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**Player Engagement with Idle Games: A Mixed-Methods Exploration with
Design Implications**

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Abstract

Daeun Hwang

Exploring Engagement in Idle Game Design

Idle games are a relatively recent type or genre of game, characterized by minimal player interaction. Due to their less interactive nature, there has been a research gap in the understanding of player engagement within idle games. This thesis presents preliminary research examining the engaging aspects of idle game design through two studies: 1) a semi-structured group interview with idle game players, and 2) a 2 x 2 (idle game vs. casual game x PC vs. mobile) experimental diary study. Findings revealed that idle games are as engaging as casual games since there was no statistically significant difference in engagement and gameplay time. Key characteristics of favored idle games are also outlined, highlighting notable gameplay patterns within idle games and exploring players' motivation. Overall, this thesis provides game designers and researchers with a more nuanced understanding of idle games, their relationship to casual games, and how they can be designed for more effective engagement across PC and mobile devices.

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Chapter 1

Introduction

1.1 Background and Motivation

Lately, digital games have been consistently growing in the market over the years [1]. More devices are being integrated, new games are being released, and their categories are expanding. Among the new types of games being introduced, the idle game is a relatively recent addition. Idle games are defined by their characteristics of being relatively less complex in general and consisting of simple actions such as clicking or tapping to collect resources or achieve a goal [2]. In the case of resource accumulation, these resources serve as in-game currency or points, enabling the acquisition of new items or automatic resource generators.

Some idle games allow an unlimited number of repetitive actions, while others require a certain waiting time before users can take additional actions. For instance, players can idle endlessly, tapping on the screen to get more resources, while some games do have constraints on the time interval that players can take actions. Notably, due to their characteristics, users do not spend much time interacting with

idle games directly. Idle games are distinctively characterized by their limited interactivity with players, although interactivity is widely recognized as a fundamental element in engaging users in gameplay. In fact, one study suggests that a less interactive game may potentially diminish players' enjoyment [3].

1.2 Research Gap

In the realm of academic research, game studies place considerable emphasis on user engagement, which is a central factor in attracting and retaining players [4, 5, 6, 7]. Since most investigations of player engagement focus on active player involvement, idle games featuring minimal interaction may be perceived as contradicting conventional notions of what constitutes engagement in gameplay. This may serve as a key explanation for the limited academic attention given to engagement in idle games.

Previous studies claim that studying engagement of idle games could expand understanding in design implications for engaging technologies [8, 9]. Few papers have explored user engagement in idle games, with most focusing on individual games rather than idle games in general. This highlights a significant gap in the literature regarding how idle games engage users. Whether idle games are as engaging as other types of games remains uncertain; therefore, this thesis aims to examine how idle games manage to engage users despite their less interactive nature.

1.3 Research Questions

This thesis focuses on analyzing engagement and overall experience with idle games. The main research questions are the following:

RQ1: Do players feel engaged with idle games, and if so, what are the key factors of idle games that contribute to engagement?

RQ2: How does player engagement with idle games differ from engagement with casual games?

RQ3: How do players describe their gameplay experiences with idle games?

1.4 Contributions

By examining whether and how idle games are engaging, this thesis investigates how players perceive and reflect on their experiences, as well as presents a comparative study that explores what makes the player experience with idle games unique compared to casual games that also share simple design. This work offers in-depth insights into understanding engagement in idle games. These insights further contribute to a broader understanding of engagement with games in general, raising questions about which specific design elements attract and engage players.

This work presents results and analysis from a semi-structured group interview with idle game players, as well as an experimental diary study that compared players' engagement and reactions to casual and idle games over time. Using thematic analysis [10] alongside statistical analysis, it identifies notable patterns in player behavior with idle games and offers design implications for creating more engaging idle game experiences.

Furthermore, the five key characteristics of favored idle games offer design implications that developers and designers may consider when creating more engaging experiences. As idle games are increasingly applied to serious purposes beyond entertainment, these insights may also help support engagement in broader technological applications.

Chapter 1. *Introduction*

This thesis builds upon a previously published IEEE Conference on Games (IEEE CoG) 2024 paper, which introduced findings from the group interview and diary study. While that paper provided initial insights into player engagement with idle games, this thesis expands on that work by offering clearer explanations, additional supporting literature, and more detailed discussions.

Chapter 2

Literature Review

2.1 Engagement in Game Research

Engagement has been a critical factor in the study of media. In the context of games, it is often discussed in conjunction with the concept of motivation, which draws users to play the game [11]. Most existing concepts of engagement are rooted in studies of media in general, rather than games specifically [5].

Fredricks et al. identified three primary constructs of engagement: a) cognitive engagement, b) emotional engagement, and c) behavioural engagement [12]. However, Khan et al. have noted that cognitive engagement is complex to observe, as it involves internal processes [13]. In the realm of game studies, cognitive engagement has been examined through questionnaires with scales [14]. The Game Engagement Questionnaire (GEQ) [7] is one of the common measurement tools in game studies that assesses player engagement, and will be used in this thesis to examine engagement with idle games. GEQ has been thoroughly verified by a previous study [15] and has been used actively in game research. While some research has suggested

that digital games may intrinsically engage players, it remains a question whether all games, irrespective of their design and genres, are inherently engaging [4, 16].

Although the definition of engagement may vary among studies, it generally encompasses the concept of involvement with a medium based on factors such as immersion, presence, flow, psychological absorption, and dissociation [7, 17, 18, 19].

