Design Test

Play Plants vs Zombies 2 from Egypt 1 through Egypt Level 16. Identify 3 changes you would make to the experience – these can be changes to level design, balancing, plants, zombies, or other gameplay systems or mechanics.

For each item on your list, write out each proposed change in detail as you would in a specification document with various disciplines (art, engineering, animation, etc) as your audience. Make sure to include the intended impact of these changes and how you would justify their necessity along with any risks or edge cases that may need to be addressed.

Applicant

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Disclosure

This Design Test document follows the PopCap® Style Guide found below:
https://static-www.ec.popcap.com/styleguide/PopCap_StyleGuide_031512.pdf

All design test answers are created by Tina Zhang, Nov 21–23, 2023.
PvZ2 and competitor-game screenshots are taken for analytical purposes only.
Other academic references are cited at the end of the design test.

Table of Contents

Assumptions

This section includes assumptions I have made regarding the target audience and company F2P strategies for specifically level Egypt(E) 1 to E16 which I based my design decisions on.

Target Audience

Who are they?

Casual mobile game players who have/have not had prior experience with any tower defence games, and who have just completed the tutorial levels and are now moving onto E1.

This means they have all the knowledge that was taught to them during the garden tutorial level, such as: basic planting and plant knowledge, the sunflower mechanic, defence, basic gravestone interactions, and the different zombie types.

What are their motivations?

To continue playing through the Egypt levels to explore the possibilities of PvZ2.

The Problem

From analysis on level E1 to E16 of Plant vs Zombies 2, I have identified one core problem regarding the overall player–experience which I will propose my 3 changes in attempt to address. The problem is laid out as follows:

> The PvZ2 player experience from E1 to E16 instills too much **player stress** that result in the early termination of the game through:
> 1. Imbalanced chaos factors in level progression,
> 2. the lack of player "safe space",
> 3. monetisation features without clear early game monetisation unity.

Why is Player Stress important?

With an abundance in "other options" on the market, the creation of too much psychological stress, especially at the early game stage, will directly cause the players to quit without any consequences. This is especially true for the casual game market where the players would have intended for leisure and momentary escape rather for stressful experiences that would be justifiable for other game types.

Consequently, this implies the player's need for control in understanding and predicting the possibilities of the game to make judgement on their level of commitment in their early game sessions.

Where do Player Stress Start?

Immediately after the basic tutorial. This is because not only will levels E1 to E16 act as immediate post tutorial levels that need to allow player adaptation, but will also take on the introduction of game features that are original to PvZ2; all the while keeping player engagement for as long as possible and providing the first opportunities of PvZ2 to be monetized.

These demands placed on E1 to E16 implies the possibility for these levels to overwhelm the players, and consequently paves way for too much player stress and the abandoning of the game.

Why is the Problem Valid for PvZ2, level E1 to E16?

I will explain the validity of the problem by providing arguments and evidence that address each of the three sub-problems.

If this research was to be conducted with more allocated time, I would have performed appropriate user research through questionnaires and interviews to ensure the validity of these problems on a larger user base. As of now, all the data are based on my playthroughs and experiences for level E1 to E16.

1. Imbalanced Chaos Factors Create Player Stress

This problem is intended to accentuate the presence of unbalanced game difficulties and zombie/plant introduction discrepancies for level E1 to E16 that greatly increase player stress.

Definition of Chaos Factors

"Chaos factors" represent the elements of the game which the player **does not have control over**. From my analysis of level E1 to E16, I believe these chaos factors can be grouped into three categories: zombie types and their occurrences per level; newly introduced features per level, which includes additional game mechanics, daily calendar events, and new plants; and the changes of these components over E1 to E16.

The Ideal Balance

From the paper *What is Game Balancing? An Examination of Concepts*, the consensus on the criteria of well-balanced games is: "the game becomes consistently more challenging" and "the player perceives fairness by always being able to win, even after early mistakes. This perception extends to offering the player information, control, training and beginner protection" (Becker & Görlich, 2020). Applying these criteria to E1 to E16, it is crucial to

