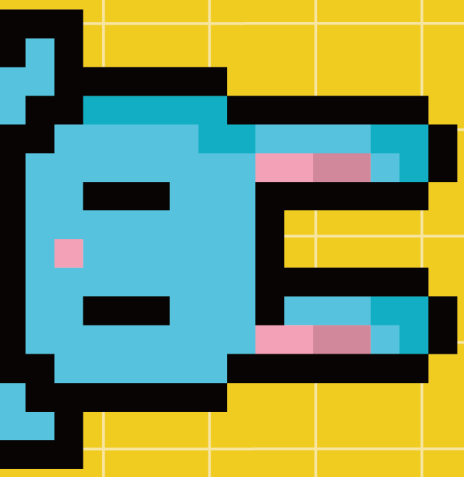
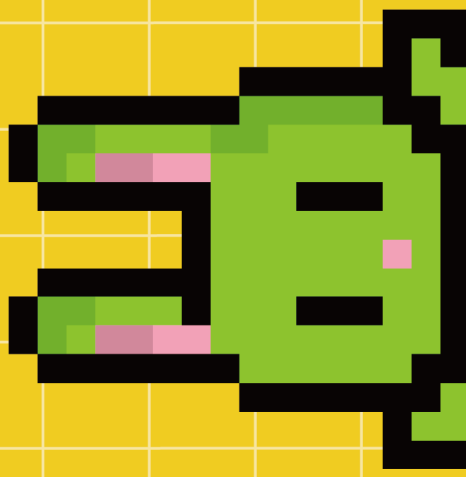
MASTER
THESIS
AUG,2019

HOMETREE

GAMIFIED TOOL TO INCREASE CREATIVE SESSION ENGAGEMENT FOR PARTICIPANTS WITH DIVERSE BACKGROUNDS





AUTHOR

Zhe Duan

Gamified tool to increase creative session engagement for participants with diverse backgrounds

Master Thesis
August, 2019

Author
Zhe Duan
Design for Interaction (MSc.)
zero2zheduan@outlook.com

Supervisory team
Project Chair:
Prof. Han van der Meer
meer@innovation.nl

Project Mentor:
Simon Tiemersma
S.A.Tiemersma@tudelft.nl
Katrina Heijne
K.G.Heijne@tudelft.nl

Company Mentor:
Frank Stemerding
frankstemerding@ranj.nl

Industrial Design Engineering, Delft University of Technology
Landbergstraat 15, 2628 CE Delft
+31 (0) 15 278 9807

Acknowledgements

Thanks to my great chair Professor Han van der Meer and mentor Katrina Heijne for supporting and guiding me everything about creative facilitation even far before the start of the graduation project. Also thanks to my great mentor Simmon Tiemersma and my company mentor Frank Stemerding. Your rich experience of game design helped me better understand how games work and fullfilled my dream of designing a game.

Thanks to all the emplyoyees at &ranj and fellow students who filled in my questionnaire and participated in my interviews and creative sessions. This project could not be done without your enthusiastic help.

Thanks to my dear friends, with your accompany at the Room Gertrude Stein in TU Delft library in the last period of the graduation project, I can get through it under so much pressure and anxiety. It's my luck to encounter and be friends with all of you in Delft.

Last but not least, my deepest gratitude to my mother, who gives me the chance to do what I like and endless love.

Executive Summary

WHY GAMIFY CREATIVE SESSION?

The relationship between creative session and game

A creative session is a lot more than a session of generating ideas. It's part of a much larger goal of delivering innovation in a company. It is necessary to get everyone on board and motivated. And when the motivation levels reached, then beautiful things can happen.

In order to achieve certain motivation level, fun is essential. Fun fosters open-minded and creative thinking. It's imperative that people feel the engagement during the creative session. Being engaged in the creative session is not just about paying attention. With positive emotions, people would stimulate themselves to put more effort and energy which formulates a positive loop. And game is the main media as the fun-generator. There is a huge opportunity that puts the game experience to the creative session to explore and examine business challenges, to improve collaboration, and to generate novel insights about the way the world works and what kinds of possibilities we may find there in a playful way.

The assignment

This project is a collaboration with &RANJ. &RANJ is a serious game company with the aim of " unravelling the magic formula of games step by step and discovered how we can apply it to changing human behavior". In the &RANJ's game design process, creative sessions take up an essential part to formalize creative problem solving internally, or together with stakeholders of clients. Therefore the main objective of this project was to develop a toolkit for the creative session based on gamification methodology to stimulate engagement of participants.

The research

An explorative research was conducted to explore opportunities, insights that could be used in toolkit design. Four different research were carried out: creative session in practice, questionnaire for creative session, interview at &RANJ, and tech research for creative session. Based on the explorative research, the problem as perceived, insights in different creative session stages, insights for the whole session were summarized. See chapter3. The insights gained throughout the research were integrated into the design toolkit.

HOW TO GAMIFY CREATIVE SESSION?

Design direction

Based on insights gained from exploratory research, a design direction with design goal, design focus, design dart were synthesized to guide the toolkit design. More elaboration can see chapter 4.

