

Less Text, More Visuals: Evaluating The Onboarding Phase in a GWAP for NLP

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Abstract

Games-with-a-purpose find attracting players a challenge. To improve player recruitment, we explored two game design elements that can increase player engagement during the onboarding phase; a narrative and a tutorial. In a qualitative study with 12 players of linguistic and language learning games, we examined the effect of presentation format on players' engagement. Our reflexive thematic analysis found that in the onboarding phase of a GWAP for NLP, presenting players with visuals is expected and presenting too much text overwhelms them. Furthermore, players found that the instructions they were presented with lacked linguistic context. Additionally, the tutorial and game interface required refinement as the feedback is unsupportive and the graphics were not clear.

Keywords: Games-with-a-Purpose, Onboarding phase, Modality effect, Narratives, Tutorials

1. Introduction

Games-with-a-Purpose (GWAPs) can be a useful tool for collecting linguistic data (Poesio et al., 2013; Lafourcade, 2007; Guillaume et al., 2016). However, recruiting and retaining players of GWAPs can be a challenge. This challenge is relevant for GWAPs for NLP, as engagement is low compared to GWAPs of other domains (Von Ahn and Dabbish, 2004). One of the ways GWAPs attract players is by incorporating well-established game design elements (Segundo Díaz et al., 2022). Game design elements can enhance usability and enjoyment, which are both design strategies used to promote engagement (Doherty and Doherty, 2018). For instance, when certain game design elements are present in GWAPs, they can lead to a player's enjoyment (Segundo Díaz et al., 2022) and learnability (Andersen et al., 2012; Miller et al., 2019).

We are interested in examining enjoyment in GWAPs because enjoyment was identified as a motivator in GWAPs (Mekler et al., 2014) and can lead to player engagement (Boyle et al., 2016). Another factor that can lead to engagement in GWAPs is usability (Bowser et al., 2013; Bui et al., 2020). The usability of a game determines its success in engaging players (Hamari and Keronen, 2017). In GWAPs, learnability is a common usability issue that affects the recruitment and retention of new players. This is due to the steep learning curve found in some GWAPs that can negatively impact player engagement (Miller and Cooper, 2022).

In this study, we chose to focus on two game design elements found in a game's initial stages: the narrative and tutorial. We focused on exploring the elements related to the onboarding phase of the game, as onboarding is one of the first stages of a player's journey. At this stage, players are given a reason to play the game (Chou, 2019), and it is one of the most important stages when it comes to engaging players (Cheung et al., 2014). Engaging players of GWAPs during this

stage is a significant obstacle to overcome, as player engagement at this stage is what determines long-term engagement in a game (Shelley, 2001). This indicates that designing an appealing onboarding stage in a GWAP is crucial for promoting player engagement.

While the presence of tutorials (Andersen et al., 2012) and narratives (Prestopnik and Tang, 2015; Wang et al., 2015) were previously examined in GWAPs, the role of the presentation format of those two game design elements were not evaluated. Based on Cognitive Load Theory (Kirschner, 2002), information presentation is an essential aspect of instructional design in HCI. For instance, Mayer and Moreno (2002) propose that it is better to present instructions in both visuals and text rather than text alone. Hence, we believe that understanding the impact of the presentation format is a necessary aspect to explore in GWAPs.

This study asks the following research question "How do you introduce players to a GWAP for NLP, and do the different presentation formats of the onboarding phase influence player experience?". To further explore this topic, we developed two different ways of presenting the onboarding phase of a GWAP: a (1) Text version and an (2) Animated version. Using a qualitative approach, we explore which of the two versions is more engaging. The primary contribution of this paper is providing initial design insight on what promotes player engagement in the onboarding phase of a GWAP and how different presentation formats influence their experience. Our conclusion was drawn from a reflexive thematic analysis based on several theories and frameworks, including instructional design theories (van der Meij, 1995), usability heuristics (Nielsen, 1994), and learning models (Jennett et al., 2016).