2.2 Type of Video Games

2.2.1 Categorization of video games

The development and expansion of video games has led to the diversification of video game categorizations. Market-based genres are designed to align with users' preferences and needs [20]. However, prior research has claimed that precisely classifying games into specific genres or categories is challenging due to their diverse nature [21, 22, 23]. Most existing studies consider game genres to be classified based on player interaction [24].

Although the terms 'type' and 'genre' are often used interchangeably, Grace defines 'type' as a means of describing gameplay action and 'genre' as a means of conveying a game's narrative content [25]. On the other hand, game genres can also be constructed by considering both gameplay and narrative elements [26]. Current categorizations of game genres or types usually involve a blended or mixed employment of components, and it is also true that genre perception evolves with technological advances, accompanied by the continuous emergence of new ones such as idle games [27].

2.2.2 Casual games and idle games

Since idle games being defined as idle games is not because of its narrative aspects but because of its characteristics in gameplay actions, this thesis will define idle games as a type of game rather than a genre. Specifically, Keogh and Richardson mention that idle games can be viewed as a subset of casual games since they can be played for relatively short periods and offer flexibility [28]. Idle games and casual games share similar characteristics, such as their operation based on simple logic and the ability for players to engage casually for a desired duration, but they still exhibit distinct differences [8].

One of the key differences between idle and casual games lies in player interaction. Idle games embrace the system of player waiting for a certain period of time as a core gameplay element, where progress often occurs without the need for constant player input. In contrast, casual games frequently implement time-based challenges, such as limited-time levels or fast-paced time attacks, which require players to engage actively within short bursts of play [29]. As a result, a casual game would seem to involve more frequent and direct player interaction during the same amount of playtime compared to an idle game. While casual games often encourage reactive or skill-based interaction, idle games tend to promote a more passive or ambient form of gameplay.

Spiel et al. also note that idle games have a more ambiguous player population compared to casual games, which tend to have a more distinctly defined audience [8]. This suggests that idle games may support a broader range of players. Despite these differences, both genres share features such as simple mechanics and low barriers to entry, making them useful points of comparison in understanding how interaction patterns relate to perceived engagement. Therefore, this thesis aims to

investigate any differences in gameplay experiences between idle games and casual games.

2.3 Idle Games

2.3.1 Characteristics of idle games

Idle games emerged in the early 2000s, with one of the early examples being Cow Clicker by Bogost in 2010 [30]. It was initially developed as a means of critiquing social games that presented no significant challenges for players, and even the developer did not anticipate its widespread popularity. Idle games possess distinct and unique characteristics compared to other types of games, i.e., they require periods of waiting [28], often involve repetitive actions [3], exhibit technical endlessness [31], and offer limited interactivity [32]. Several studies have attempted to define idle games and their characteristics through taxonomy [2], player action [30], and designers' perspectives [8]. A few other studies have focused on analyzing their unique characteristics [3, 33].

One common characteristic of idle games that previous studies have consistently acknowledged is minimal interaction, and there exists a spectrum of interaction within idle games, ranging from frequent interaction to virtually none [34]. Highlighting the absence of active player involvement, such games are also referred to as zero-player games [33].

Previous studies have referred to idle games as various other names. Earlier papers refer it as ambient games [35]; players leave the game to run by itself and barely intervene. After the player starts the game, gameplay actions run automatically. Therefore, the very core decision made by the player is simply starting the game.

Eyles and Eglin define two techniques for implementing ambient games: a game system that is carried by the player and interacts with real-life surroundings, and a non-intrusive gameplay system embedded within the environment. It is basically set and run in player's ambient [28]. Similarly, it is called background games as well since it can be left untouched in the background and embedded in the player's lifestyle [28]. Highlighting how idle games can run on their own, they are also referred to as automatic games [36].

Some scholars focus more on the game system itself, such as resource accumulation, referring to it as an incremental game [31]. This accumulated resource is often in the form of currency or points that directly contribute to the player's score. Commonly, idle games are also referred to as clicker games [37], as incremental collection in idle games typically involves players' repetitive clicking actions.

2.3.2 Existing applications of idle games

There have also been a few attempts to incorporate idle games into uses beyond entertainment, such as enhancing exergames for behavioral change, due to their simple nature, which can easily involve entertainment through gamification. A previous study that focused on interpassivity in idle games highlights that the advantage of idle games relies heavily on their behavioral model of reduced laborious tasks and attention required, while offering easily gained rewards that follow a compulsive pattern [36].

Under such characteristic behavioral patterns, idle game mechanics are often integrated into exergames aiming for behavioral change, as their structure leads to a loop of active and inactive play phases [38]. This cycle aims to increase player retention by using active participation, followed by an inactive phase that leads to rewards. Similarly, Liang et al. have utilized this pattern of mandatory player inactivity in

Chapter 2. *Literature Review*

game design to improve sleep hygiene [39]. Actively integrating this benefit of idle games, they implemented passive elements that lead to positive reinforcement.

Taking note of their simplicity and availability for frequent play, idle game mechanics have also been used in breathing exercises [40, 41]. The fact that idle games involve repeated play sessions and encourage players to return could be useful for applications that require multiple practices in a routinal cycle. Overall, idle games have been found to contribute to relaxation due to their low-stress and low-effort play patterns [42]. These cases show the potential of idle games to serve as effective frameworks for supporting player engagement in everyday well-being practices.