According to the identified design direction, the design toolkit shall focus on increasing creative session engagment for participants with diverse backgrounds. To be specific, the goal of this design toolkit is to **stimulate a sense of fun collaborative autonomy especially for non-designer participants to better get committed to the creative session based on gamification theory.**

Gamified creative session toolkit framework

A gamified creative session toolkit framework was designed to facilitate the creative session process. For each creative session stage (call it "challenge"), it contains chosen creativity techniques, artifacts, types of play and applied game mechanisms. All these things aim to achieve the session goal, the game goal and the emotion goal respectively.

Under the framework, in each creative session stage (redefine problem, diverging, reverging and converging), several playtests happened to iterate the design concept. In the end, the final design connects 4 stages in the creative session together to **set four sequent mini-game challenges within a complete story to support participants with diverse backgrounds to get committed to the creative session process.**

Evaluation test

To what extent and how does the gamified toolkit reinforce the motivations of: fun, collaboration and autonomy for participants? Based on the main test goal, the gamified toolkit has been evaluated with participants from different backgrounds like game deisgners, developers, project managers and clients to fully validate the effect of the toolkit within the complete gamified creative session experience.

The key points of the project process is shown in figure 1. – – – – – – – – – – – – – – – – – – 👉

Project Scope → **Theoretical Background**

- Future - Oriented Project
- Core Creativity Technique Re-adapt
- Gamified Experience

- 3 Creative Diamonds
- Basic Game Elements
- Intrinsic Motivation

Ideation ← **Synthesis** ←

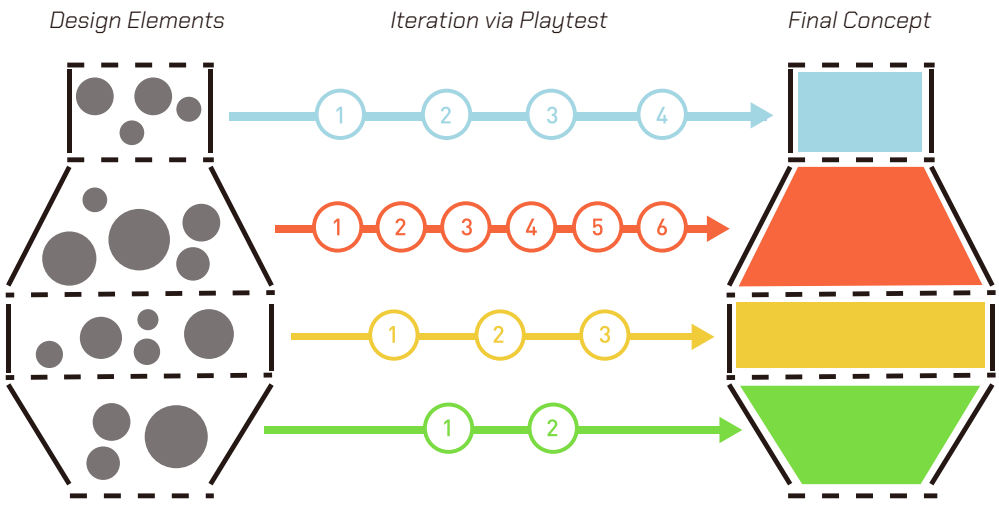
Session 1 & Session 2

Find and verify **Design Elements** that contribute to the design goal

- **Design Goal with Intrinsic Motivation**
  How to spark a sense of **fun collaborative autonomy** among participants with diverse backgrounds in the creative session?
- Design Creteria

↓

Conceptualisation



Explorative Research

- *Context Research*
- *Questionnaire for Creative Session*
- *Interview at &RANJ*
- *Tech Boost for Creative Session*

Creative Session Process in Practice

Core Frequently-Used Creativity Techniques

Motivational Needs

Define the Target Group

Digital Interaction Intervnetion

(De)motivating Factors

- *Opportunity*
- *Problem*
- *Insight*
- *Emotion*

- **Deisgn Goal**
  How to involve partiicpants with diverse backgrounds being fully committed to the creative session process in a playful way?
- Insights for creative session process

Final Design

- **A gimified toolkit that includes four sequent mini-game challenges within a complete story to support participants with diverse backgrounds to get committed to the creative session process in a playful and tangible manner**

Evaluation Test

Fun

Collaboration

Autonomy

In-game Actions

Figure 1. Key points of the whole project process

Table of Contents

1. Project Introduction

In this chapter

This chapter describes the project background, scope, research questions and methods. It provides a research plan for the next research stage

1.1 Introduction

1.1.1 Background

Creative session, for the companies who value creativity within the innovation process, is a group workshop adopted for solving open-ended problems or opportunities (Sawhney, 2015). Currently there is a growing demand for these companies to organize creative sessions to transform the development of group's creative thinking into the company's holistic innovation power (Drucker, 2014) .

1.1.2 Initial Assignment

This project is a collaboration with &RANJ. &RANJ is a serious game company with the aim of " unravelling the magic formula of games step by step and discovered how we can apply it to changing human behavior". Since 2019, for more than twenty years &RANJ has achieved behavioral change through play. From their creative studio in Rotterdam, they work on serious games and gamification for a variety of customers and issues.