4

establish a consistently challenging progression of levels by providing consistent player information and training to obtain the overall player control.
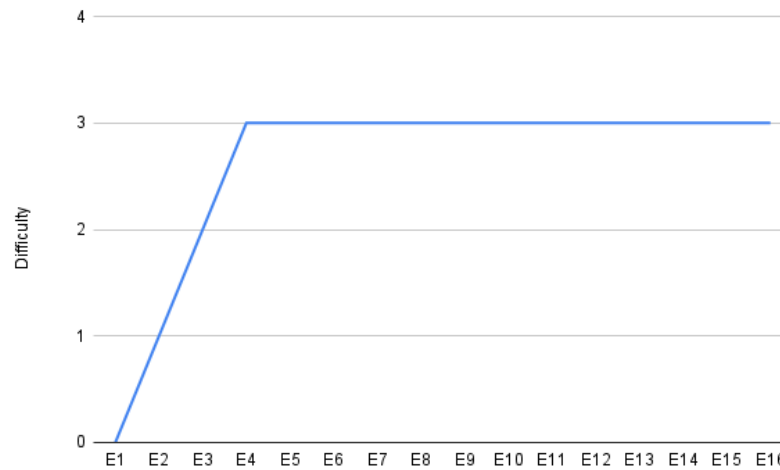

Figure 1. The Ideal Player Difficulty per Level

Figure 1. thus implies the ideal goal for E1 to E16 where player will always be slightly challenged per level but will never be too overwhelmed by the difficulty.

PvZ2 E1 to E16 do not Follow the Ideal Balance, Promoting Player Stress

I first present three charts, each displaying: the types of zombie occurrences over level E1 to E16, and new feature introduced over level E1 to E16.
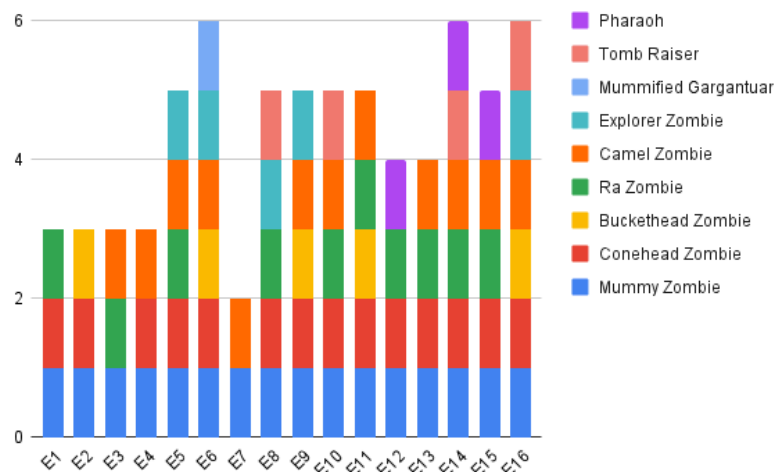

Figure 2. Types of zombies and their frequencies of occurrence through level E1 to E16

From Figure 2. it is clear that there are imbalance present in the amount of zombie occurrences. Although the Mummy and Conehead zombies are almost always present, the rest 7 zombie types keep constantly fluctuating without decisive patterns.
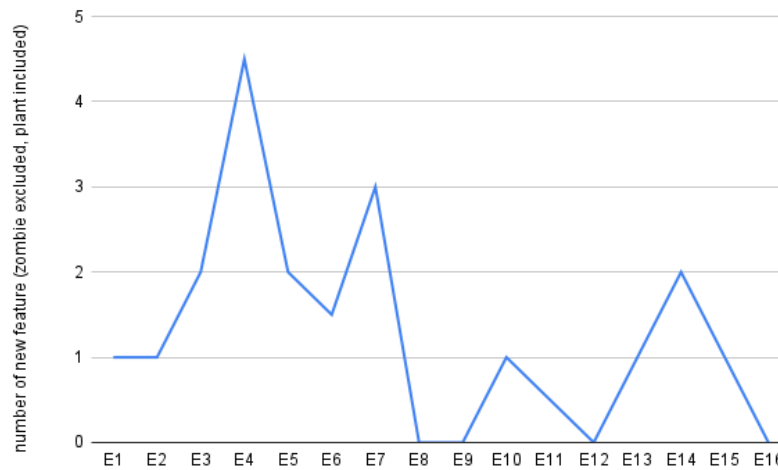

Figure 3. New features introduced per level

From the graph, the introduction of new game features is inconsistent, and has with large fluctuations across the entirety of E1 to E16.

Does These Chaos Factors Affect Player's Perceived Difficulty?