Chapter 3

Study 1: Semi-Structured Group Interview

3.1 Study Overview

To have a thorough understanding of player experience with idle games and guide what to examine in a future experimental study, it was necessary to hear from actual players. To further explore their engagement with idle games, a semi-structured group interview was conducted to hear about their experiences and motives for playing idle games. Specifically, the goal was to discover the core elements of idle games that individuals find enjoyable, to identify factors that engage players. By conducting it in a group setting, I aimed to observe potential consensus in perception towards idle games, despite the possibilities of variation in personal preferences.

This study mainly addresses RQ1 and RQ3 by examining whether players feel engaged with idle games and how they describe their overall gameplay experiences.

3.2 Participants

Targeted participants were those who had previously played an idle game for more than two weeks, as this was reported as the average duration for playing well-known idle games in a previous study [40]. Recruitment was done through Discord and Slack channels of university students while participation was open to anyone who meets this gameplay criteria and is willing to share their experience with idle games. Five participants with mean age 22.4 (SD=1.14) were recruited, with two participants self-identifying as female and three as male.

3.3 Methods

A semi-structured group interview with idle game enthusiasts was conducted via Zoom virtual call, with the theme around their general experiences with idle games. The session started with a researcher explaining the theme and establishing ground rules, emphasizing the importance of respecting each other's opinions. Each participant was initially asked to articulate their experience with the idle games. Participants were encouraged to freely exchange comments during discussion. Several open-ended questions were introduced, including: What is your favorite idle game?; Why do you think people play idle games?; How would you rate the game you play? Researchers intervened only when facilitation was necessary, such as asking follow-up questions, and took notes throughout the discussion.

3.4 Thematic Analysis

With participants' consent, the interview was recorded and then transcribed. Using thematic analysis [9], two researchers first familiarized with the data by reviewing

the transcription multiple times. Subsequently, one researcher assigned initial codes to key phrases and words using an inductive approach, which were then reviewed by another researcher. We used the Design, Dynamics, Experience (DDE) framework for the design of computer and video games proposed by Walk et al. [10] to organize these codes in the context of how they were related to the game design and player experience. We also labeled each code as ‘positive’, ‘negative’, ‘both (positive and negative)’, and ‘neutral.’ Each categorization and code was reviewed by two researchers and refined multiple times until the research team agreed that they sufficiently covered the data. Each code, grouping, and affective label derived from the data is shown in Table 1.

TABLE 1: Codes from Semi-Structured Group Interview

Group	Code	Label
Design	Accessibility	Positive
	Collection	Positive
	Continuity	Positive
	Tasks	Neutral
	Exponential Growth	Positive
	Graphics	Positive
	New features	Positive
	Penalty	Both
	Being played while away	Positive
Dynamics	Progression	Positive
	Social	Positive
	Stimuli	Both
Experience	Lack of attachment	Negative
	Lightness	Positive
	Obsession	Negative
	Time waste	Negative

Chapter 3. *Study 1: Semi-Structured Group Interview*

These codes from Study 1 were later revisited to draw insights alongside Study 2, as discussed in Chapters 5 and 6. In addition, initial findings from Study 1 played a key role in shaping the design of Study 2, particularly by informing the selection of games that reflected features commonly identified by participants and researchers as core to idle game experiences.

Chapter 4

Study 2: Experimental Diary Study

4.1 Study Overview

After developing a general understanding of players' perspectives towards idle games, I aimed to further examine engagement of idle games more closely and discover any notable patterns in gameplay experiences. To assess the engagement of idle games, I conducted a 2 x 2 factorial experimental diary study. Existing engagement metrics do not necessarily provide specific criteria, such as a minimum score, to definitely determine a game's engagement level; instead, they serve as guiding tools. Therefore, comparing the experience with idle games with that of other types of games would demonstrate whether, despite their limited interactive characteristics, idle games are as engaging as other types of games. I chose to compare idle games with casual games since idle games have been defined as a subset of casual games, exhibiting similar traits while also demonstrating distinct characteristics [26]. Furthermore, previous studies on engagement of idle games have primarily focused on individual games or platforms. Accordingly, I included both PC and mobile

platforms to investigate whether the device used to play the games would impact players' engagement and experience.

This study primarily tackles RQ1 and RQ2 by investigating whether players actually feel engaged with idle games, and how that engagement compares to casual games across different devices.

4.2 Participants

The recruitment forms were distributed in Discord Gaming channels and relevant online forums. These forms included general information about the study, consent, demographic information, and gaming experience. They served the dual purpose of confirming that all participants are over the age of 18 and willingly participating in the study. Additionally, participants assessed whether they had any concerns regarding the study or encountered any difficulties playing PC or mobile games to ensure their eligibility. Once participants submitted the form to participate, researchers reviewed participants' responses to ensure eligibility and provided further study details. A total of 56 participants were recruited, with 40 participants completing the full study. Participants had a mean age of 23.13 ($SD=2$), with 30% self-identifying as female and the rest self-identifying as male.

4.3 Methods

This study employed a single-blind 2 x 2 factorial design: PC and mobile, and idle game and casual game. After participant recruitment, individuals were randomly assigned to one of the four test groups, with each group comprising 12 to 15 participants. I also ensured to balance the hours of usual gameplay and gender ratio

across groups. Following assignment, participants received instruction outlining their designated game, access to the online daily questionnaires, and comprehensive overview of the study. Participants were given a period of 10-day time frame to complete the study, by playing the assigned game on three days of their choice, and complete the questionnaire. While participants were encouraged to play the game for a minimum of 3 minutes on the designated platform, no restrictions were given on the frequency and duration of gameplay sessions. Researchers sent reminders every 2 to 3 days, based on their participation.