2. Related Work

2.1. Games-with-a-Purpose for NLP

Gamifying a GWAP for language labelling is challenging. Unlike GWAPs, where the player is labelling images, it is apparent that a player is labelling text, making the task less engaging (Lafourcade et al., 2015). In order to engage players, different approaches have been taken to gamify GWAPs in this domain (Lafourcade, 2007; Poesio et al., 2013; Fort et al., 2014). For instance, *Phrase Detectives* (Poesio et al., 2013) adopted gamification techniques to motivate players to annotate anaphoric data. Another recent example of a GWAP that implemented a gamification approach is *Wormingo* (Kicikoglu et al., 2019) which incorporated linguistic puzzles to engage players. In an attempt to produce a more game-like experience, *TileAttack* (Madge et al., 2017) applies a similar design to *The ESP Game* (Von Ahn and Dabbish, 2004) but for the aim of labelling text instead of images. Another game that experimented with game-like mechanics is *WordClicker* (Madge et al., 2019). *WordClicker* is a clicker game designed to collect text annotations through incremental game mechanics. To create a more engaging GWAP for NLP, *LingoTowns*¹ was developed, a platform that hosts several mini-games based on *TileAttack*, *WordClicker* and *Wormingo*. This gaming platform is represented as a virtual world and incorporates different design elements to increase player engagement. Findings (Raddick et al., 2009) suggest that GWAP players are interested in both the entertainment and educational aspect of a GWAP. Therefore, *LingoTowns* aim to provide a fun gaming experience while encouraging players to learn about language.

2.2. Player Engagement

Many studies have previously looked at engagement in GWAPs (Tinati et al., 2017; Bowser et al., 2013; Curtis, 2015; Greenhill et al., 2016; Iacovides et al., 2013). To further understand the role of engagement in GWAPs, we must first understand how engagement is experienced. Engagement is dynamic and multifaceted as it can be emotional, cognitive or behavioural (Zyngier, 2008; Bouta and Retalis, 2013; Islas Sedano et al., 2013). For example, in a GWAP, engagement can be experienced by either increasing a player’s enjoyment (Boyle et al., 2016; Segundo Díaz et al., 2022) or by increasing a player’s learnability (Andersen et al., 2012; Miller et al., 2019; Miller and Cooper, 2022). Our study mainly focuses on the emotional and cognitive aspects of engagement.

2.3. Game Design Elements

Game design elements (GDEs) allow GWAPs to become more game-like and therefore engaging. For instance, GDEs provide a game with features that can both enhance a player’s enjoyment and learnability.

Understanding which elements provide players with a better player experience is necessary to design successful GWAPs. Game design models and frameworks have been previously developed to examine the role of GDEs in games. A popular model is the *Mechanics Design Aesthetics* framework (Hunicke et al., 2004), which mainly focuses on gameplay and game mechanics. Nevertheless, Zubek (2020) highlights that many other factors apart from gameplay can influence player experience, such as the visual design of the game. For instance, a recent study (Segundo Díaz et al., 2022) has examined how to design enjoyable and engaging GWAPs by incorporating different game design elements. Several elements backed by *Flow Theory* (Csikszentmihalyi, 1990) were found to increase enjoyment. For instance, both narrative and tutorial were found to contribute to the player’s enjoyment positively and, therefore, were examined. Novak (2015) suggests further exploring the instructional benefits of incorporating a narrative. Additionally, we are focusing on those two elements as they can be used to improve the onboarding phase.

2.4. Modality Effect

The modality in which the GDEs can be presented can influence player engagement. For instance, animations can be used to entertain players and aid in learning (Mayer and Moreno, 2002). Some studies (Palmiter et al., 1991) suggest knowledge retention is improved in text-only tutorials. Nonetheless, animations were found to help users learn faster (Palmiter and Elker-ton, 1993). Modality effect was previously explored in GWAPs (de Leon Pereira et al., 2021; Mildner et al., 2015); however, the studies did not explore the presentation modes of the onboarding phase of a GWAP. Comparing two different presentation formats will help us understand what kind of effect modality has on players of GWAPs during the onboarding phase.

3. Method

3.1. Design

Participants were randomly assigned one of the two conditions; the animated or text version of the onboarding phase. We selected a between-subject study design to avoid the effects of players familiar with one interface over the other, increasing their learning effects.

