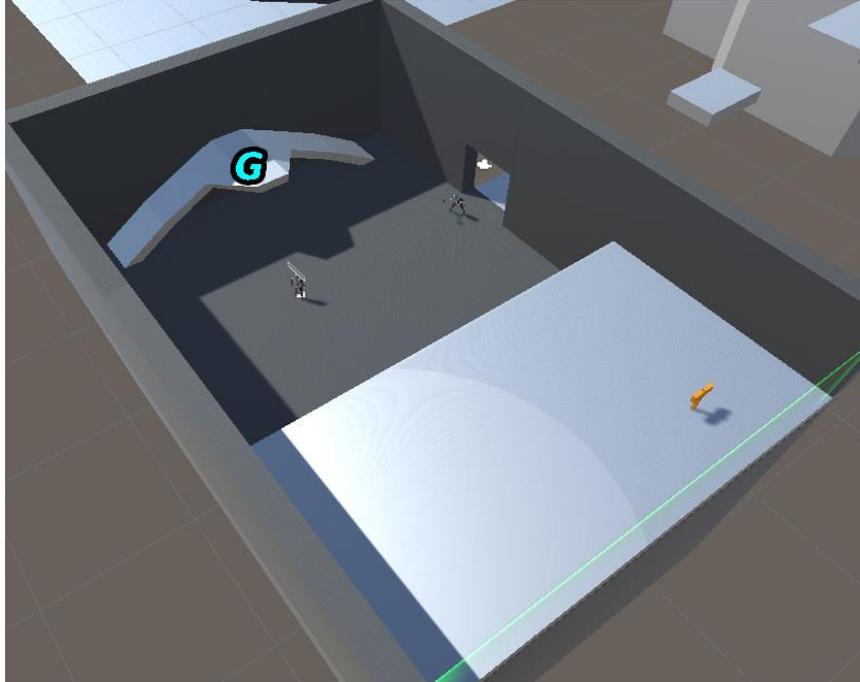
Figure 10. *An alternative view of area 5.*
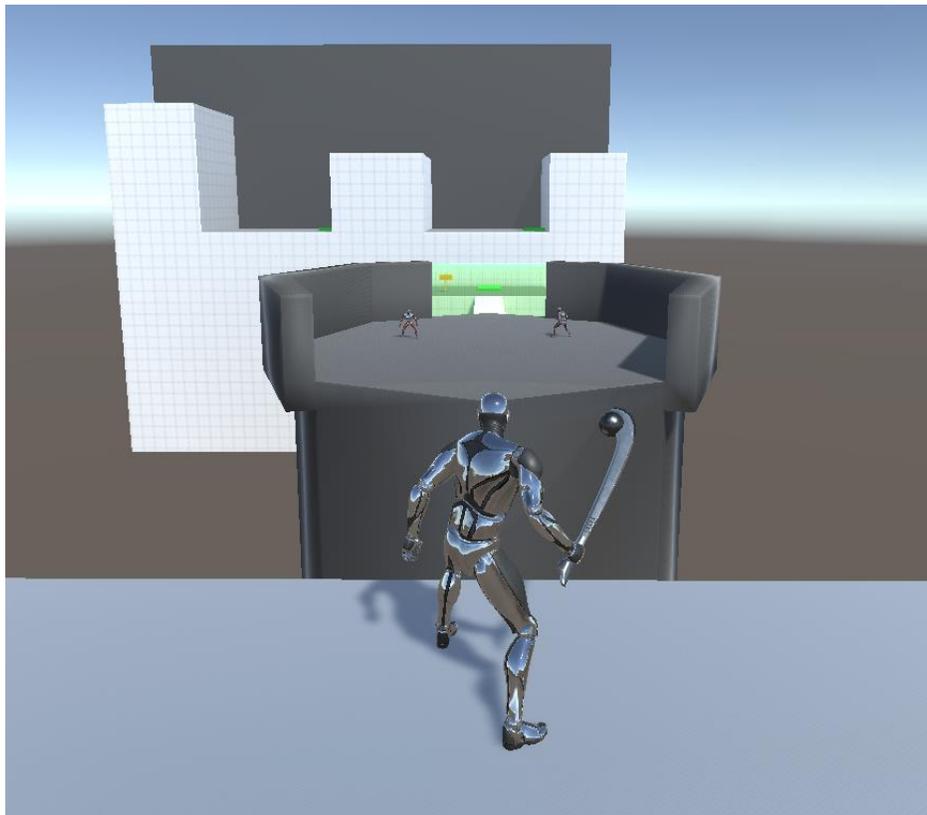
Figure 11. *The platform in front of the player character is area 6. There await two enemies with swords, the green force field disappears after both enemies are defeated.*
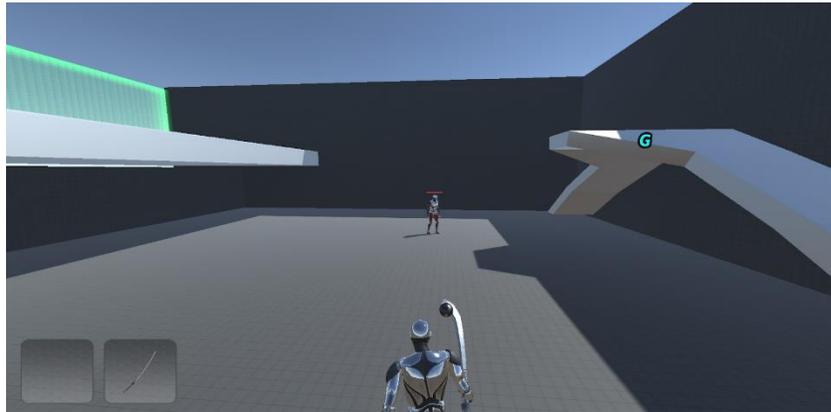