4.4 Game Selection

The selection process for the games to be tested was performed with several criteria: I first revisited the definitions of idle games and casual games from previous studies. For casual games, a key characteristic was its simplicity compared to other types of games with more complex mechanics and design [43, 44, 45]. For idle games, key attributes included waiting time, repetitive actions, endlessness, and limited interactivity as previously mentioned above [2, 3, 26, 30]. However, existing PC idle games did not consistently incorporate all characteristics of idle games under the traditional taxonomy [2]. Therefore, this thesis referred to the four key elements of widely played idle games established through consensus among participants and researchers in S1: (1) continuous progression, (2) running in the background, (3) being played on its own, and (4) new features getting unlocked or earned that are visibly applied. Among these, ‘being played on its own’ was noted as the most crucial element and was thus considered the primary selection criterion.

Given that prior studies predominantly focused only on individual games or specific platforms, a comprehensive approach was adopted, examining both PC and mobile-based games. For PC games, I searched through popular online gaming platforms

that offered free games with clear categorizations of “casual” and “idle” games. Within these platforms, I sorted the games by popularity, and then conducted trial plays to ensure fully functioning gameplay and confirm that no additional downloads or extensions were required. a similar procedure was followed for mobile games, leveraging through the list of popular idle and casual games featured on the App Store. Within this compilation, I sought for the free casual and idle games with the most number of reviews and top rating, since download metrics were not accessible. Upon organizing a list of available games, I aligned the graphical aesthetic of all four games (casual PC, casual mobile, idle PC and idle mobile), which turned out to be bright vibrant color-themed games with outdoor backgrounds. Through these procedures, the final selection of games consisted of: Egg Inc. for idle mobile [G1], Subway Surfer for casual mobile [G2], Farming Business for idle PC [G3], and Stacky Bird for casual PC [G4] (Fig. 1).

4.5 Questionnaire Development

To measure player engagement with idle and casual games across different devices, I developed a questionnaire for the diary study. The daily questionnaire included two sections: the Game Engagement Questionnaire (GEQ) and an open-ended comments section, where participants described their gameplay experience overall and what aspects of the game they particularly liked or disliked.

On the questionnaire for the last day (Day 3), participants had to answer two additional questions with a 7-point Likert scale to rate the game and indicate their likelihood of continuing to play the assigned game after the study was completed. The overall impression was measured by calculating the average of these two questions.

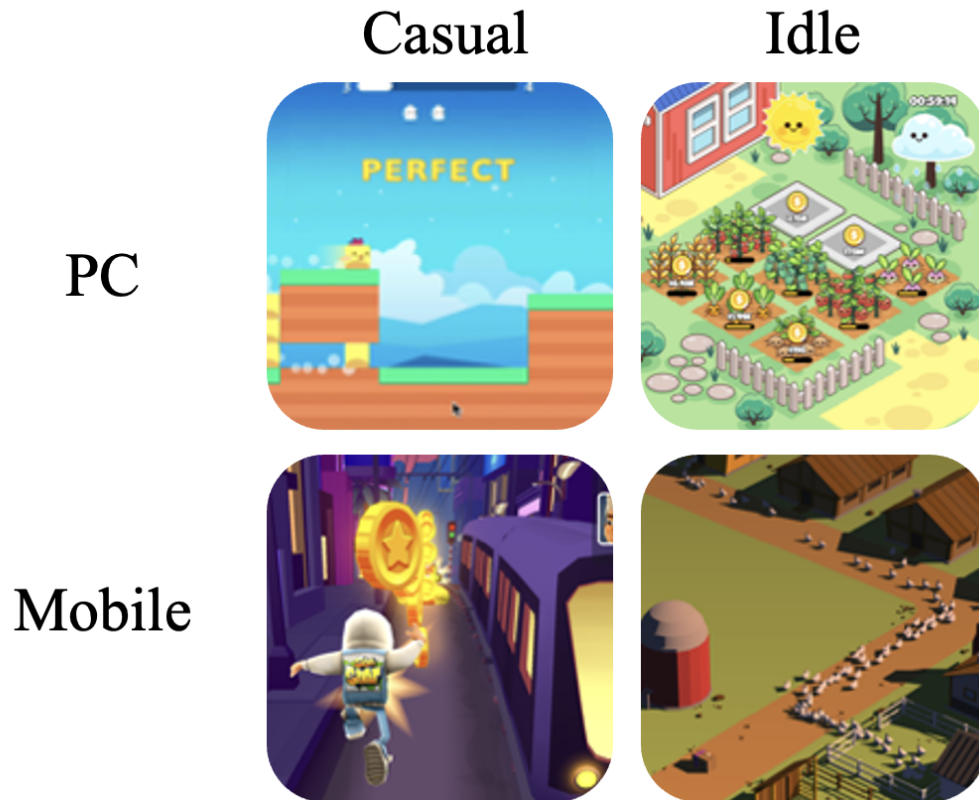


FIGURE 1: Gameplay snapshots of the selected games

4.6 Statistical Analysis

4.6.1 Engagement and gameplay time over days

IBM SPSS Statistics was used in order to analyze statistical significance. Regarding overall changes on engagement and gameplay time, there was no statistical significance ($p > 0.05$). However, a noticeable pattern was observed when the average score of each group was visualized on a line graph (Fig. 2).

In terms of engagement measured through GEQ, all four groups of games showed a decrease from the second day. Only the mobile casual game group showed higher engagement scores on the third day. For the idle mobile game group, they started with 39.1 on the first day and had a marginal decrease to 39 on the last day.