3.2. LingoTowns

The game used to perform this study is *LingoTowns*, a new linguistic GWAP developed by our research group. *LingoTowns* is a procedurally generated isometric world where each town represents a unique document that needs to be annotated. The gaming platform hosts three mini-games; *PhraseFarm*, which is an updated version of *TileAttack* (Madge et al., 2017), *Lingotoruim*, which is an updated *Wormingo* (Kicikoglu et al., 2019) and *CafeClicker*, previously known as *WordClicker* (Madge et al., 2019). Each

¹<http://lingotowns.com>

of the mini-games is represented by a building found within each town. For instance, the farm represents PhraseFarm, the bakery represents CafeClicker, and the library represents Lingatorium. The three mini-games allow players to annotate parts of speech. The game features a narrative where players are introduced to the context of the game. Initially, the game's presentation of the onboarding phase was designed to be text-based; however, we believe that presenting both the narrative and tutorial as an animation would increase engagement. This led us to design both a text-based version and an animated version of the onboarding phase of LingoTowns.

Description of the Onboarding Phase. The text-based version was inspired by the initial prototype of the LingoTowns' onboarding phase, which focused on introducing the story by text. To examine the effect of modality on both the narrative and tutorial, we designed an animated version of the onboarding.

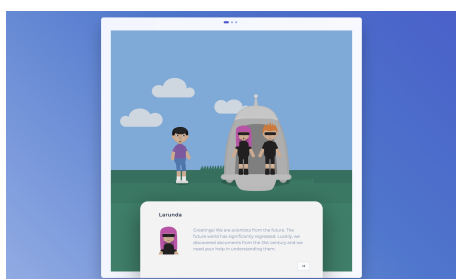


Figure 1: The animated version of the narrative

The design of the animated version of the onboarding (see Figure 1 and 2) follows Mayer and Moreno (2002) multimedia learning principles. Based on the multiple representation principle, it is best to present animation along with text or audio. Therefore the presentation of the animation is provided with the text. The text is displayed on the bottom of the screen, staying close to the animation, supporting the spatial contiguity principle. The animation follows the initial narrative; however, it was edited to be more dialogue-driven to support the personalisation principle. This principle suggests presenting the text in a conversational style.

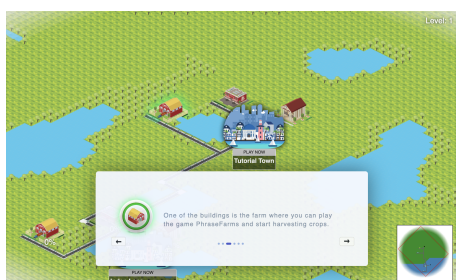


Figure 2: The animated version of the tutorial

The tutorial provided players with simple instructions on the interface to avoid cognitive load, as Hawlitschek and Joeckel (2017) found that detailed instructions in an educational game added extraneous load to the player, decreasing their learning. Hence, we did not include instructions regarding the linguistic aspect of the game in the onboarding phase. Instead, players learn more about linguistic concepts when they start playing the mini-games.

3.3. Participants

A total of 12 (Female= 9, Male= 3) participants were recruited. The mean age of the participants was approximately 30.23, with a standard deviation of 25.62. Participants were recruited from a screener survey of those interested in linguistic and language learning games using a convenience sampling approach. Participants who were interested in taking part in further research were emailed an invitation to the study. This includes 1) Participants who play language games. 2) People who reported that they would be interested in playing a linguistic or language learning game to further scientific knowledge. All participants were fully debriefed after the interview session and received a £30 gift voucher.

3.4. Procedure

In order to identify issues with the design of the experiment, a pilot was performed prior to the study. Following some usability and design fixes, a semi-structured interview was conducted. This was done to explore the users' insights into the presentation design of the onboarding phase in the game. The interviews were conducted from February 22 to March 12 with each interview lasting approximately 15 minutes. Before the study, participants were shown an informed consent where the study and research objectives were stated. The interviews were both screen and audio recorded for further analysis. Once participants were thoroughly introduced to the study, they were then given a link to access one version of the game and asked to complete the tasks. The tasks did not instruct the player to play any of the mini-games to limit any confounding variables as we only focused on LingoTowns onboarding phase and not gameplay. Participants were encouraged to be vocal about their thoughts following a think-aloud protocol (Lewis, 1982). The researcher asked participants follow-up questions after any insight, and participants were encouraged to elaborate. During the interviews, participants were asked about their experience when introduced to LingoTowns. For instance, participants were asked the following questions: "What did you think of the onboarding phase?" or "How did you find the tutorial?". Once all tasks were completed, the researcher asked the participants for final feedback on the game.