Figure 12. *An alternative view of area 6. Also displaying the distance the player needs to cover to get to area 6.*
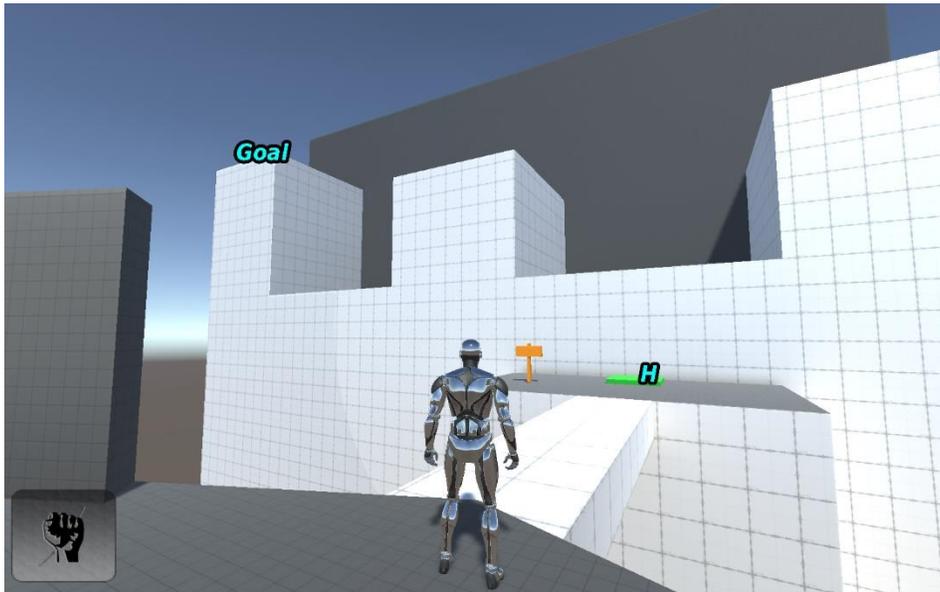
Figure 13. *Area 7. The final area of the game, it includes a jump pad (H) and the goal itself. By landing on that platform the participant is done with the test.*
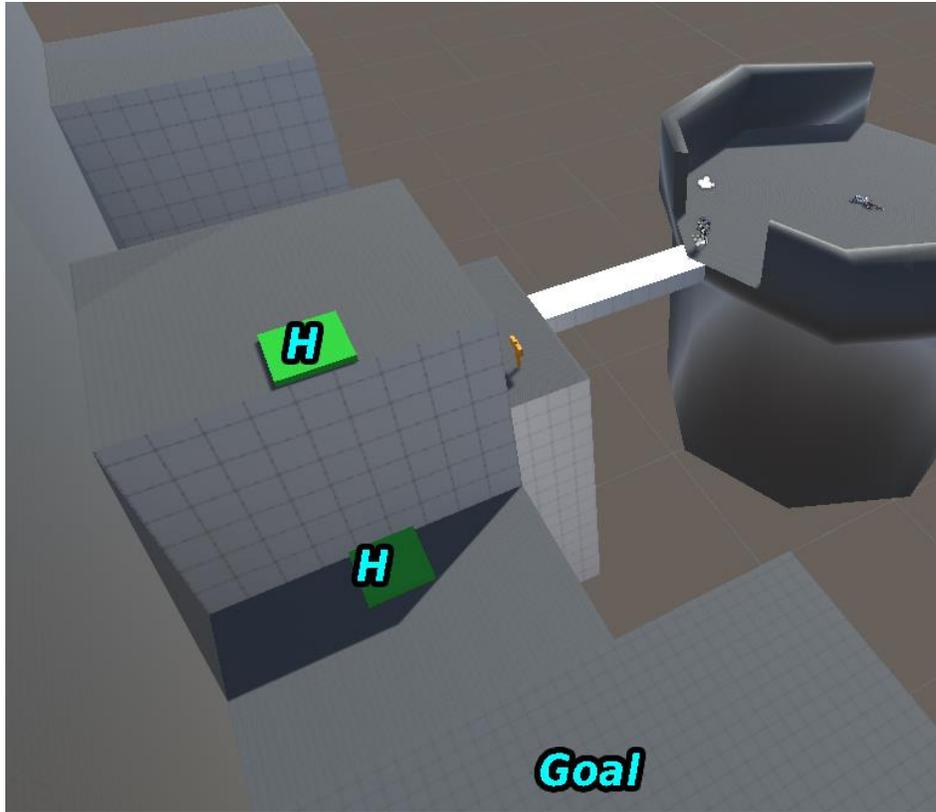
Figure 14. *Alternative view of area 7.*