This can be analyzed through the comparison of player's perceived difficulty with the zombie occurrences and feature introductions as follows:

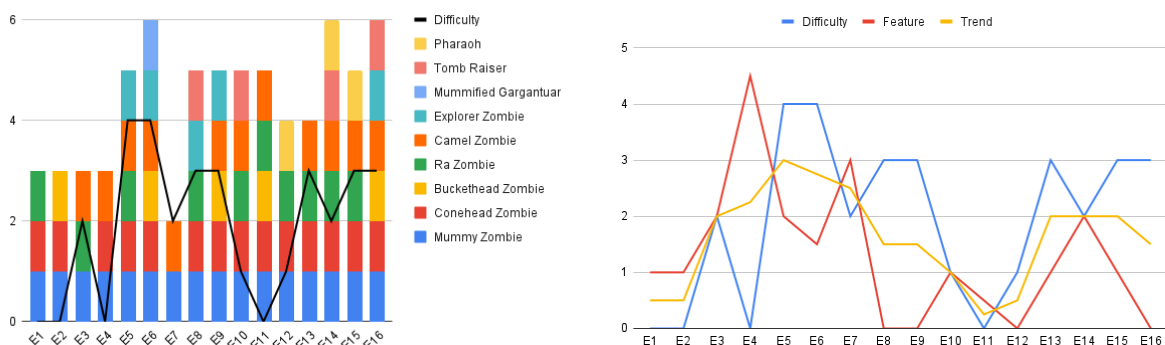*Figure 4. Trend and comparison of zombie types and feature introductions with perceived difficulty*

From observing the two graphs above, it is clear that both graphs display similar sinusoidal trends that is reflected in the player perceived difficulty plot. Therefore, through the adjustments of these chaos factors which may reflect in more consistent player control and perceived difficulty, the player stress can be reduced.

2. Lack of Player "Safe Space" Creates Player Stress

From player assumptions and *Statistica* data, it is possible that the average time the player will spend on E1 to E16 after the initial tutorial stages will be around 10 minutes. This will place the player at in between E3 and E4, where they will be directed out of the levels to view the Almanac. This will then present them the opportunity to explore the current game interface options.

The purpose of the player safe space is then to provide enough information to promote player interest, and a calming environment for them to rest and recuperate to continue playing the game. The intention is to not creat too much stress for the player to exit out of the game.

Competitor Analysis

Below are some of the examples of player "Safe Space" in other mobile games:

PvZ. Safe Space, Level Selection
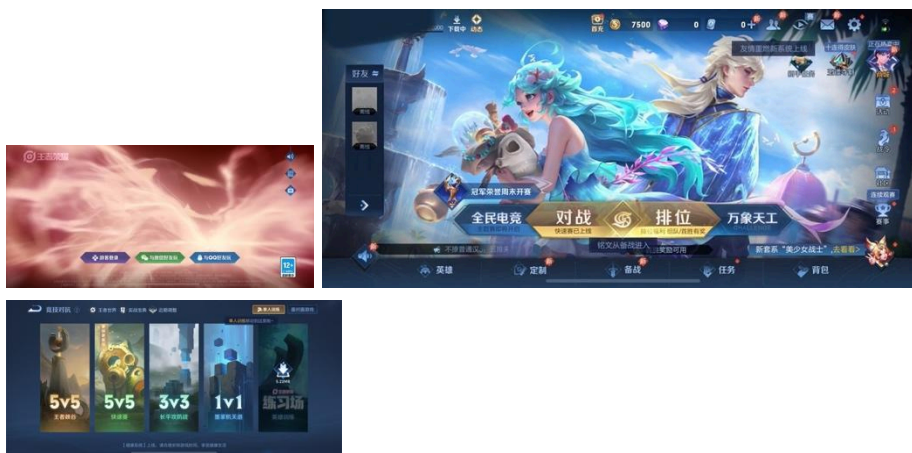
Honor of Kings. Initial Screen, Safe Space, Level Selection
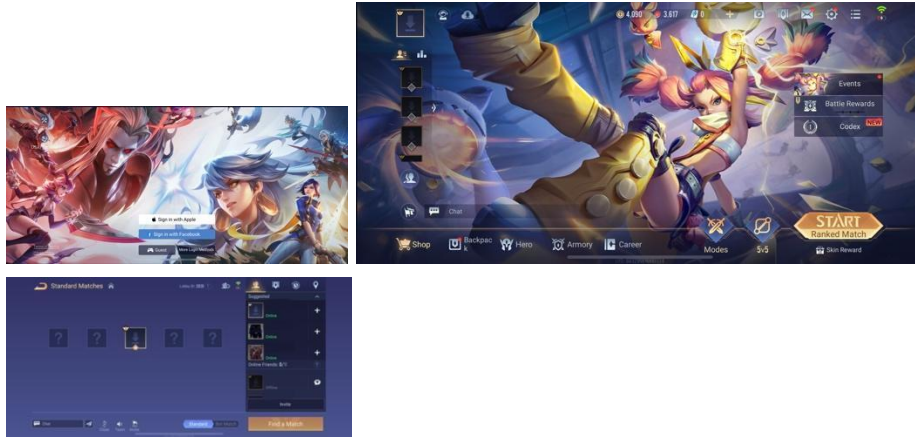
Arena of Valor. Initial Screen, Safe Space, Level Selection

Cookie Run: Kingdom. Initial Screen, Safe Space, Level Selection

AFK Arena: Initial Screen, Safe Space, Level Selection

From the above initial screen–safe space–level selection analysis from the five popular mobile games, it can be concluded that they share some common qualities.