4. Analysis

In total 182 ($M= 15$, $SD= 3.47$) minutes of data was collected². Data was first transcribed and then organised by codes into an affinity diagram where themes were generated. The first author performed this analysis to explore the research question, “How do you introduce players to a GWAP and do the different presentation formats of the onboarding phase influence player experience?”. This method was used due to (1) The small sample size of this study due to the niche area of interest and (2) Player experience can be greatly subjective; therefore, examining player experience more closely and understanding a player’s thoughts is more valuable during this early stage. A Reflexive Thematic Analysis (Braun and Clarke, 2021) was the most appropriate analysis method for the aims of this study due to the small sample size present and its flexibility regarding theoretical approaches. Our analysis was theoretically based on instructional design theories (Van Merriënboer and Kirschner, 2017; Huang and Johnson, 2009), heuristics (Nielsen, 1994; van der Meij, 1995) and learning models (Jennett et al., 2016). We acknowledge that our position may have caused unavoidable bias when collecting and analysing data. However, throughout the data collection, participants were encouraged and reminded to voice their honest opinion and be critical of the interface they were presented with.

5. Results

5.1. Less Text, More Visuals

Presenting information entirely by text seems to be unexpected in a game, even to players of linguistic and language learning games. Players expect to be presented with visuals, whether it be an animation, video or graphics. Furthermore, too much text can overwhelm players, which increases the chances of them skipping through the tutorial. Moreover, the combination of both text and visuals in the onboarding phase can increase player engagement. Additionally, audio was expected when players were presented with the animated version of the onboarding. Nevertheless, players who were presented with text did not suggest audio. This is possibly due to them expecting audio to be present when they are viewing an animation or video.

5.1.1. Representing Narratives with Visuals is Expected

Players presented with the narrative as an animation reacted positively to it. However, they were expecting to be presented with visuals to support the narrative. Games typically engage users by introducing a game with animations or graphics. Likewise, players presented with the text version of the narrative suggested presenting the narrative with visuals. Players

who were presented with the animated version found the presentation of the narrative visually appealing. As one player (P5, Animation) commented, “*I thought it looked really good. It looks really professional.*” Moreover, animations are seen as a ‘standard’ way to introduce games:

“I thought [the animation] was kind of cute, which is probably the best way to put it the little people popping up in the little boxes. Also, it’s a very standard way to introduce a game. It looked like [...] a lot of other games, like kind of the pop-ups and stuff. So it was a familiar thing to see. It didn’t surprise me, but I liked it.” (P5, Animation)

While players were satisfied with the animation, they were unsure whether there was sound playing. A participant asked, “*Is there actually a sound [playing] in the background?*” (P3, Animation), And another one (P8, Animation) replied when asked why sound was expected. “*I thought they were moving their mouths. I wasn’t sure if I was supposed to hear somebody.*” P8 then suggested that “*[adding] sound would make it a better experience* “. This could be due to players expecting sound from animations in general, as they are frequently present in games when an animation is playing. Adding audio could motivate players and lead to higher immersion. Game design researchers, Malone and Lepper (1987), found that sensory stimulation is a motivational technique that can be used to increase engagement. Solving this issue could increase the player’s sense of flow because their attention would be focused on the animation. Meanwhile, players who were presented with the text version enjoyed the story’s context but found that visuals were missing. One participant (P4, Text) commented on the narrative “*I like the fact that you came up with a story to motivate people to participate and play the games. I like it.*” Another player found the story and context of the game interesting but felt like it was missing animations:

“I love the setting of it [...] Especially since the whole language has been lost, an entirely new era, it just makes me want to explore it. Now when I think of this, or start to think of little animations, where it might have the future, what it might look like and stuff like that.” (P1, Text)

Having a narrative and context benefits a GWAP and makes it more meaningful to play. Another participant found the context of the story enjoyable; however, the textual presentation could be improved:

“I like the idea of the story. I just think it needs a bit more. And it could even be like a little video intro. You know, kind of take it a step further than pictures. It could be a little story with little people showing you what you need to do well in the game [...] It Doesn’t need to be long. It could literally be, like, 30 seconds or something. But just enough to kind of set the scene, I suppose [...] it’s good to have a story at the begin-

²Please contact the first author for access to full transcripts.

ning. *But then you could use the same kind of theme to do the instructions as well, and that would tie it all in quite nicely together. So if you had maybe the same characters or even just things like the same font, that type of thing, [...], then that would be a good way to bring it all together.”* (P10, Text)