Chapter 4. Study 2: Experimental Diary Study

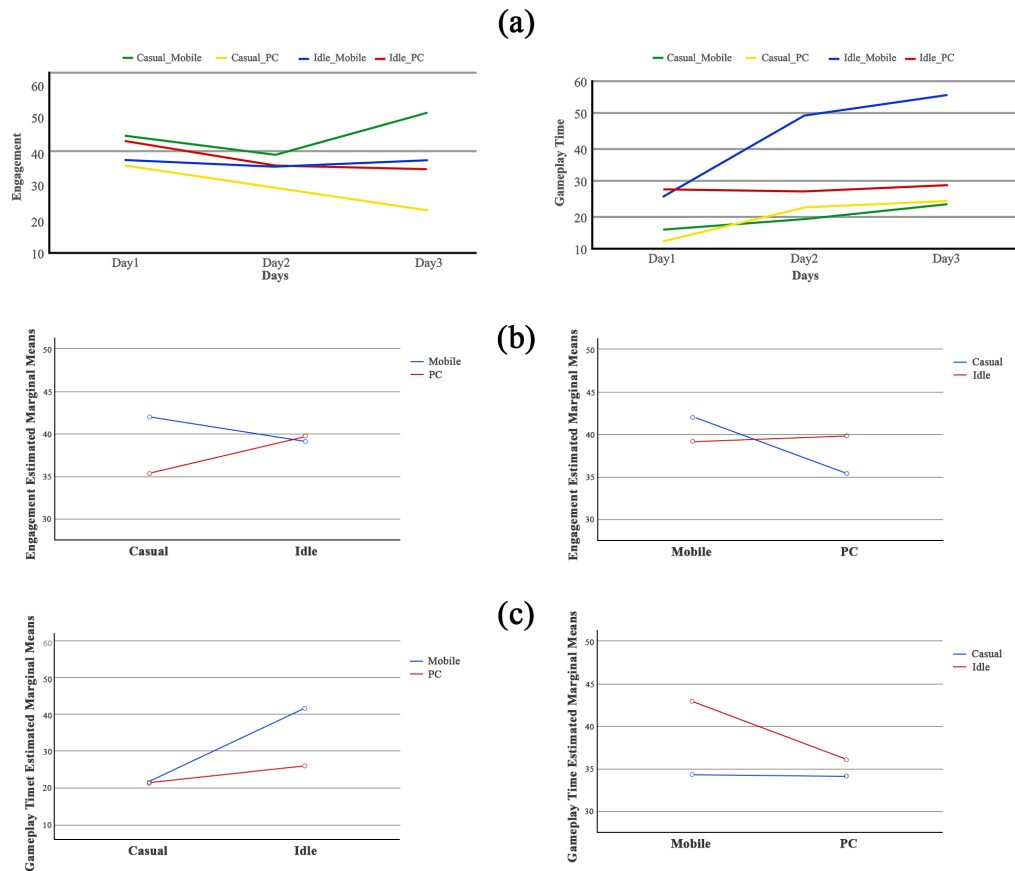


FIGURE 2: (a) Graph showing game type x engagement (left) and graph showing game type x gameplay time (right) over 3 days;
 (b) Interaction effects on engagement;
 (c) Interaction effects on gameplay time

For gameplay time over days, all four groups of games indicated an increase compared to the first day. Notably, the idle mobile game group displayed the longest gameplay time overall, along with the most substantial increase in duration. In contrast, the mobile casual game group recorded the lowest gameplay time overall, while the PC idle game group demonstrated the smallest increase in gameplay time.

4.6.2 Factorial analysis on engagement and gameplay time

A factorial ANCOVA was used to determine significance between dependent variables (engagement and gameplay time) and independent variables (game type and device), controlling for effects induced by other variables. Participants' prior data on normal game frequency, normal gameplay duration per session, and total game experience in years were controlled as covariates.

TABLE 2: Statistical Significance of Each Group

	Day 1	Day 2	Day 3
Casual vs. Idle	Gameplay Time	Gameplay Time	
	p=0.021 (<0.05)	p=0.031 (<0.05)	None
	Casual < Idle	Casual < Idle	
Mobile vs. PC			Overall rating
	None	None	p=0.049 (<0.05)
			Mobile > PC

As shown on Table 2, there was no statistically significant difference in engagement observed across games and devices over a three-day period. Meanwhile, there were some significant differences noted in gameplay time, which reflects the duration participants spend on the assigned game before completing the questionnaire each day. For the first and second day, participants who were assigned to idle games spent significantly more time than those with casual games ($p=0.021$ and $p=0.031$). Nevertheless, no significant difference was detected on day 2 and 3. For the difference of devices, there was no significant difference except for on the final day, when participants were asked to give overall rating to the game they were assigned. Participants who were assigned with mobile games gave a higher score relative to those with PC games ($p=0.049$).

4.6.3 Repeated measures analysis on engagement and gameplay time

Using repeated measures ANOVA, I further examined interaction effects of different types of games and devices on engagement and gameplay time over the course of three days. This was analyzed and visualized through graphs shown in Fig. 2b and Fig. 2c. For engagement illustrated on Fig. 2b, there is a lower engagement for the PC game group compared to the mobile group, when playing casual game over time. There is also a noticeable difference in slopes which indicates a relatively small difference in engagement for participants who played idle games between mobile and PC compared to casual games. This suggests a potential two-way interaction effect for the interaction of devices with casual games. The divergence of lines on PC and casual game further suggest a potentially stronger two-way interaction effect for the interaction of game type with PC, and interaction of device with casual games.