4.4.2 Mechanics

The mechanics that are available to the player and how to execute them are listed below.

- **Jump**. Press the "A" button on the controller.
- **Double jump**. Press "A" once more in the air after jumping a first time.
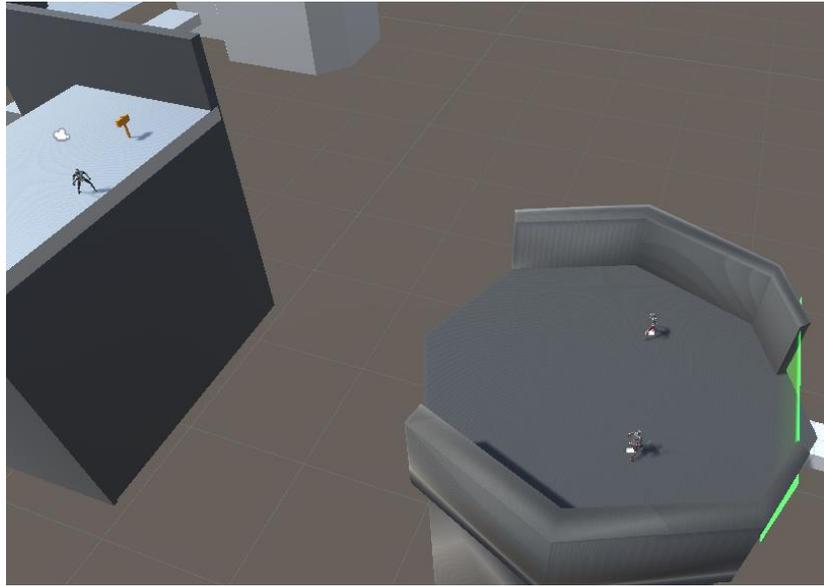- **Dash/Air-Dash**. Dash in the direction the character is facing by pressing "B" on the controller. Doing this in the air is considered an air dash.
- **Sprint**. Hold the left bumper (LB) button to run at a faster velocity.
- **Attack**. The player attacks by pressing "X" on the controller. If the player is holding the weapon the swing with it instead of throwing punches and kicks.
- **Interact with signs**/**pick up weapon**. Press to "Y" to read signs or pick up the weapon by standing close enough to the object.