1. The Safe Space is distinctly different from the initial screen and level selection, which provides mental refreshment from repetitive level progressing.
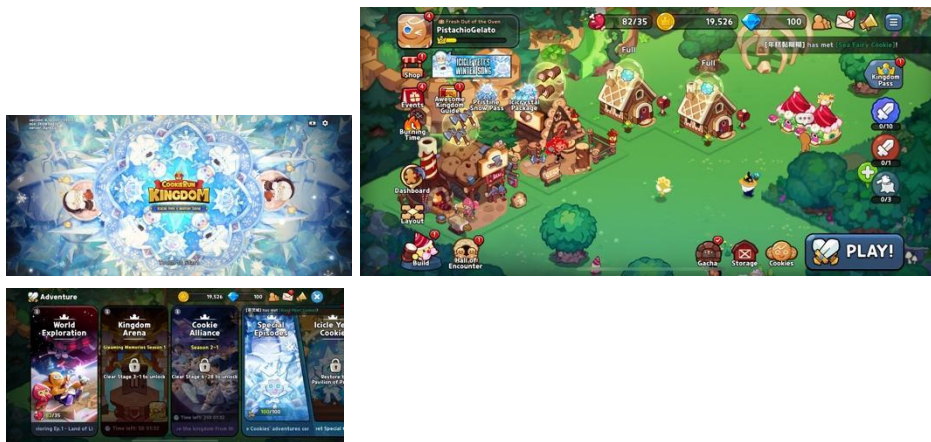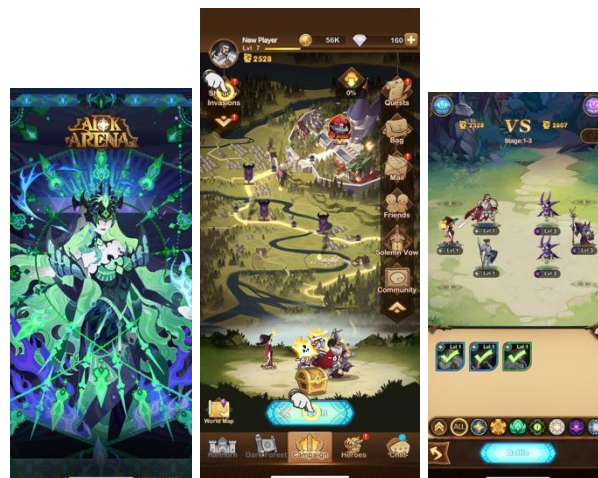2. The Safe Space usually includes full illustration with animated components or full-on animation that can be played on loop to maintain player attention.
3. The Safe Space contains all in game options, whereas actual level screens only show level-related options to avoid crowding.
4. The player feels comfortable staying in the Safe Space and has full control over their next steps in the game.

Lack of Safe Space in Current Game Interfaces

Below are the main interfaces of the PvZ2 that are available to players on levels E1 to E16.

PvZ2 E1 to E16: Initial Screen, Safe Space, Level Selection

Now, to analyze the PvZ2 interfaces against the previously concluded qualities of the player safe space, there are significant discrepancies:

1. Navigating from the level selection section to the safe space as a player would during the E3 to E4 Almanac gap, there are too many similarities between the level selection screen in terms of color scheme, design, and layout which does not give players the mental refreshment. Therefore, the safe space feels like a continuum of the game levels, which adds onto player stress.
2. There are no animated components or full illustration to the safe space which does not maintain player attention. The player can then easily navigate using the same button to the initial screen, which has just the login information, and then exit.
3. Both the safe space and the level selection has every option within the game. This creates player anxiety within the level selection when they might have lost the tougher levels such as E5 and E6, wishes to take a break, but then is bombarded with too much information right on the level selection screen.
4. Although the current safe space offers all the options to settle on their next step within the game, the similarity to the level selection screen creates player stress.