While the context of the narrative is seen as enjoyable, the presentation seems to be lacking visuals. Audio and visual effects can evoke sensory curiosity to heighten the sense of fantasy. This heuristic was proposed by Malone (1982) from a set of guidelines aimed at producing enjoyable user interfaces. Additionally, P10 (Text) recommended using visuals for the tutorial screens and the narrative. This reinforces the findings of Mayer and Moreno (2002), which suggest that multimedia presenting both texts with visuals can promote learning. Additionally, having text presented with visuals seems favourable among other players. As one participant (P1, Text) put it, *“having the text and some animations that would go with [it], would be really really engaging.”* While players are expected to see visuals in the onboarding phase, they might still give the game a try without any visuals being present during the onboarding. One participant expressed that animations may not be essential, and the purpose of this game is the primary motivator to play:

“The animation seems good enough, but since it’s a language game, [...] we’re more focused on that aspect and not going to be looking for [good] animation”. (P8, Animation)

Many players introduced to the text version would still give the game a try despite the onboarding lacking visuals:

“Would I be interested in playing a game like this? Probably, yes. Not because of how it looks; it would be nearly just what it’s about, like reading about that. It’s about lingo, and language is something that interests me. So would I be interested in a game like this? Absolutely. Would I see this game randomly without maybe knowing what it’s about and be interested? Probably not.” (P7, Animation)

This perspective is supported by previous studies (Rad-dick et al., 2009; Causer, 2012; Crowston and Prestopnik, 2013; Iacovides et al., 2013; Curtis, 2015; Eveleigh et al., 2014; Jennett et al., 2016) that state players of GWAPs and citizen science games are motivated to play the game to help science. Moreover, based on the Motivations, Learning and Creativity model (Jennett et al., 2016), one of the initial motivators to play a citizen science game is their interest in science. Another participant said she would try the game despite finding the introduction unappealing. P6 (Text) mentioned that she would play the game due to her being interested in word games. However, she would like a more *“appealing”* interface from the first screen. Despite aesthetics not being the primary moti-

vator for players to play a GWAP, presenting an attractive interface can still boost user engagement (Bui et al., 2020; Wang et al., 2015).

5.1.2. Large Chunks of Text Overwhelms Players

Players who were introduced to the text version of the onboarding found that the initial screens could be improved by adding visuals. In fact, they were taken aback by the text and would skip over information. This may cause future issues to arise in gameplay, as skipping over instructions might result in them missing vital information about the game. *“I am used to seeing more than a couple of sentences in one block of text and just skipping it.”* says P2 (Text). Skipping the instruction could confuse players later on when they need it. One participant (P6, Text) described it as *“boring.”* This could be due to the text version looking unappealing. Splitting text into several slides helped some players reduce their cognitive load. For instance, P4 (Text) found it easy to read the story because it was divided into different slides instead of presenting the text all on one screen. However, despite splitting the text up, some players still found the story too long. P9 (Text) mentioned that because games are played for fun, she does not think anyone will have time to read a long story. Another player (P10, Text) brought up that while the story seems *“complex”* and *“wordy”*, it is not an issue once you get into the game.

When participants were asked how they would improve the introduction, one player (P10, Text) replied, *“Pictures [would improve the onboarding screen]. I would maybe have a few diagrams to break it up a bit. Just so you don’t get lost in the text.”* This suggestion by the player allows us to understand that presenting too much textual information without the use of any graphics can overwhelm players. Likewise, one (P9, Text) player explained why she would prefer seeing visuals presented during the onboarding as it is more *“catchy”*. When asked to explain why she answered:

“When it is a picture, it will just go into the mind rather than when reading [it]. So once they see [the pictures], they will be able to understand and then they will just jump into the game.” (P9, Text)

This notion is supported by the Dual Coding theory (Paivio, 1971), which suggests visuals along with text could help users recall and recognise faster than instructions without visuals. Another participant (P2, Text) suggests adding visuals to assist her in learning in-game tasks:

“[Adding] visuals in with the text helps me kind of like, put together what I will then see in the game with what I’m learning about. I’ll remember more easily what the things are like and what I can do with the certain buildings.” (P2, Text)

To conclude this section, when text is presented along with visuals in the onboarding phase, information retrieval is improved, and players are not required to use

up too much energy processing information. Thus, allowing players to feel engaged when interacting with the game interface.