The objective we have set for the players is to clear the level, this can only be done by using certain mechanics and specific stages in order to advance. By designing the level this way, we

can identify if the player has learned or discovered new mechanics in order to progress. However, there is still room for errors if the player is not paying attention and might lead to the participant not retaining the information the game is trying to teach.

4.5 Data gathering

The participants' experience could not be proven in any distinctive way, their claim was enough to participate. The prototype game that was created to study the research question was split in three different intensity levels.

After the game session, a short semi-structured interview was held with each participant based on Cote and Raz's (2015, pp.103-104) method. The participants were first asked "If you were to explain this game to a good friend, how would you describe it?", this is the main question and is based on what Puerta-Melguizo, Chisalita and Van der Veer (2002) used in their study and it is called teach-back. This gave the participant creative freedom and let us continue the interview more naturally. After the participants were asked if the tutorial and level design method mediated the instructions the participants needed or if the participants would like to add or remove something, depending on what intensity level they played.

4.6 Data analysis

After the interviews were held and a transcription was done, a simple word count analysis was held to control if the participants had fully grasped the 6 main character mechanics. This analysis was inspired by the thematic analysis presented by Braun and Clark (2017). Executing this analysis was to identify similarities and differences between each participant outside of character mechanics. Whenever a specific theme was brought up such as gameplay mechanics, level design, comments about the tutorials or anything else which was out of the ordinary they would be marked as interesting with a corresponding color in the transcription. This helps to identify alternate results that might be of use to this study, which method was most favored as opposed to which method was the most effective regardless of what the participants preferred.

5. Results

5.1 Common ground

Something important to note in every intensity level is that each participant here was able to clear the game without having to restart the game or having similar technical issues. If a participant has less than 6 mechanics learned, in the case of this study it means that every viable mechanic was used at one point but that they failed to retell all of the character mechanics to us when we asked them to explain what the game was about.

5.2 Intensity level 1

Not a single participant managed to recount every character mechanic when discussing them at this intensity level. The most common mechanics that were left out, in this case, were sprinting and interacting/picking up the weapon.

Participant	Mechanics learned (6 being all of them)
A1	4
B1	5
C1	4
D1	5
E1	3

Table 1. Results for intensity level 1.

In this intensity level each participant described the game as a 3D platformer of sorts with combat aspects included for variation. Every participant failed to convey the fact that they were able to sprint in the game. However, participants would sometimes bring up character mechanics when asked about the level design itself.

Participant A1 and C1 said the following when asked if they ever got lost in the level:

"That would be in the beginning when I did not really understand that you could *double jump* and *double dash*, I got stuck in the round room." (Participant A1)

"It was pretty good (the level design), considering that I got confused by that big jump [...] well because I knew that I could dash but was I able to do it in the air? I tried it but then it made me think: 'Am I able to do this twice in the air in some way?' So the whole 'being lost thing' was nice in that way." (Participant C1)

In this instance, C1 was specifically talking about how an abstract obstacle led them to try different approaches to solving the problem in front of them and therefore discovered the fact that they could and needed to dash twice in the air.

Some participants managed to identify the scaling difficulty and special areas that were deliberately designed in the project. Some of the more noticeable quotes regarding this are presented below.

"So I prepared myself to meet the enemy, and the first enemy was there." Participant A1 when talking about seeing the weapon on the floor.

"The first room was to use jump and then there was a gap where regular jumps did not work so you had to double jump. [...] after pressing the different buttons I discovered a dash button and that it could be used in the air to proceed. [...] it was very clear what one needed to do based on the things that you were able to do." Particiant B1 when describing the environments in the game.