In contrast to engagement, a greater gameplay time was observed for the mobile game group compared to the PC group when playing idle game. For casual game, no major difference was observed. The steeper slope of the mobile group also signifies that the difference in gameplay time for participants who played on mobile device was relatively greater between casual and idle games. Regarding game type, idle game players displayed a relatively larger difference in gameplay time for different devices than the casual game players. As the lines converge on PC and casual games, this suggests a potentially stronger two-way interaction effect for the interaction of game type with PC and interaction of device with casual games. This pattern aligns with the comparison of interaction effect for engagement, since both seem to have patterns of interaction effect being greater with PC and with casual games.

4.7 Thematic Analysis

Employing the same procedure for thematic analysis in Study 1 (S1), the open-ended questions from the questionnaires were analyzed. These open-ended questions included their impression towards the game on each day (Day 1, 2, and 3), along with additional questions presented on the final day which were participants' rationales on the overall score they rated the game, their likelihood of playing the game again and rationale behind, what made this game engaging or not engaging, and a supplementary comment section.

TABLE 3: Codes from Survey Comments

Group	Code	Label
Design	Automatic play	Neutral
	Continuity	Positive
	Difficulty over time	Positive
	Ending	Neutral
	Instruction	Both
	Interaction	Negative
	New features	Positive
	Repetitive	Negative
	Reward	Positive
	Simplicity	Both
Dynamics	Storyline	Negative
	Visual feedback	Positive
Motivation	Achievement	Positive
	Challenge	Positive
	Motivation	Both
	Progression	Positive
	Goal	Positive
	Stimuli	Both
Experience	Lack of attachment	Negative
	Boring	Negative
	Not rewarding	Negative
	Frustration	Negative
	Immersion	Positive
	Killing time	Positive
	Lightness	Positive
	Mindless	Neutral
	Relaxation	Positive
	Satisfaction	Positive

Chapter 5

Discussion

This chapter presents key insights drawn from the analysis of two studies: Study 1 (S1), a semi-structured group interview, and Study 2 (S2), an experimental diary study. It addresses the research questions introduced in Chapter 1, with a focus on how players engage with idle games. The integration of findings from both studies provides a more comprehensive understanding of player engagement by combining in-depth perspectives and exploratory reflections from S1 with broader behavioral patterns and systematic observations from S2. Quotes from participants are labeled with S1 or S2 to indicate the study in which each quote was mentioned.

5.1 Idle games being as engaging as casual games

The analysis on S2 revealed no statistically significant difference between engagement with idle games versus casual games. While idle games feature relatively simpler and repetitive interactions compared to casual games, idle games being a subset of casual games suggest that game mechanics for both types of games are inherently simple. Furthermore, idle games could actually be engaging with its unique

appealing factors such as the key criteria outlined in Chapter 6. Therefore, perceptions of idle games as lacking in engagement may be due to poor design approaches and the absence of major strengths rather than inherent limitations of idle games.

5.2 Inducing both positive and negative reactions

While this thesis addresses engagement and positive experiences with idle games, certain elements received both positive and negative perceptions. For these aspects, careful attention to balance appears crucial to maintaining player engagement in idle games:

5.2.1 Penalties

Although most idle games allow players to remain idle without repercussions, there are a few games that do have penalties. Participants expressed a preference for games without penalties since they get to enjoy its idle nature and sense of relaxation; however, they also recognized that the absence of penalties led to reduced attachment to the game. Therefore, implementing lightweight penalties that do not heavily affect the core gameplay mechanisms would effectively keep players engaged while reducing unnecessary tension.

“This one is actually my favorite because there aren’t really any penalties I guess, if you forget about them (S1, P1)

P1 introduced her favorite idle game where she can simply tap the frog after certain interval of time, to send out for an adventure and collect various items. Since she favored how it did not have any penalties, it seems that preference towards sense

of ease align with no penalties. However, participants addressed different point of view on the same aspect:

I guess... idle games, they have less connection people have less connection to them because there's less investment...sometimes I go days without checking on my mushrooms for like a day or so and then I'm like oh, they're all dead. (S1, P1)

The lack of penalties also contributed to a less engaging experience in some cases, as participants could simply stop playing without concern for any consequences. In contrast, games that include some form of penalty appear to encourage players to return, even if they introduce some stress at the same time.

5.2.2 Stimuli

Regarding stimuli, which could also be viewed as reinforcement, many participants expressed enjoyment in the quick feedback provided by idle games with simple actions such as tapping and clicking. While this facilitated easy access to the game and immediate enjoyment, participants also expressed concerns on their health, especially in terms of dopamine release and being accustomed to rapid reinforcements. Not only from an ethical perspective but also for the overall impression of the game, it would be essential for the idle game designers to consider the player's health. While other types of games could address this by balancing rewards and graphical elements within the game, it could be challenging for idle games given their inherently simple nature. As an alternative, idle games could empower players to autonomously manage their gameplay such as providing customizable goals and integrate regular breaks, consistent with another characteristic of idle games.

“That’s like a whole dopamine hit when you get through different stages and you see your numbers get higher and then that’s why I kept going because I was like, oh, I want to see how high my numbers can get”

(S1, P2)

5.2.3 Challenge

Some challenging aspect presented in idle games had ambivalent reaction as well. Many participants expressed a positive attitude towards challenge and increased difficulty levels over time. Those who mentioned a sense of challenge were rather excited to face more difficulty as they progressed with the game as it increased their sense of accomplishment as well. This sentiment was attributed to the inherent simplicity of idle games, as participants recognized that the addition of some challenges could augment gameplay dynamics without detracting from idle game’s stress-free nature.