In the &RANJ's game design process, creative sessions take up an essential part to formalize creative problem solving internally, or together with stakeholders of clients. To stimulate more involvement of stakeholders in creative sessions, &RANJ desires to **develop a toolkit for the creative session based on gamification methodology.** This toolkit, which could be digital or physical, should stimulate engagement between participants. Ultimately, the design shall encourage stakeholders to better identify the value of gamification.

1.1.3 Project Scope

The design that will be created for this project is expected to be used in creative sessions held by &RANJ. The boundaries that come along with the company are explored in this part. A couple of factors determine the scope of this project.

Future - Oriented Project

This graduation project explores the new possibilities of creative sessions. Instead of a total problem - solving project, this project puts a future perspective lens on the creative session and is concentrated on exploring the most inspiring future session experience for participants to better unleash creativity.

Core Creative Facilitation Technique Re-Adapt

There are over 80 different major techniques for creative facilitation since 1939 when advertising executive Alex F. Osborn began developing techniques for creative problem-solving(Parker, 2004). Instead of covering all creative facilitation techniques or creating new techniques, this study is mainly focused on selecting core creative facilitation techniques and re-adapt them to cater to the new interactive environment of creative sessions.

Gamified Design

This project is concentrated on gamifying the creative session process. Other design considerations concerning helping the experience of creative sessions, are used for inspiration and insights.

1.1.4 Project Aim

The aim of this graduation project is to develop a gamified toolkit that supports &RANJ to intentionally apply gamification methodology to creative facilitation to increase skateholder's engagement in the session.

1.2 Project Approach

1.2.1 Project Structure

The project consists of 3 parts.

- The first part is the research part. Combining with theoretical and practical research, knowledge from the domain of creative sessions, gamification and novel interactions are obtained. This part ends with a summary of design insights as a guidance for the later design.
- The second part describes the steps that were taken from a design direction to available design elements. Via integrating these design elements, at least 3 rounds of iterations for each creative session stages were made for formulating the final design.
- In the final part, the final design was elaborated and an evaluation test was conducted.

1.2.2 Research Plan & Methods

The following questions form the basis for the research. These questions are divided over two themes to try to explore for collecting related knowledge: creative sessions and gamification. The research plan also indicates the methods the graduate student used for finding answers to these questions. Literature review is to narrow down the problem scope and find the overlap between creative sessions and gamification. Quesionnaires are applied to collect quantitative data to find general opportunities for most target group (Treiman, 2014). Interviews and observations are applied to collect qualitative data to find the meaning behind the phenomenon (Grbich, 2012). And playtest is the method in the game indusdry that quickly receives feedbacks from players to gain insights and ideas within the purpose of research.

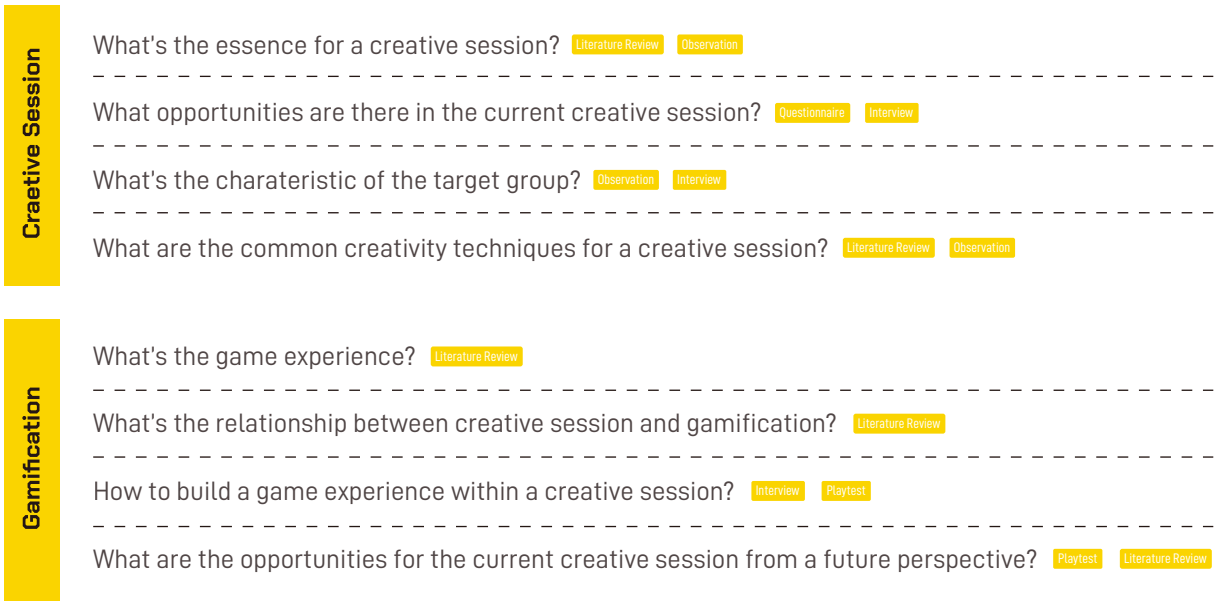


Figure 2. Research Plan

1.3 Key Take-Aways Chapter 2

Project Scope

Future - Oriented Project: Explore the most inspiring future session experience for participants to better unleash creativity.

Core Creative Facilitation Technique Re-Adapt: Focused on selecting core creative facilitation techniques and re-adapt them to cater to the new interactive environment of creative sessions.