"So I felt like 'Oh, at the start I learned how to jump and in the next (room) there is an enemy' [...] and then at the end there was a 'final test' where one has to master mobility and fighting two enemies at once." (Participant C1)

"...It felt like it kept escalating bit by bit, [...] the farther you got the more difficult it got with bigger 'gaps' design wise. As an example, those stairs by the end where I defeated an enemy, suddenly it was empty [...] at that point I felt that the way I played had to change" Participant E1 was referring to Figure 9 and Figure 10, position G in the image, where the player had to dash in the air to get to a higher level.

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When it came to the tutorial method of this intensity level the most interesting comments came from participants D1 and B1. D1 explained:

> "My proposal is mostly based on other games that I've played in the past. So an appearing prompt is very common. [...] so that there is something in the middle of the screen saying 'push X to jump'[...] in some fighting games there is a canvas with the button combinations and a video on what those buttons do."

At the same time participant B1 enjoyed the freedom but still had something to ad:

> "... I would have enjoyed maybe another character moving to show you how you are supposed to do it. Some sort of NPC or something along those lines."

5.3 Intensity level 2

Similar to the previous intensity level, none of the participants managed to count up every character mechanic when discussing them in this intensity level.

Participant	Mechanics learned (6 being all of them)
A2	4
B2	5
C2	5
D2	5
E2	3

Table 2: *Results for intensity level 2.*

A very common theme that arose in this group was the identification of the scaling difficulty. All except one participant in this intensity level noticed a shift in said difficulty throughout the level and had comments about it.

Each participant said the following when asked about the game environment:

"It started very easy, safe environment, simple with the movement, simple jumps and later it gets harder and harder, that was really good I think. [...] In retrospect it is easier to identify where it got more difficult, for example after the first encounter with the enemy, the platforming gets harder after that." (Participant A2)

"I started in… how do you say… A more restricting area, in that way that you could not fall off the stage and die at the beginning (of the game). And after you clear some basic jumps it got more difficult to the point that you could die if you failed on the jumps…" (Participant B2)

"... It felt like a very safe environment, because you could fall without dying instead you would just run back to jump up again. And then later on towards the end there were larger chasms and more challenging challenges." (Participant C2)

"... So it (the difficulty) developed over time, how one overcomes the obstacles… in a very beginner-friendly way[...]" (Participant D2)

"I would describe it as an environment that successively combined the mechanics that the player learned from the game, very much like Mega Man […] Because different sections taught me specific mechanics in the game to later combine them." (Participant E2)

An interesting aspect that was also discovered in intensity level 1 is that a participant also mentioned character mechanics when talking specifically about the environment. However, this time it was only one participant that mentioned something noticeable about the mechanics during the level design section of the interview. These comments would be made well after asked about the mechanics.

"Eh, and then it transitioned into that you could double jump and dash and so on and so forth[…]" Participant D2.

Participant D2 demonstrated later on the discovery of a new method regarding the mechanics through their own exploration.

"... 'So either I can jump-dash-jump-dash' but then I got to thinking 'can I dash once?' (once more) and that is when I realized that that was the case."

Although no concrete example was given, participant B2 confirmed that through their own discovery they were able to proceed through the game:

"... Some mechanics were given through signs before you needed them and others were confirmed after you used them (the mechanics), or figure them out in order to reach the next sign [...]"

When the signs of this intensity level were brought up, many of the participants had something to say about them, mostly how they would change the formatting of words, or how the instructions should be conveyed instead.

Starting with A2, they did not have a direct problem with the method of representing the tutorial, which was through signs that the player reads, but had a comment on the formatting of the text.

> "There were two signs that I thought were a bit unclear, that part when you get to know about the use of double dash. Either I did not read it thoroughly or the text didn't communicate clearly."

When asked if the only thing that needed was to make the text clearer about what it is referring to and how the mechanic is brought up there the participant simply answered "Yes".