3. Crowding of Monetization Features that Lacked Overall Unity

Observing the early monetization possibilities in E1 to E16, there are many ways of monetization PvZ2 early game including the shop button that contains all the pay-to-play possibilities, the in-game plant selection menu that shows pay-to-unlock possibilities for Snow Pea, Power Lily, etc., as well, there are also the rent a plant option, plant powerup feature, and many miscellaneous options. However, throughout my multiple E1 to E16 playthrough, it has never crossed my mind the need to purchase any items, or even level up my plants in the first place! (I was able to complete the entire Egypt level without considering plant powerup, more plant types, or have wanted to purchase the daily gift piñata even though it is free)

A part of this is due to how the balancing of this game allows it to be **easily completed** using just the basic free-to-play plants without any coin or diamond investments and in an engaging manner, but another part is also from the **lack of player insights** into how having other types of peashooters or having more diamonds or plant food is going to make the player experience better.

This is a direct **clash of design interest**, where on a level design perspective, it is crucial for the level design to not be too difficult to ensure long player engagement and investment; but on a monetization perspective, there is a need for player challenges that promotes player payment to ease their in-game experience.

Consequently, there seems to be no overall unity between the level design and the pay-to-play options that clarify to the player a need for payment to better their in-game experience. Therefore, the overall abundance of monetization options but the lack of player needs just create more mental rejection and stress for the players at the starting stage.

The Goal

With the problem in mind, the goal for the proposed 3 changes on E1 to E16 is to promote clarity in level relations, prolong player engagement, and to encourage early F2P strategies to promote after-tutorial monetisation.

The Three Solutions

I will now be suggesting three possible changes to tackle the problem mentioned above. It is to note that I am writing with in mind that these changes are proposals only, therefore, I will not be making any estimation or assumption on budget, time, or process. There are all changes I believe would greatly improve the user experience of the game with the assumed problems, datasets, and goals presented so far.

Tackling Excessive Chaos Factors in E1 to E16 Level Progression

Observing the Figure 2. graph, there are two segments of concern (E5 to E6, E9 to E12) which this change will address to bring the overall player perceived difficulties to the desired "slightly challenging" per level.

Observing E5 to E6 which stood out for being too challenging, the data validity can be backed by both the spike in the new feature category: introduction of conveyer belt, piñata, Frisbee plant, and plant upgrade mechanics in E4, as well as the introduction of the cave explorer zombie immediately followed by the Mummified Gargantuar.

Regarding E9 to E12 and its lack of challenge, it can be backed by the clear drop in new feature introductions, and E9 to E11's lack of new zombie appearance. As well, the new features are only the grave-eater plant for E10 which has less overall gameplay impact as it is not offensive, plus E11 having no plant selection, which is a minor change. Therefore, the only significant challenge to the E9 to E12 segment is the introduction of the Pharaoh zombie at E12, but nonetheless the player would have gotten familiar with the existing mechanics, therefore the ease.

The Approach

The reduction of chaos factors can be tackled through the limiting the maximum new features introduced per level to two at most to promote player familiarity, and the consistent introduction and keeping of zombie types to increase player awareness and prediction for future levels.

New Feature and Zombie Introduction

Below is a table that contains all the new features and zombies of E1 to E16. I have rated them as **red** for necessary, **green** for not necessary for that level.

	New Features	New Zombies
E1	**Plant Food**	**RA**
E2	**Preserved powers**	
E3	**map, Sandstorm, number on preserved powers (explained E5)**	**Camel**
E4	**conveyer belt, bloomerang plant, piñata, plant upgrade**	
E5	**ice cabbage plant**	**Cave Explorer (explained E8)**
E6		**Mummified Gargantuar**
E7	**Travel log, daily calendar, event** (Difficult to change)	
E8		**Tomb Raiser**
E9		
E10	**grave eater plant**	
E11	**no level selection** (Difficult to change)	

E12		Pharaoh
E13	mold	
E14	bonk choy, plant garden not directly introduced	
E15	endangered plants	
E16		

Change to New Feature and Zombie Introduction

With consideration of Figure 3, and pre–existing in game features, I have modified the introduction of new features and zombies as follows:

Blue for moved items

	New Features	New Zombies
E1	Plant Food	
E2	Preserved powers	RA
E3	Map, Sandstorm	
E4	conveyer belt, bloomerang plant	Camel
E5	number on preserved powers (explained E5)	
E6	Piñata, plant upgrade	Mummified Gargantuar
E7	Travel log, daily calendar, event (Difficult to change)	
E8	ice cabbage plant	Cave Explorer (explained E8)
E9		
E10	grave eater plant	Tomb Raider
E11	no level selection (Difficult to change)	
E12	plant garden	
E13	mold	
E14	bonk choy	Pharaoh
E15	endangered plants	
E16		

Notice I have paired new zombies and new plants that can tackle such zombies on the same level in hope for players to be able to figure out such relations themselves.