5.2. Instructions Lack Linguistic Context

In the previous section, we found that players were not interested when large chunks of text were being presented. However, in this section, players needed more guidance and instructions, specifically on linguistic tasks. Players found the instructions of the overall game clear; however, the instructions of the game failed to connect with linguistic tasks found in the mini-games. While the tutorial was understandable and clear, it did not dive into linguistic concepts. Lacking an explanation of those linguistic concepts will negatively impact the player later in the game. When the tutorial lacks sufficient instructions, the player is put under extraneous load. This ultimately leads to the player experiencing frustration. (Miller and Cooper, 2022) study found that most issues were found in the onboarding phase of citizen science games as they failed to explain critical scientific concepts to players. While the onboarding phase in this study did not provide players with linguistic concepts, the players found the general instructions simple enough to follow:

“[The tutorial] was definitely very easy to understand. The text was very simplistic, and easy to read. Wasn’t very long, so it wasn’t overwhelming.” (P7, Animation)

Likewise, P5 (Animation) described the instructions and tutorial as “straightforward” and “clear”. Ensuring that instructions are kept brief is one of the heuristics that (van der Meij, 1995) proposed for designing minimalist instructions. Adopting these principles and heuristics was found to increase engagement in the onboarding phase of an application (Strahm et al., 2018). However, while the instructions are simple and illustrate to the player the main objectives of the game, they fail to give adequate information on the linguistic tasks:

“It doesn’t tell me what I’m going to have to do. It doesn’t even give me a hint [...] It’s not informative. As far as the tasks that I’m going to have to perform in the game, you know, I still have no idea what I’m going to be doing.” (P12, Animation)

Due to the tutorial lacking sufficient instructions, the player is put under extraneous load, causing them to feel frustrated. Thus, reducing engagement and decreasing the players’ learning efficiency (Sweller, 2011). A widely used theory to explain this player’s experience is the Cognitive Load Theory, which has been frequently used in-game research (Huang and Johnson, 2009) to influence the design of instructional information. Similar to Miller and Cooper (2022) study, the instructions presented in the onboarding phase failed to introduce high-level concepts to players. Based on Reigeluth’s elaboration theory (Reigeluth and Stein, 1983), high-level concepts should be presented along-

side sub-concepts to teach instructions effectively.

In the onboarding phase of the game, players were only given information on sub-concepts, such as instructions relating to the gameplay. Like the elaboration theory, Van Merriënboer and Kirschner (2017) proposed the Four-Component Instructional Design model, which highlighted the need to introduce whole tasks rather than solely focusing on smaller tasks. Players need to be introduced to the linguistic tasks of the game to understand the gameplay entirely. Similar to the comments expressed by P12 (Animation), P9 (Text) mentioned the lack of linguistic concepts found in the onboarding phase:

“I’m yet to understand what is the basic concept we are trying to do, actually. I don’t have much idea about what you are trying to do with linguistics.” (P9, Text)

When players cannot understand the tasks that they initially joined the game to do, they look for hints. An example of that is when P4 (Text) looked at the titles of the mini-games to get a hint on what she will be doing. She felt like they did not provide her with any information on the game. When reading the tutorial instruction, she concluded that PhraseFarms is a game relating to the use of phrases. However, the other two games, WordClicker and Lingotorium did not give the player clear information on what to do. The player’s assumption was incorrect; this indicates that she was not presented with sufficient information. Players should be presented with the information they seek to avoid players guessing tasks and experiencing frustrations when those tasks are incorrect.

Lastly, despite most players expecting more information about linguistic concepts to be presented early on, some participants were not concerned with the linguistic context not being explained in the tutorial. Instead, they expect to be presented with more instructions later in the mini-games:

“I think they [instructions] are fine, to be honest, as long as when you get to PhraseFarm or when you get to the cafe clicker or the bakery, it’s clearer on what you need to do at that point, then that’s fine.” (P10, Text)

Similarly, another player explained how remembering instructions that are not needed could be cognitively difficult and unnecessary. Those instructions should instead be presented at an appropriate time:

“It didn’t go into detail as to what those tasks were going to be. But I presume that if you were to go into the building, that it would explain each one in detail, and I don’t think it’s necessary to explain it at the beginning because I just don’t think you would remember [...] remembering the parts that it did talk about is probably enough at that stage of the game.” (P7, Animation)

Gee (2003) suggests introducing game mechanics when the player must utilise them. Context-sensitive tutorials display contextually relevant information to

the user. In contrast, context-insensitive tutorials provide all the information up front regardless of the context. This indicates that a context-sensitive tutorial could be helpful in giving players information when they need it, especially in a GWAP (Andersen et al., 2012).