Participant C2 found that showing the button inputs were useful but quickly got annoyed when continuing to advance through the level:

> "... But towards the end it felt a bit annoying to read all the signs. I felt like I needed to read them even though I did not have to read them [...]."

They mentioned that it was mainly towards the end, around the halfway point, these impressions arose, we then asked the follow up question if they would rather have no signs after the halfway point where they responded with:

> "Those things should maybe be said over voice instead of pausing the 'flow' by stopping and reading when instead a character can directly encourage you and say things like 'Good job with that jump!'[...].

Participant C2 later explained how other alternatives as opposed to text-based tutorials and their previously mentioned audio-based tutorial.

"... It would have been enough to have a picture of sorts in the environment instead of having a pop up text, where the pictured showed 'A' and an illustration of a character jumping so that you use 'visual cues in the real world', or have a type of hologram that pops up so you do not have to go and press 'Y'."

D2 also experienced some difficulties with the air dash mechanic and how many times it could be activated and wanted to change the information formatting:

"... 'Double jump will refresh your ability to dash' or something in that sense, is how I would express it."

Other interesting comments emerged when talking about different areas of the game. The most noticeable ones were directly related to their past experiences of games of the same genre. Participant B2 had difficulties understanding the rules of the dash mechanics, their reason for this were the signs and said the following when asked about it:

"Well, the only problem I had was that I did not understand that you could dash multiple times during one jump. I figured it out after a while [...] the most usual practice for jump dash combinations is that you have to land (on the ground) before you can do another dash in the air. So I assumed that this mechanic worked the same way. So I think that if a mechanic works a different way than how it does in other games an explanation might be needed for that detail. Especially if it is critical for the player's progress. Either that or that the game encourages the player to experiment with that mechanic [...]"

Participant E2 explained that cutting down the number of signs implemented would be a good idea in their perspective since they found a lot to be obvious in the level.

"... So I felt that 'well there is only one way to proceed' and that it was up the stairs, well let me try these button to make my way up."

In addition to all the comments about the signs, participants' C2 and D2 found the signs to be humorous to an extent, making them understand that the signs were somewhat important.

"There was a certain humor in the first sign I believe? [...] Which is good because that makes me understand that it is important." (Participant D2)

5.4 Intensity level 3

The only mechanic left out was the sprint mechanic in this intensity level.

Participant	Mechanics learned (6 being all of them)
A3	6
B3	6
C3	5
D3	6
E3	6

Table 3: *Results for intensity level 3.*

In this intensity level each participant described the game as a 3D platform of sorts with combat aspects included for variation, only one participant in this intensity level failed to convey the fact that they were able to sprint in the game. Each participant had at least one comment on the amount of text the participants received at this intensity level.

All the participants had the following to say about the amount of text on the tutorial:

"... You could probably do that, even more briefly ... Ehh, these texts were quite long" (Participant A3)

"Well, that is exactly (why) the pop-up might be a bit too much […] but I mean a lot of stuff is recognized so it's very intuitive what it is like. But I can imagine someone who has never played the genre before can think it is very nice. So for me ... I could have been without the pop-up but I understand why they are there." (Participant B3)

"And so it was the same text. Then I thought like this 'Well, but why do they have signs if it still comes out?' [...] There was a bit too long a piece of text to be able to read everything" (Participant C3)

"It seemed like it was the same instructions that popped up, I checked on the first sign, noticed it was the same thing and then ignored the rest (of the signs)" (Participant D3)

"The instructions were pretty simple ehh ... I would say that it is enough with just a small sentence instead of all the information that came up [...] And it did not feel like you had to stop the game altogether if you needed to have that information, it felt like it is something that could come up in some small box below." (Participant E3)

Each participant had a different opinion about whether the amount of text was positive or negative. Participants such as A3 and E3 would argue that the amount of text was too much and it would be simpler with a brief text instead or shorter but precise instructions. C3 would explain that each pop-up text that was included was something understandable to a new player but C3 would have rather not have the pop-up text.

Apart from the text-based tutorial, A3 and B3 claimed that the level design helped to clarify the text-based tutorial.