“It was challenging but not in a stressful way. I don’t have to think that much to play so it’s less stressful.” (S2, P22)

P22 expressed that the simple nature of the idle game still managed to challenge the player without inducing stress, thereby reducing cognitive load. While simplicity and challenge may seem like contrasting factors, the two elements in idle games can successfully engage players by offering a light-weighted form of challenge.

5.3 Implementing social elements in idle games

Many existing idle games do not have social features to interact with other users within the game. This reflects its essence of simplicity and lack of competitiveness.

Chapter 5. Discussion

Nevertheless, idle game players noted that when they integrated social aspects on their own, they were more engaged with the idle games. These social aspects evoked a sense of competition and connection. For instance, a participant who particularly enjoyed an idle game where you raise mushrooms and collect them shared that they often took screenshots of the new mushroom character they collected in order to share with their friends.

“I had friends in Asia who would play it and then we would show each other like the new mushrooms that we got. . . It’s like a nice way to keep in touch with people when you’re doing something similar” (S1, P1)

Another participant shared that they were introduced to idle games by friends who were already playing. Witnessing their peers’ engagement with the game prompted them to join, with a desire to achieve higher levels of progression.

“Competition. just trying to be better than my friends who are playing it so you can collect the most cookies in a day” (S1, P3)

Incorporating some social aspects into idle games, such as a network displaying the progress of each user, could boost engagement and even foster attachment towards the idle games as shown in previous studies [46, 47, 48]. Integrating social elements would increase player enjoyment and immersion, reducing lack of attachment to the game which was constantly highlighted by the participants as a weakness of idle games. This was due to absence of concrete storyline and significance within idle games, which could be addressed by social connection among players.

5.4 Goal-oriented with mobile, feature-oriented with PC

Participants exhibited different gameplay patterns and motivation based on the device assigned. Those who played mobile games primarily focused on personal achievements such as reaching higher scores or progressing to the next level, setting their own goals on the second or third day.

“For some reason, I wanted to achieve a new high score, and was very irritated when I failed to” (S2, P3, Casual Mobile)

“Being able to upgrade and catch up at a faster rate felt rewarding, and it made me want to progress further into the game” (S2, P23, Idle Mobile)

In contrast, PC game participants constantly sought out new features, such as items, avatar, or theme from the first day. They also expressed dissatisfaction with the lack of new elements and perceived slow progression relatively earlier than the mobile game group.

“I feel like the game is not quite as fun after the first time as once I figured out how to complete levels it felt repetitive” (S2, P16, Casual PC)

“There was no stimulation. I would say this game, due to its simplicity, cannot be sustainable. It’s fun at the beginning as new crops unlock, but besides that, there’s no point of playing this game” (S2, P32, Idle PC)

Chapter 5. *Discussion*

This could be due to the fact that many PC games usually provide an abundant amount of feedback, interactions, and reinforcement that participants were naturally seeking for additional stimuli. Most PC games possess high quality graphical elements and rich game systems while idle games being a subset of casual games are rather defined by their simplicity. This finding also suggests mobile games that offer players a variety of features to set their own goals are more likely to engage players in a longer term. For PC games, constantly updating with new features would be effective. In fact, new features that could be unlocked through the player progression generally attracted players' attention in the study, but were highlighted prominently when playing on PC.

Chapter 6

Design Implications

Through Study 1 (S1), a consensus was reached between participants and researchers on the core characteristics of idle games. The idle games used in Study 2 (S2) were selected based on their alignment with these four criteria. Upon analyzing participants' responses across both S1 and S2, it became evident that these elements are critical for idle games to engage players effectively. The following are the five key elements of favored idle games:

6.1 Being played while away

Previous studies have called idle games as background or ambient games, highlighting their characteristic feature of being played while players are away or not actively interacting [3, 35]. During S1, this attribute was defined as a core element of idle games. Participants who were assigned to idle games during S2 actively took advantage of this characteristic as well. However, it was also noted that carefully balancing resource accumulation or growth rate would be necessary, since it may lead to disappointment if it did meet player expectations.

“most of the reason I play idle games is because I don’t have to like look at it like [other games]” (S2, P1)

The fact that idle games naturally allow player absence as part of gameplay was a key element in attracting players, as it provided a sense of flexibility. Thus, it would support their feelings of autonomy by letting them decide how much effort to invest in the game.

“In order to maximize my rewards, I have to leave this tab open on my computer, and I notice that I always automatically check it. . . But once I collect my rewards, I’m always severely disappointed by how few rewards I got and how few things I can do with it.” (S2, P31)

Since idle games continue to progress, primarily by accumulating resources, players are motivated to check in and return to the game regularly. This behavior reflects macro-level engagement, which encompasses a broader view of interaction, including player behavior before and after direct engagement with the medium [49]. This unique characteristic of idle games that progresses during player absence enables this form of engagement by extending the play experience beyond active gameplay.

6.2 Exponential growth

When players actively engage with idle games, they expect exponential growth rather than a linear progression. However, this exponential growth is typically expected only through active player interaction. Participants felt addicted to idle games that allowed increased resource accumulation or growth as players dedicated more time interacting with the game. This dynamic provided a sense of control and

satisfaction as well, which was why idle game players continue tapping or clicking to earn more resources.