Gamified Design: Put the game experience to the creative session experience to increase engagement for participants.

Main Rearch Questions

- **What opportunities are there in the current creative session?**
- **How to build a game experience within a creative session?**

The other more research questions can be checked in chapter 1.2.2 Research Plan.

2. Theoretical Background

In this chapter

The literature research is used to define what is creative session and what is gamification. And the most important is to find the connection point between these two domains

2.1 Creative Session

Before the theoretical background research, there are several questions that expect to be answered based on the research plan in chapter 1.2.2:

- What's the essence for a creative session?
- What are the common creativity techniques for a creative session?
- What's the game experience?
- What's the relationship between creative session and gamification?

2.1.1 Theoretical Framework

Creativity is the cause, and innovation is the effect(Nystrom, 1979). And there is a practical approach towards organizing and facilitating creative sessions, which is called **iCPS, short for integrated creative problem solving** (Buijs and van der Meer, 2013). The essence of this approach is an active role of the creative facilitator in leading a task-oriented group. The group is made up of specially selected volunteering professionals, the so-called **resource group**, who are required to come up with new and feasible ideas for a specific problem.

A core principle in the iCPS process is the **creative diamond**. It includes three phases of diverging, reverging, and converging ideas. The diverging phase starts with an exploration of possibilities and generating as many ideas as possible. In the reverging phase, the generated ideas are clustered and categorized. And finally, in the converging phase, the clustered ideas are selected and iterated based on their own feasibility and originality (Tassoul, 2007).

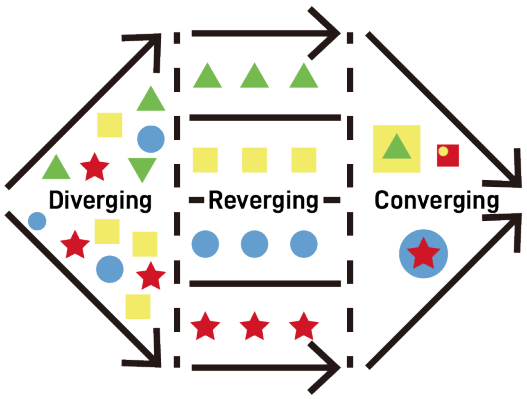


Figure 3. Framework of creative diamond

2.1.2 Creative Process

In the American Buffalo CPS tradition (Parnes, 1967), the creative process that the resource group involved is not restricted to one single creative diamond but makes up with a sequence of five different diamond-shaped steps:

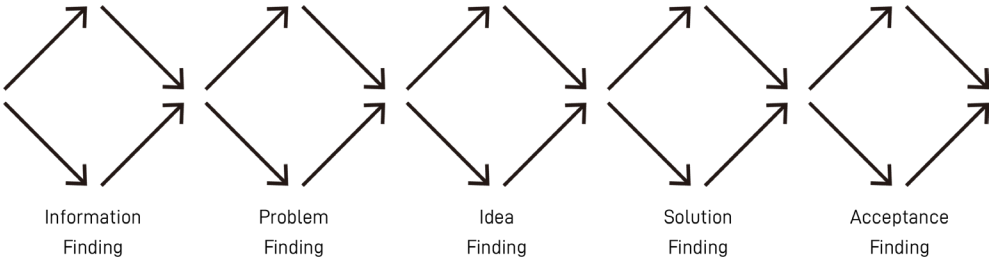


Figure 4. The five buffalo CPS stages (Parnes, 1967)

Compared with the tradtional linear CPS approach, Integrated Creative Problem Solving (iCPS) is the attempt to serve for European (Buijs and van der Meer, 2013). iCPS consists of four interdependent sub-processes: Project Management, Information Finding, Acceptance Finding and Content Finding. See figure 5 below.

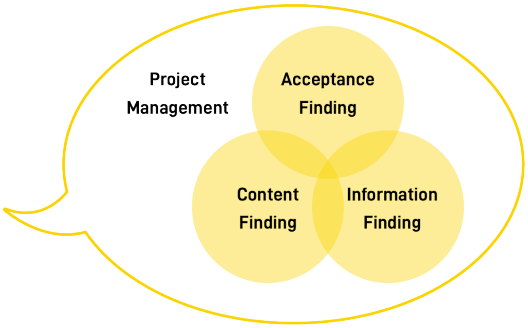


Figure 5. The basics of iCPS in 4 sub-processes

Project Management is the basis

The session in itself is a challenging endeavour and a complicated project in its own right. The practical aspects of organizing and running a creative session are crucial for success and should be nurtured. Therefore project management is the basis of the iCPS approach.

Information Finding: A continuous "reality check"

In this preparatory step, as much information is gathered as possible to understand the essence of the topic the problem owner would like to have solutions for. Information finding is carried outside the creative session to gain deeper knowledge on specific options or fields of options.

Acceptance Finding: A separate and main actiivty

Inviting the relevant stakeholders to become members of the resource group influences the accpetance of the solution immensely. It's a form of early user/stakeholder involvement.