Changes to Zombie Occurrences

From previous analysis, I believe it is crucial to establish zombie occurrence consistency especially on the newly introduce zombies to create player familiarity. Therefore, all the adjustments will be on the Mummy Zombie, Conehead Zombie, Buckethead Zombie, and Ra Zombie as they have been available for the longest time.
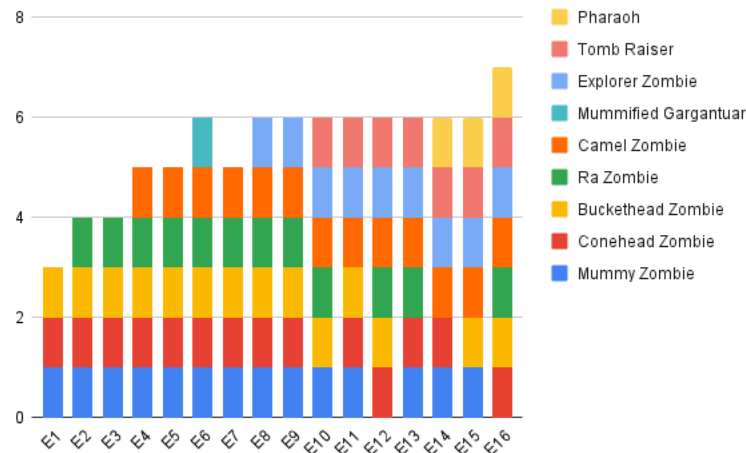

Figure 5. New changed zombie occurrences

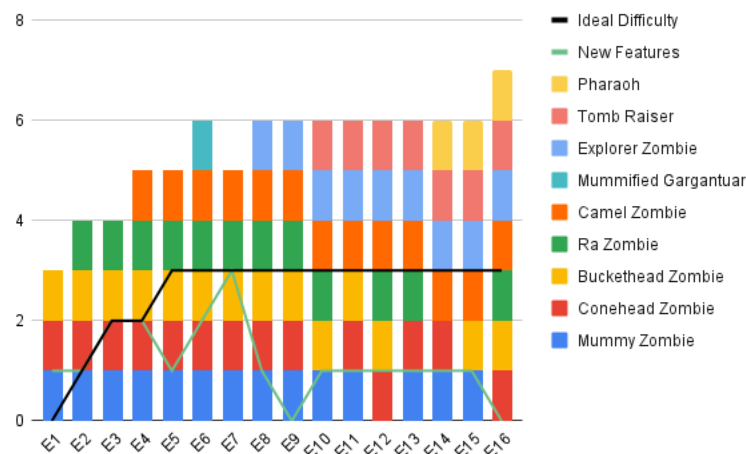## Zombie Occurrences Comparison to New Feature Introduction

Figure 6. Zombie Occurrences, New Feature Graph, and Ideal Difficulty

Viewing the final graph, there is a clear zombie occurrences trend which the player can predict, as well as the reduction in new features to promote player familiarity. As a result, this change may hopefully instill more player stability and reduce chaos factors which overall improves player engagement and lessen player stress.

Designing a Stress-Free User Interface

It is clear from the problem section that the current player safe space for PvZ2 E1 to E16 does not adhere to the competitor analysis conclusions. Therefore, the intension for this change to is to **propose a new valid layout** of the existing page to address and resolve the lack of recuperate space after the initial expected 15 to 20 minutes spent in game levels.

Implementation Feasibility

This is not a complex change; however, it requires collaboration from concept artists, UI/UX designers, programmers, illustrators, and animators to successfully actualize the change.

The Approach

With the design goal of the four safe space specifications in mind:

1. The Safe Space is distinctly different from the initial screen and level selection, which provides mental refreshment from repetitive level progressing.
2. The Safe Space usually includes full illustration with animated components or full-on animation that can be played on loop to maintain player attention.
3. The Safe Space contains all in game options, whereas actual level screens only show level-related options to avoid crowding.
4. The player feels comfortable staying in the Safe Space, and has full control over their next steps in the game.

This change can be made following the internal project collaboration process.

The consequential impact of the actualization of this change would be a better player safe space to level E1 – E16 flow that prolongs player engagement and provide player recuperation opportunity which in turn releases player stress.