5.3. Tutorial and Game Interface Requires Refinement

At last, we discovered many usability issues associated with the onboarding phase and the general game interface. A lack of usability can ultimately hinder a state of flow. For this reason, it is crucial to address those usability issues. Overall, the game interface seems easy to navigate but lacks necessary feedback. This includes feedback that can direct and assist the user in completing the tutorial and feedback that helps the player avoid mistakes. Another issue that many players have commented on is related to the graphics found in the game, which include the icons representing the mini-games. In GWAPs, UI and technical issues are commonly found, hindering player learnability (Miller and Cooper, 2022). Therefore it is vital to identify those issues and find the appropriate design solutions.

5.3.1. Tutorial Feedback is Unsupportive

Feedback is an essential component used to promote the usability of user interfaces; it is commonly featured in usability heuristics (Nielsen, 1994; Shneiderman et al., 2016). However, the wrong kind of feedback can negatively affect a user's experience. For instance, visual cues help players navigate through the game. Presenting visual cues such as icons, labels, and buttons on the map calls the player to action guiding players on what to do. When a player understands the system's current state, the gulf of execution is small (Norman, 1986). An example of this is when a player is presented with a design that supports the heuristic visibility of system status (Nielsen, 1994). Visual cues need to accurately represent the goal as they can signal to the players that an action is available for them to take:

"I like the fact that it highlights the buildings when you hover over it, so it recognises that and you know, it's very clear that there was an action there. There's something for me to do" (P10, Text)

This suggests that giving the user a visual cue assists in directing the players to the correct actions. However, visual cues can be misused and affect the game's usability. An example of this is when P11 (Animation) clicked on the town icon and expected the town icon to disappear. The interface gives a call to action to the wrong action causing the player to feel confused:

"I would have expected that like this play now tutorial town would have changed or gone away or because at first I was like, Wait, did it work when I clicked on it? You know? But now I'm seeing that since these are lighting up that it seems like there are now more options available to me." (P11, Animation)

Another player P10 (Text), thought the icons presenting the tutorial town should not be visible before completing the tutorial. Instead, the icons should appear when the player is ready to begin the game. Designers must be cautious when presenting them as presenting the incorrect visual cues can result in a player making a mistake. P5 (Animation) finds it confusing that some buildings are being highlighted when hovered over despite her not finishing the tutorial. She further explains, *"it looks like you can immediately go to them"*. Additionally, if a wrong action is made, the corrective feedback is lacking:

"I found it odd that when I clicked on the wrong thing, [the map] just zoomed out, and it didn't highlight or indicate the bakery or anything [...] So if it goes wrong, maybe some indicators like nudge [you] towards where you need to be?" (P5, Animation)

When a user executes a wrong action, the system must provide adequate feedback. This is supported by the 'Help users recognise, diagnose, and recover from errors' heuristic proposed by (Nielsen, 1994). Moreover, providing feedback promotes learnability. According to an instructional design model (Van Merriënboer and Kester, 2014), feedback correcting wrong actions is essential to achieving learning.

5.3.2. Graphics are Unclear

The game's aesthetics is very subjective, as some players prefer one style over the other. For instance, one participant (P10, Text) liked the simpler graphics, *"I liked the graphics. I like the fact they're not overly complex"*. While others expected more game assets to be present, P7 (Animation) suggested improving the trees, grass, and adding *"little features, just to make it a little bit more appealing to the eye."* Similarly, P9 (Text) expected to see more features, such as buildings, present on the map. Taking it a step further, P1 (Text) suggested adding animations on the map to make it lively:

"So it'd be the sort of thing where I'd want to like zoom in and out and try to see what was happening or maybe some small animations of people running between buildings [...] even if it's just repeated [animations] of people going from building to building carrying things" (P1, Text)

Improving the aesthetics of a game has been shown to enhance engagement in GWAPs (Wang et al., 2015; Bui et al., 2020). However, our primary focus is on the usability of the game, thus, we need to ensure the players can easily navigate around the game's interface. P7 (Animation) mentioned that the game map is clear and easy to navigate:

"In terms of just the general layout, it's very simple. It's very easy to navigate. I think somebody of any age could easily figure out this game. So I think it's pretty obvious. There's not also much else going on on the screen. It's a very, like, clean screen minus the town icon. So I would have no problem [navigating]." (P7,