Content Finding: The three-step core

Among four sub-processes of iCPS, project management , information finding and acceptance finding are all faced up with the operations of facilitators, while content finding serves for the resource group in the creative session. Considering the project aim is to design a gamified expereince for the resource group, therefore the most concentration would be put on the process of content finding. And content finding includes three diamond-shaped steps (Katrina & van der Meer, 2019):

1. Problem Finding: Defining the problem
2. Idea Finding: Generating and selecting options
3. Solution Finding: Improving the options

In the first creative diamond, the resource group explore and redefine the problem. In the second diamond, the resource group generate and select promising ideas. In the third diamond, the resource group make the transition from these promising ideas to implementation in the real world.

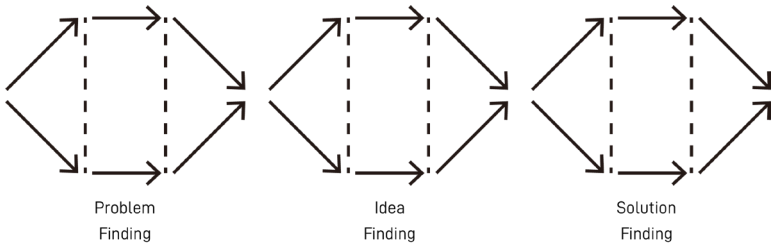


Figure 6. The 3 diamonds of the Content Finding sub-process of iCPS (Katrina & van der Meer, 2019)

2.1.3 Basic Principles for Good Facilitation

For an excelllent creative session, a good facilitation is essencial. There are three basic principles with respect to a facilitated creative session:

1. Role Rigidity

The roles and responsibilities shall be clear throughout the facilitation process. It is essential to differentiate these roles and to manage them. A mix of the roles between Problem Owner and Facilitator shall be avoided considering the quality of the outcomes of a creative session. The table below summarizes the characteristics and responsibilities of the problem owner, facilitator and resource group (Katrina & van der Meer, 2019).

Problem Owner	Facilitator	Resource Group
Characteristics:	**Characteristics:**	**Characteristics:**
• Involved • Motivated to find a solution • Competent and capable to implement results	• Capable of leading the process • Neutral • Flexible • Alert	• Diverse • Motivated • Acknowledges importance of finding a solution
Responsibilities:	**Responsibilities:**	**Responsibilities:**
• Initial question • Sharing background • Information • Decisions about the content • Follow-up	• Process • Choosing the right techniques • Group dynamics and energy • Ensuring output is being • Reported	• Sharing Experience • Content finding • Acceptance finding

Table1. Characteristics and responsibilities of roles in creative sessions (Katrina & van der Meer, 2019)

2. Clear Problem Statement

A clear problem statement is equally crucial for creative problem-solving. The formulation of a problem impacts the techniques the resource group apply to the problem and their success in creative sessions (Ward, 2004). Besides, the other benefit of reformulating the problem is that the whole resource group's engagement would increase during the session (Mumford, 1994).

Besides, the problem statement shall be open-ended and inviting to come up with opinions(Tudor Rickards,1974). To be specific, SPARK (Specific, Positive, Ambitious, Relevant, Keep it simple) is considered the guidance to formulate the reformulated problem statement(Heijne & van der Meer, 2019).

3. Rules for Each Phase of Creative Diamond:

As a summary, the following golden rules are well known for the creative diamond as a guidance to choose the right creativity techniques(Heijne & van der Meer, 2019):

Diverging	Reverging	Converging
Postpone judgement	**Use the inquiring mind**	**Use affirmative judgement**
• Quantity breeds quality • Hitchhike • Freewheel	• Be jointly active • Listen responsively • Move circularly	• Protect originality • Trust the hedonic response • Have an action in mind

Table 2. Golden rules for each phase of creative diamond

As a summary, the relationship between three basic principles of creative facilitation is shown in the following figure: **Following the golden rules of creative problem solving, the resource group with rigid roles are motivated to approach a clear and open-ended problem.**

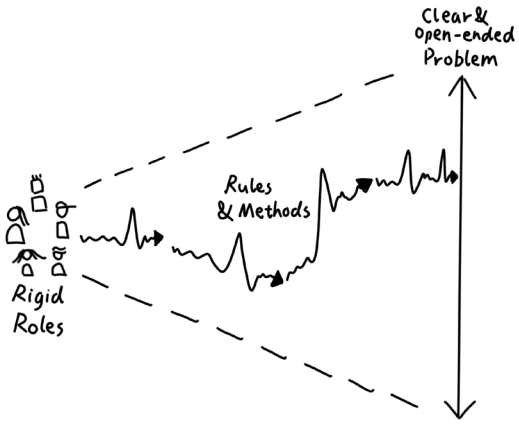


Figure 7. Relationship between three basic principles

2.1.4 Core Creativity Techniques

For several decades, diverse creativity techniques have been developed to support the creative session process. Based on the three-step creative diamond, 40 distinct creativity techniques for supporting the main three stages of iCPS are situated. The Method Selection Chart below depicts techniques in the stage where they are best suited and the family they belong to (Katrina & van der Meer, 2019):

Problem Finding

Diverging
- Making a Collage
- Flower Association
- Excursion 3:
- Hidden Presumptions
- How To's
- Ladder of Abstraction
- Mind Mapping in
- Group Sessions
- Excursion 9: Personal Analogy
- Picture the Problem
- SCAMPER
- 5W1H