Example

My own quick mock-up of the revised player safe space:
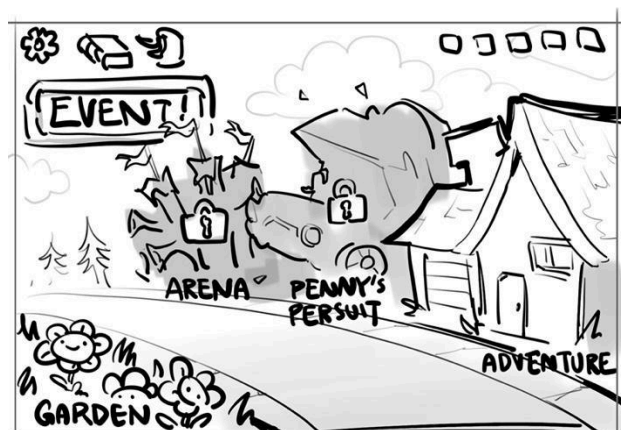
Creating Monetization Purpose

The discrepancy of level design and monetization intent can be solved by the introduction of the banner gacha system on the pay–to–play plant collection.

Why the Gacha System?

The integration of the Gacha system provides opportunity for direct player involvement in monetization.

One of the issues regarding the early game monetization problem is the lack of player need to actively seek out pay–to–play mechanics due to the lack of challenge in the E1 to E16 levels.
However, with the gacha system, during the playthrough of E1 to E16, the gacha system can actively prompts the player to participate in the gacha mechanics.

Competitor Gacha Mechanics Study – Cookie Run: Kingdom

After the basic building and leveling introduction, one of the quest rewards is a "cookie cutter", which the tutorial instruction enforces the player to use on their Gacha interface as a ticket for one pull in the gacha system.
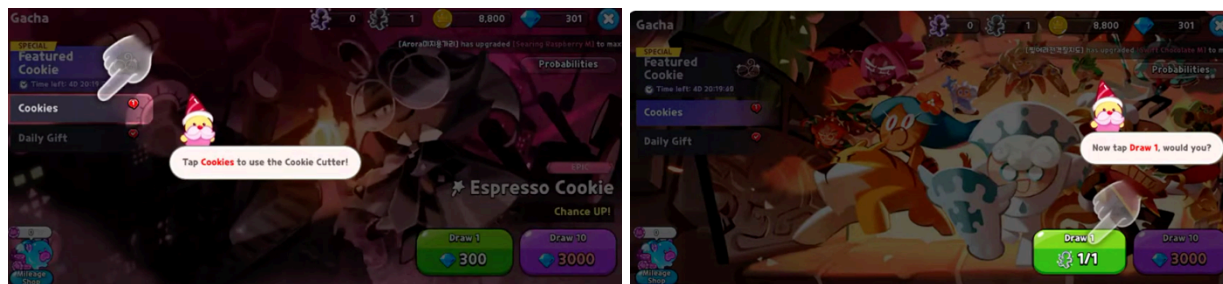

This creates player awareness of the Gacha page which they will actively seek out when they obtain such tickets again.

Similarly, PvZ2 E1 to E16 can implement event that actively direct player to the gacha mechanics through the providing of the gacha tickets for free.

The Gacha System allows for an implicit pay-to-play strategy.

The current PvZ2 early monetization methods use an explicit pay–to–play strategy where the price of items is directly displayed:
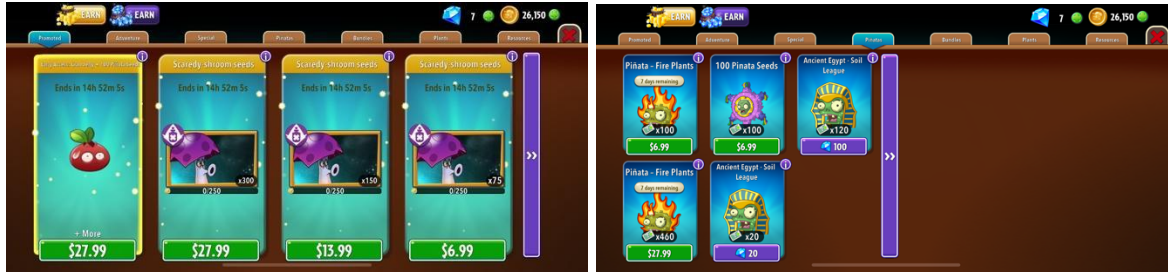
Although players who are especially interested in the item will not mind the price transparency, to players who do not have significant care about specific items, the explicit display of price may deter them from visiting the pay-to-play interface at all as they can immediately make judgements on the affordability and playability of the game.

However, for the gacha system that is usually dependent on tickets or gems, the real-world currency is always only available for ticket/gem purchasing purposes. Therefore, this allows the player to shift awareness from the real-world price conversion to the actual gacha mechanics.