"The first part would teach you how to jump with the A button to get up the stairs because there are no other ways to get up." (Participant A3)

"Each part has a backdrop so that all mechanics are accounted for, like in the first part you just jump on the stairs in that way you learn how to use the jump mechanic. And then you start to doublejump, and then if I remember in the correct order, there is combat. [...] Oh! Right, there is sprinting as well." (Participant B3)

B3 gives the first part as an example on how the prototype's level design scales with the tutorial. The player is tested right away with the new found information they gain by the text tutorial to try out the mechanics to get further in the prototype. Another interesting discovery made by

participant B3 was that when asked about the environment the participant would mention about other characters mechanics, they did not mention in the question regarding the mechanics. This only applied to one participant but similar results are seen on intensity level 1 and level 2.

When the participants were asked about if they ever felt lost in the level they answered the following:

"Yes. No, I am just kidding. No, just that penultimate part where I had to kill that character to get further. I did not understand that I had to do that to get further." (Participant A3)

"Noo... It was more of, when you were supposed to go from the other room, up on the platform or walk up the platform and then jump over, there it went like, if you double jumped and then dashed then that didn't work that well but if you… jump, dash and then jump then it worked out. There I went like… 'Okay, does this even work?' But then you just test your way through…" (Participant B3)

"Yes, it was towards the end, this last thing before you make it, these things that has a form of… Jumping with these… Green platform, precisely." (Participant C3)

"Nope, I was not (lost in the level)." (Participant D3)

"Slightly, two moments in, this area with the bridge I think, first I did not know where I was supposed to go but it was just as easy as to rotate the camera and then come to a conclusion and see a different outcome, the areas I could reach. Then right after I failed with a jump down to the arena the camera was focused in a way, that I didn't feel familiar with where I was. So it felt like, well I also needed, to take a look around. But otherwise no." (Participant E3)

Each participant except for D3 felt lost in some way during the session. C3 and E3 felt lost orientation wise while A3 and B3 felt lost within their objective.

6. Discussion

Something important to note here is that this study was in comparison to Andersen et al. (2012), not on the same scale when considering the number of participants. We believe that in order to get more accurate results there is a need for more participants than the 15 we had, by doing that the study becomes more credible and can then prove the results as facts.

Another vital point to consider is that we needed to clarify interview questions for the first group that tested the game. In this case, we did not make the tutorial related question obvious for the first group that tested the game. The main reason for this was because we did not want to steer the interview and therefore possibly cutting off the participants thoughts. This resulted in fewer amounts of comments and responses regarding the tutorial method, however other comments pointed to an overall acceptance of intensity level 1 where the participant only relied on the level design for directions. The interview questions for the remaining groups should have been structured in a more detailed way so that a branch of questions could be accessed if need be. By doing this we would have had a more extensive interview per participant regardless of the initial answer to the main question, not all the participants used the exact same words to describe the game and by doing so left out some keywords we were looking for.

With this in mind, the teach-back method that Puerta-Melguizo, Chisalita and Van der Veer (2002) presented was a helpful tool to get the interviews started by simply asking the participant why they would give the answer that they did. Additionally, this should be used to investigate how a person perceives the technical tasks they have to perform.

A limitation we are aware of in this study is that it can be argued that each participant understood the games character mechanics by the mere fact that they finished the game without any major hindrance, the participant might have taken a little longer to clear the game but nothing more serious than that. The players were able to form "correct" mental models based on the affordances in terms of game mechanics they were taught by the tutorial. A factor that was not taken into account was time and how that might have affected the learning experience. Andersen and colleagues (2012) bring up play time and its impact in their study but did not take background into account the same way we did, in other words, our participants were experienced

players. As mentioned earlier, it is worth noting that because each participant managed to clear the game it means that they understood the game's rules. This is an indication that the player understood what they were able to do and how to utilize the abilities they possessed, this is what Juul (2005) talked about when discussing about the importance of rules and what the limitations taught the player.