Animation)

Despite P7 (Animation) finding the game easy to figure out when she first was introduced to the map, she later mentioned that the some buildings are easier to distinguish than others:

“The bakery is the least obvious one. I would have had to look to the farm and the library first to realise that that was the bakery. Because yeah, now that I see it, I see like a little bakery written on it. Because I remembered the three buildings [in the tutorial], I was able to realise like, okay, that must be the bakery. But the farm and the library are more obvious to recognise.” (P7, Animation)

In the quote above, P7 (Animation) refers to the tutorial where each building was presented visually. Even though she found the bakery the least obvious of the three, she thought it was easy to find which building was because she recognised them from the tutorial. This indicates a benefit to presenting visuals in the tutorial as they help players recognise objects found on the map. However, providing more explicit labels of the icons on the map can still be necessary for those who experienced the animated onboarding phase. For example, P12 (Animation) adds that players could face difficulties remembering and distinguishing buildings in the game:

“I’m not sure that people who play the game will remember which is which, in the end. I mean, the icons are similar enough [...] they’re not very distinguishable. Right. So like, I know, the one at the bottom left is the farm and the one. Above the tutorial town is the bakery. I know that but I may very well forget it [...] the work that I’m doing could interfere with my playing the game. I mean, there’s already like, there’s a lot of executive tasks involved.” (P12, Animation)

The ‘executive tasks’ that P12 (Animation) mentioned could refer to the tasks related to executive functions, such as using one’s working memory. This is not ideal in a game as it can lead to extraneous cognitive load. Another player, P1 (Text), mentioned that he was “struggling” to figure out which of the buildings, further supporting previous comments that the buildings are hard to distinguish. A solution to this is to follow Nielsen (1994) ‘Recognise instead of recall’ principle to minimise the memory load on the player. According to Dual Coding theory, presenting both text and visuals to a player will allow players to retrieve information quicker (Paivio, 1971). For example, this can be done by adding labels to the icons found on the map. The issue with the building icons was primarily present with the ‘bakery’ building when compared to the other buildings:

“hard to see the word bakery on the building, ah, hard to recognise the bakery, the farm in the library stood out, but I just knew Bakery was supposed to be there and then I couldn’t see the word bakery.” (P8, Anima-

tion).

Despite P8 (Animation) being introduced to the game through the animated onboarding phase, it was still difficult for her to recall the bakery building because the label was unclear. P4 (Text) also found that the bakery label was unreadable. Furthermore, some players recommended making changes to solve the issue found in the ‘bakery’ building. For instance, P9 (Text) recommended making the bakery building more obvious because she found that it is difficult to distinguish the different buildings. Another design suggestion made by a player is to separate the label from the building. P4 (Text) suggested that instead of having the titles of the game directly on the building, it can instead be “*be written separately like bigger and more in a clearer way in order to easily find [the building]*”. Similar to P4 (text), P11 suggested adding labels to the building icons:

“It might be helpful if like a name for these would pop up I mean, like I can see that’s a barn, this does say bakery but something like this you know like little text underneath would help me understand like what each of and also remind me because I know like in that little introduction blurb it said like you can play such and such mini-game in this place and this game in that place. Having those reminders here might be helpful like when I mouse over each one” (P11, Animation)

Based on the players’ design recommendations, players would prefer recognising instead of recalling icons regardless of which presentation of the onboarding phase they were presented with. Finally, applying the design recommendations suggested by players could refine and improve the onboarding phase of the game.

6. Conclusion and Future Work

Based on our findings, most of the players presented with the text version wanted animations or visuals, while some players who were presented with the animation found it was ‘standard’ to be presented with an animation in the introduction of the game but missing sound. Despite that, players who viewed the animation gave positive feedback on the animation. Participants who were presented with the text version found the text overwhelming and dull, lacking visuals. The narrative interested both groups, and the instructions were clear in both versions. However, despite the instructions being clear, some participants would skip over large chunks of text or fail to remember some information. Unfortunately, the onboarding phase lacked linguistic context making it difficult for players to understand their purpose for playing the game. Additionally, the usability issues found in the tutorial and game interface hindered player engagement. We conclude that while the presentation format of the onboarding phase does affect player engagement, other aspects of the onboarding phase can play a role in player engagement and should be further explored.

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