Reverging
- Spontaneous Clustering
- Idea Gallery
- Sequencing

Converging
- Hits or Dots
- Restating the Problem

Idea Finding

Diverging
- Brainstorming (traditional)
- Brainwriting with Post-its
- Brainwriting 6.3.5
- Creative Confrontation
- Making a Collage
- Flower Association
- MATEC
- Morphological Synthesis
- SCAMPER
- 40 Inventive Principles
- of TRIZ
- Excursions 1-11

Reverging
- Spontaneous Clustering
- Idea Gallery
- Sequencing
- C-Box

Converging
- Hits or Dots
- Paired Comparison

Solution Finding

Diverging
- Making a Collage
- Interactive Brainsketching
- SCAMPER

Reverging
- Spontaneous Clustering
- Elevator Pitch
- Idea Gallery
- Sequencing
- SML

Converging
- Criteria & Ranking
- Making a Poster
- UALo

Table 3. Creativity techniques selection chart

2.1.5 Artifacts for Creative Session

As the carrier of iCPS theory, the facilitator and the resource group use artifacts in the creative session. An artifact is any tangible, portable object that holds information (Dave Gray, 2010). The artifacts like post-it and flip sheet, which the resource group used in the creative session, all hold unique meanings behind the surface. After understanding these meanings, more possibilities and latent knowledge could be dug out to the earth for the reimagination of the creative session.

Post-it: Node Generation

Post-it is the most common artifact in any creative session. Every post-it contains the content which is part of the large info system in the creative session. Each time the resource group write an idea on a separate post-it, they are generating a set of modular, movable information artifacts that they will later be able to shuffle, sort and recognize.

Flip Sheet: Meaningful Space

Flip sheet is the second common artifact in any creative session. It is a piece of big empty paper. Based on that, a meaning space has been created to offer the possibility of making relationships between different information artifacts (post-it). To be more abstract, the flip sheet creates a space that the whole resource group can explore together. The meaningful space creates the boundaries of an independent world, and the information artifacts (post-it) populate the world (Dave Gray, 2010).

In summary, post-it and flip sheet are both important artifacts that carry information within the large system of creative sessions. When the resource group write an idea on a post-it or move it on a flip sheet, they are already creating an information artifact. The more information the resource group and facilitators can store in material artifacts or the environment, the more their minds are free to engage with the situation at hand. Based on the summary, the graduate student proposed an assumption:

> **The design toolkit is expected to store more info related to creative sessions to relief the facilitator's and the resource group's information burden then free to engage with the creative session.**

2.1.6 Summary of Creative Session Part

In the creative session literature review part, some questions in the research plan have been partly answered:

- What's the essence for a creative session?
- What are the common creativity techniques for a creative session?

Also, more questions arise and need to be answered in the later chapter:

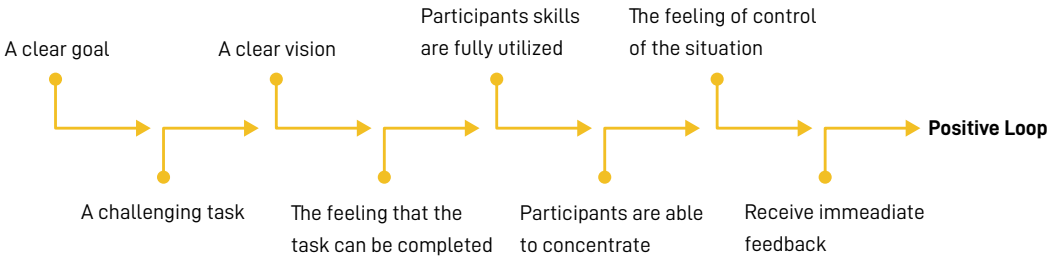
- In practice, what's a typical creative session process?
- What opportunities are there in artifacts for the creative session?

2.2 Game Experience for Creative session

2.2.1 Fun - Key Indicator for Successful Creative Session

Humor and fun foster open-minded and creative thinking. It's imperative that participants could feel engagement in the creative session process. Being engaged in a creative session is not just about paying attention. With positive emotions, participants would stimulate themselves to put more effort and energy into the creative session, which formulates a positive loop (Rich, Lepine & Crawford, 2010).

In order to formulate the positive loop, there are several requirements for the performed task (Csikszentmihalyi, 1990):



In positive psychology, the positive loop is called flow state. A flow state is the mental state of operation in which a person performing an activity is fully immersed in a feeling of energized focus, full involvement, and enjoyment in the process of the activity (Csikszentmihalyi, 1990). Jenova Chen, the game designer for Journey, creates a relation between the definition of "Fun" and "Flow State". There is a universal agreement that without a dynamic balance between the challenge of an activity and the ability to meet that challenge, fun would disappear immediately. Interestingly, making it possible for anyone to **find exactly the right amount of challenge to engage with the exact abilities is the only way** to get access to the flow state. And game is a suitable media to offer appropriate challenges for players with certain skills (Deterding, 2015). The relationship between fun and game would be elaborated in the next sections.