Some participants mentioned that they might have misinterpreted information given to them, this could be directly connected to the way they received the information depending on the intensity level. This might be a direct connection to what Larsson, Nauclér, and Rudberg (1992) explained regarding word analysis. However, this is not something we could prove and is the other indication that we could have included more specific questions regarding the text itself alongside the questions about the tutorial method. Their book still provided insightful information about the process of reading and could be used for future studies regarding textual interpretation, even if it is for a tutorial.

One of the results that Andersen and colleagues (2012) presented showed that players learned more through their own explorations in the game, however, while our results show that there was a definitive positive response regarding this, the same participants did not manage to teach-back everything they had used and learned. This can be seen as an interesting find that further proves that a larger number of participants is needed for the type of study that we conducted. Another tutorial factor that Andersen et al. (2012) wrote about was the different methods of information that a game would provide. While we only chose a textual tutorial, they had three different games with different approaches to tutorials.

Flodén (2017) would also give more than one option, his being a visual and a text-based tutorial. This is an interesting aspect to consider since our participants often had suggestions of different ways to present the tutorial, it being through images, audio, simplified prompts or even a short presentation through another character. The comments regarding how the tutorial could have been presented were primarily from the group of participants that played through intensity level 3 which was the version of the game with the most text to read. The group that played intensity level 1 had the least amounts of complaints and enjoyed the freedom that was given to them,

with that said, some of the participants of that group would have wanted some sort of simplified text, something that was not as much to read and that would still let the player proceed with the text displayed. This was also true to the group that played intensity level 2, if it had to be text-based, let them read without forcing the participant to stop what they were currently doing in the game. Furthermore, between intensity levels 2 and 3 the participants for intensity level 2 were the most content largely because of the shorter texts they got from reading a sign. This can be argued as being related to what Shannon and colleagues (2013) wrote about regarding short, positive and well-timed feedback. The fact that these participants took notice of this is proof enough that these types of feedback can be used regardless of the tutorial method since the "humor" is not exclusive to text-based tutorials alone. The fact that only a handful of participants took notice of the writing style and have found it humorous can be interpreted as the rest of the participants did not have a special reaction to the writing style.

In contrast to Andersen et al. (2012) and Flodén (2017), rather than having both experienced and inexperienced players of vastly different ages, our study benefitted strongly by only including experienced players. It helped us get a better overview of what was advantageous to their learning experience and what was not.

Lastly an interesting find was done in all intensity levels when our participants were asked about the level design. The questions in themselves were asking if they could describe the different areas of the game and if they ever felt lost during the session. Some participants that failed to retell some of the character mechanics they had access to brought instead up missing character mechanics when they would describe the level design.

There is still room to expand within this subject, an example would be this very same study but with casual players that do not have the same type of experience as the participants we had. This way the explorations of tutorials can expand to casual players and later how to find a balance within a tutorial to see what method fits best between experienced and less experienced players. This would greatly benefit the understanding of tutorials in general as well as game developers looking to provide a specific demographic.

Our insufficiencies in this study, such as the interview questions etc., is something that would have been addressed but due to time constraints, it is something left out which will hopefully be an aspect to improve in future studies.

7. Conclusion

In this study, all participants managed to clear the game regardless if they could teach-back all of the character mechanics.

Looking at the results between all versions of the game, intensity level 3 proved to be the most effective method regarding "teach-back" but was also the most disliked intensity level out of all variations because of the constant forced stops and amount of text the participants had to read. Participants had some opinions on improvements for the intensity level but at the same time had an understanding as to why it could be positive to have a detailed tutorial presented in intensity level 3. Intensity level 1 had the best response based on the positive comments about the freedom the participant received and the lack of negative comments. The level design was the same for each intensity level and so each tutorial got the job done with each participant finishing the game.

Something each intensity level had in common was the fact that when asked about the level design, some participants described environments in the level by bringing up never before mentioned character mechanics. Additionally, it is important to note that these results are specific to our test group and that the results should be treated objectively. With this said, our results show that it comes down to finding the optimal balance between a tutorial's effectiveness and an experienced player's preference to complement the level design. We find these results to be satisfying in the sense that this study can be used as a stepping stone for a deeper understanding of tutorials in games and how they can be presented.

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