“You still get money like you still get cows if you don’t play, but if you’re there and you’re clicking on it, you can increase the speed at which you get money” (S1, P1)

“The design of the game made me feel calm. It was weirdly satisfying to tap the button quickly in order to produce a lot of chickens!” (S2, P22)

Previous studies have also highlighted that exponential growth mechanics, visibly reflecting players’ inputs, can effectively support engagement [50, 51]. Simple actions that lead to meaningful in-game progression can enhance players’ sense of impact while minimizing stress, as they require relatively low effort or cognitive load.

6.3 A new feature gets unlocked and is visibly applied

One of the most frequently identified codes was ‘stimuli’ which could also be interpreted as reinforcement. Participants consistently expressed a desire for new elements to emerge as a reward for their accomplishments or progression within the game. The absence of new features led participants to lose a sense of achievement and even a decline in motivation to keep playing even when there were other gamification metrics such as scores and currency. Participants specifically highlighted these new features being graphically visible, such as different themes (for mobile casual game), skins and characters (for PC casual game), items (for mobile idle

game), and upgradeable objects (for PC idle game). This phenomenon was evident across both casual and idle games, as well as across both PC and mobile. It highlights new graphical elements as a primary motivator of engaging with these simplistic games.

“It[idle game] will just throw something at me I’ve never seen and I’m just like, oh man I wonder how much more of that is there” (S1, P4)

Players are often motivated by the collectible aspects of a game, as shown in past studies focusing on online collectible card games (OCCGs) [52, 53]. This principle appears to extend beyond OCCGs, applying to other game types as well [54].

“It was fun when there were new features unlocked, but otherwise . . . the only ‘reward’ in that case was the money stacking up, which was I would say one weak motivation to keep playing” (S2, P32)

While the accumulation of collectibles or resources can stimulate player engagement, it is less effective when not visibly presented as feedback or as an active outcome of player actions. The visibility of game elements is crucial for engagement, as it helps optimize the overall player experience [55].

6.4 Appealing graphics and aesthetics

When participants were presented with a text-based idle game lacking graphic elements, 4 out of 5 participants expressed that they would not be interested in playing. They emphasized that graphical aspects determine initial interest in the game, particularly since idle games do not vary much in terms of mechanics. Thus, visually appealing content played an essential role to capture potential players’ attention.

“If they don’t have nice graphics, I usually don’t play them” (S1, P2)

“If there wasn’t so many flashing indicators, bright colors, and pleasant sounds every time you collected something, then I would not be as driven to play the game without all of the positive reinforcement” (S2, P15)

Since the idle games examined in this thesis emphasize the importance of visible feedback, the quality of visual elements plays a significant role. While visual components serve various functions in games, such as usability and interface clarity, their aesthetic appeal is also essential for enhancing immersion and, ultimately, a game’s popularity [56].

6.5 Continuous progress

As characterized in a prior study [2], technical endlessness was defined as one of the key characteristics of idle games. Enabling players to continue to play by saving their progress is crucial for idle games. Participants did not want to lose all of the progression they have made through gameplay sessions and also wanted to see where the ‘end’ of the game would be. This aspect also served as a central motivation for the players to return to the game.

“[Continuous Progress] is an important part because it’s like you can still have progress when you’re not there” (S1, P2)

Continuation desire is one indicator of engagement in games [57]. Allowing continuous play can help keep players in the loop, providing sustained engagement by enabling on-going progression and advancement [58, 59].

Chapter 7

Limitations and Future Work

There are a few limitations to this work that could be considered for future works. First, I examined differences in gameplay experience and engagement only between casual games and idle games exclusively. Including a broader range of game types would strengthen the assertion on idle games being as engaging as other games. Moreover, since the semi-structured group interview involved five participants, expanding the sample size would enhance the significance and findings.

Furthermore, while the second part of the thesis recruited participants regardless of their current gaming status, focusing on active players instead of assigning games to participants and observing their gameplay patterns over time could provide more unaffected thoughts out of voluntary gameplay. In addition, including a wider variety of games could have provided a more comprehensive view of the design elements in player engagement.

Study 2 within this thesis relied on the Game Engagement Questionnaire (GEQ) to measure engagement, with a qualitative approach used for assessing player experience due to the absence of a validated tool to statistically measure gameplay experience. The unique characteristic of idle game engagement may also need a more

Chapter 7. *Limitations and Future Work*

extensive analysis. While previous studies emphasize the importance of observing sustained engagement [11, 59], most idle gameplay patterns involve time spent away from the game. This may not align with conventional notions of active engagement, which are typically associated with micro-level interactions [60]. Prior research analyzing engagement in a mobile idle game also noted that existing engagement models often fail to capture longitudinal engagement across multiple sessions [9].

Chapter 8

Conclusion

Idle games have been identified as a quite unique genre characterized by relatively minimal gameplay. Due to their less interactive aspect, player engagement remained questionable since previous studies primarily focused on the characteristics of idle games or individual games. This thesis aimed to closely explore gameplay experiences with idle games by observing engagement and overall experiences and comparing them with casual games, across both PC and mobile devices.

Findings from the semi-structured group interview (Study 1) helped identify overall perceptions and core characteristics of idle games, which informed the selection of games for the experimental diary study (Study 2). Insights from both studies were then synthesized to identify five key elements of favored idle games, which served as the basis for design implications.

Participants did not show a statistically significant difference in engagement between gameplay with idle games and casual games. This suggests that idle games can still engage players, even with limited interactivity. By integrating qualitative and quantitative perspectives, this work strengthens the understanding of idle

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games. It may also support the future use of idle elements in applications beyond entertainment.

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