2.2.2 Fun of Game

Fun is desirable in nearly every game. The motivation for every human action in the game can be traced back to some kind of pleasure seeking (Schell, 2014). People easily get fun from the game. Different from ordinary life, games help them jump into a magical circle(Klabbers, J. H., 2009). In the magical circle, players are entitled more opportunities to trail and error. Eventually, they would perform bolder and more positive about what they experience(Klabbers, J. H. ,2009). While taking the challenge with the exact ability, players already get fun in the game experince.

2.2.3 Game and Creative Session

To be able to successfully integrate the game experience into creative sessions, it was relevant to understand the relationship between the game and creative session. Actually, game and creative session have already had a sort of relationship. For instance, in the creative session process, icebreaker and energizers have been proved efficient in creating a relaxed and fun atmosphere for the creative session (Naydonova, 2003). And the relaxed and playful atmosphere is exactly the key indicator of a successful creative process (Mumford & Gustafson, 1988).

Besides, the game experience can evoke a sense of familiarity (Kultima. A, 2008). In a typical creative session, the facilitator is required to put extra effort to shake participants at the start to loosen them up. While with the intervention of game experience, a relaxed and playful atmosphere is easier to achieve since it refers to the playful conventions familiar to anyone who has experience with plying games before. The sense of familiarity can help participants quicker get committed to the creative session(Kultima. A, 2015).

In summary, **the atmosphere in the session and the feeling of participants are key factors for the success of a creative session in terms of generating ideas**(Kultima, A, 2008) and a gamified creative session experience has a great potential to fulfill the two key factors. In the next section, the formulation of a complete game experience would be elaborated.

2.2.4 Game Design Elements

Basic game elements support creating a playful experience. There are diverse ways to break down and classify the essential elements that form a game experience. The author Jesse Schell came up a category of game elements, which is called Elemental Tetrad. Here is a glimpse of each element and how they relate to the others:

Mechanics: These are the procedures and rules of the game. Mechanics describe the goal of the game, how players can and cannot try to achieve it, and what happens when they try. And that's the biggest difference between a game and other linear entertainment experience like fictions, movies, etc.

Story: This is the sequence of events that uncovers in the game. It may be linear and pre-scripted to one direction, or it may be branching and emergent to diverse directions. The story can help players quickly jump into a new world (or call it magical circle) and get accustomed to it immediately.

Aesthetics: This is how the game looks, sounds, smells, tastes, and feels to the players. Aesthetics are an incredibly important component of game design since they bring the most intuitive feeling to the players.

Technology: This word doesn't exclusively mean "high technology" here, but to any materials and interactions that make the play possible such as paper and pencil or high-powered lasers. The chosen technology enables the game to better do certain things but also prohibit from doing other things.

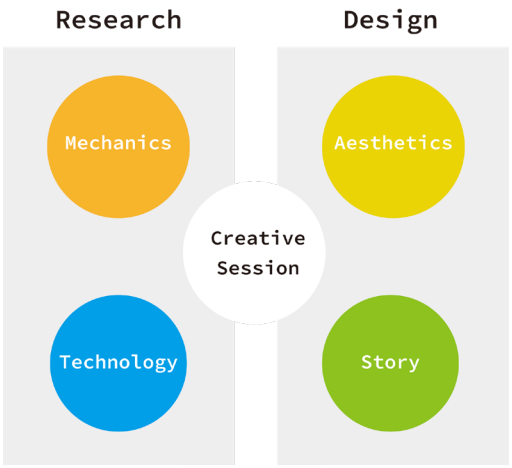


Figure 8. Game elements in different phases

Taking the characteristics of each game element into account, mechanics and technology are mainly explored and discussed in the research phase. Meanwhile, story and aesthetics later intervene in the design phase.

2.2.5 The Bridge - Gamification

Between games and creative sessions, there exists the gap that games are played in a virtual world, while creative sessions happen in a real context. And the bridge to make up the gap is the gamification methodology. Gamification is often described as "**the use of game design elements in non-game contexts**" (Deterding, 2011). To be specific, the game elements like points, levels, leaderboards, achievements, and badges are extracted from the game to apply to the real context where game experiences normally don't exist (Nicholson, S, 2015).

Most gamification systems use rewards to motivate people in the real world. Reward systems do work as long as the player's points increase, the level goes up, ranking the top, achieving achievements, or obtaining badges. However, these rewards can merely be seen as **extrinsic motivations**. Once the reward system stops, the expected behavior would also hardly continue unless new extrinsic motivations intervene. So how to continue a behavior without an external reward becomes crucial.

The drive to do something without an external reward is known as **intrinsic motivation** (Deci & Ryan, 2004). Performing tasks for intrinsic reasons puts someone in a more healthy mental state than performing tasks for extrinsic rewards. Except for providing external rewards for continuing a behavior, some internal reasons could be dug up for engaging with the behavior. The theory behind it is put forward by Deci and Ryan. It states that the intrinsic motivation is a combination of three psychological needs: competence, autonomy, and relatedness.

Competence

Competence is when participants feel that they have got enough capability to make a difference in the world.