Competitor Gacha Implicit Pay-to-Play Study

Observing Cookie Run: Kingdom Gacha mechanics again, the cost of gacha pulls are always represented by in game currencies that sometimes goes through various game currency conversions which leads to its real world price unrealized.
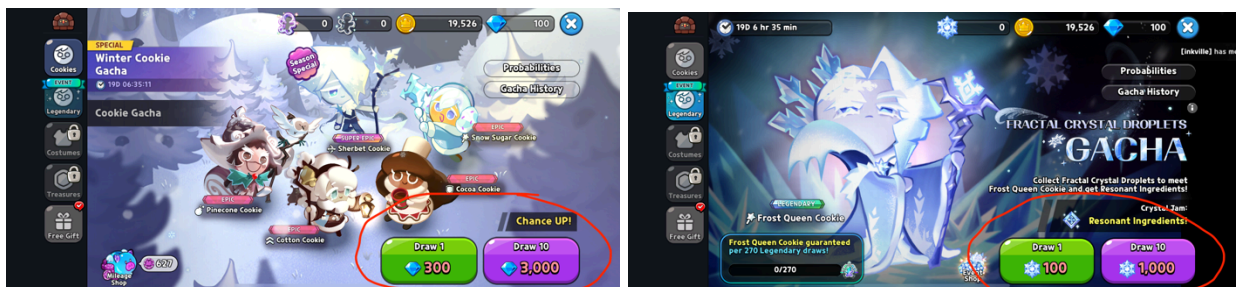
The only aspect of the game that allow for explicit currency display is at the currency purchasing level. Comparing to PvZ2 pricing of 7 dollars per plant, the spending of 7 dollars on Cookie Run: Kingdom only grants the player around 2 draws whose chance of obtaining the actual wanted characters is bleak. However, this is usually not realized by the player, as the real-world currency to in game currency conversion is usually overlooked by the player.
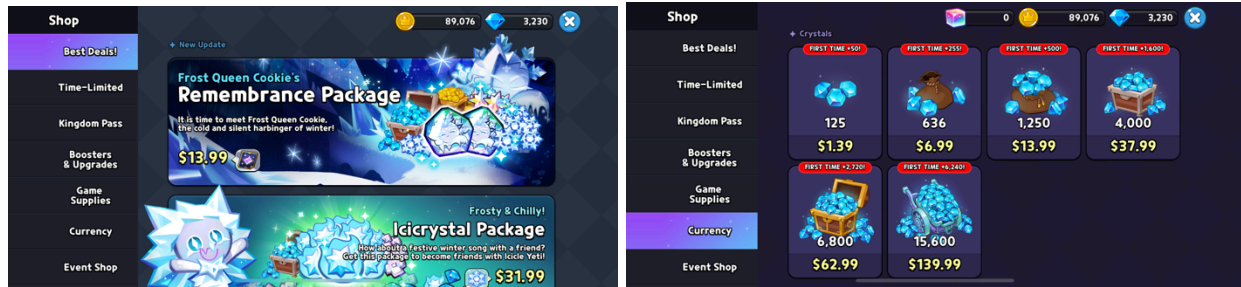
Consequently, this advocates for the implicit abstraction of the pay-to-play strategy.

Gacha System allows for a character centric approach to gaming.

Although certain user base of the PvZ2 community play due to their interest in the PvZ2 gaming format, a lot of players play due to nostalgic factors towards the PvZ IP. Therefore, whether if the gaming format is 3D shooter or 2D casual, the classical plant and zombie dynamic naturally attracts audience.

As a result, gacha system would greatly increase player attention as it calls for attention on the collection of plants itself (with the possibility of even introducing Zombie banners). Through the direct association of this gacha mechanics to monetization possibilities, and the abstraction of real-world currencies, the gacha system can be a successful cure to the level and monetization design conflict.

Current PvZ2 E1 to E16 Already Support Gacha Possibilities

The current PvZ2 level E1 to E16 already supports gacha integration through the presence of many pay-to-play plant possibilities that can be easily converted into Gacha banners; the existence of the virtual currency of the blue gem that can be directly used as gacha tickets; and the plant store section that can be converted into a page for gacha events.

Also, the piñata system can be converted into free daily gacha banners that directs further player attention onto the gacha page.

Therefore, not only can the gacha mechanics unify the player E1 to E16 early game experience with valid monetization possibilities, but it can also reduce player stress due to awareness of monetization possibilities and the setup of character centric approach to the game.

Thank You for Reading!

References

Becker, A., & Görlich, D. (2020, April 21). *What is Game Balancing?An Examination of Concepts*. Retrieved November 23, 2023, from https://journals.itiud.org/index.php/paradigmplus/article/view/7/4

Zandt, F. (2021, December 2). *Mobile Gaming: Just A Quick Fix?* Retrieved November 23, 2023, from https://www.statista.com/chart/26324/average-time-per-day-spent-on-mobile-games-on-android/