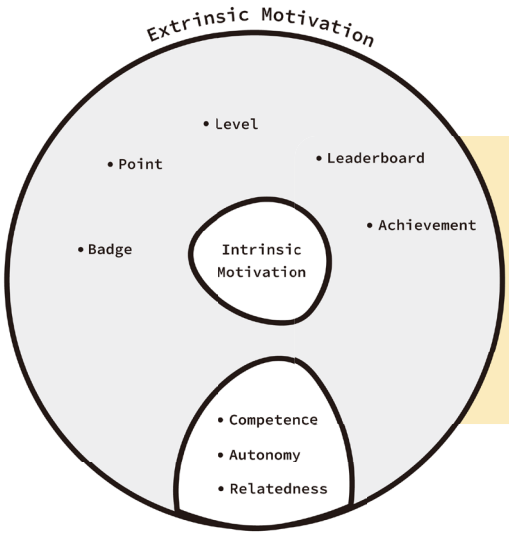
Autonomy

Autonomy is experienced by participants when the behaviors that they engage in matches their own sense of who they are. And they have the control of making their own decisions about behavior to a certain extent.

Relatedness

Relatedness is based on the connections that an individual participant feels with others through their behaviors.

Intrinsic motivation is the construct that combines these three psychological needs of competence, autonomy, and relatedness. The following image presents the relationship between extrinsic motivation and intrinsic motivations.



To help the resource group in the creative session find their own reasons for engaging with the session, the main focus would be put on building intrinsic motivations for the resource group. And the components in the extrinsic motivations like point, level, leaderboard, achievement and badge would function as amplifiers to magnify intrinsic motivations.

Figure 9. Relationship between intrinsic motivation and extrinsic motivation

Then... How to evoke intrinsic motivations?

Behind this question, there is the method: "**The lens of intrinsic skill atoms**" put forward by Sebastian Deterding. The method sees a gamification design as "a system in which inherent challenges are nested into feedback loops of goals, actions, objects, rules and performance feedback that afford motivating experiences."

A skill atom describes a feedback loop between user and system that is organized around a central challenge: within the intrinsic motivation, a user takes action, which forms an input into the 'system's rule system, then forms an output as feedback to the user. Based on this method, the game experience aimed at evoking intrinsic motivations was build in chapter 6.3.

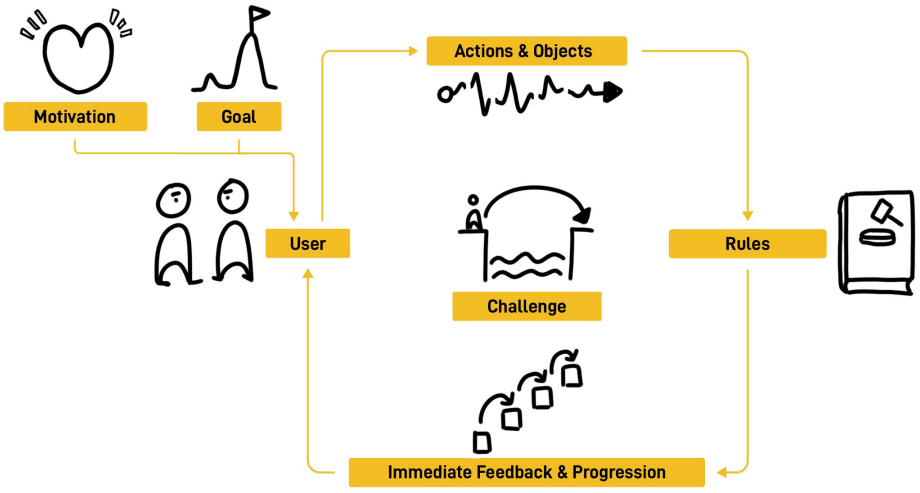


Figure 10. Relationship between intrinsic motivation and extrinsic motivation

2.2.6 Game Types for Creative Session

Types of games are diverse, and on earth which one type is appropriate for the format of creative sessions? Instead of classifying games by flatforms or gameplay, the game designer Schell distinguish games by the places in lives that people play. He preferred to call these venues. And here is the graph that includes different game venues.

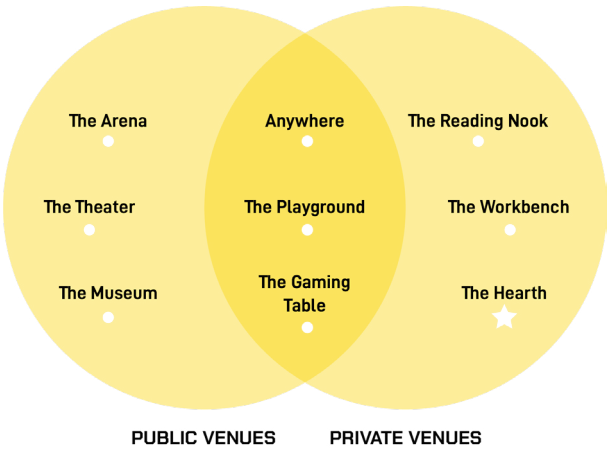


Figure 11. Types of games (Schell, 2015)

Considering that the creative session is a local multiplayer activity, **the hearth game** is most appropriate. The hearth is the place surrounded by several people. Tending a fire was an around-the-clock responsibility, making families and large social groups more important than ever. In most modern homes, the TV screen has replaced the fireplace. And it makes a pretty good substitute. The hearth works best for games that can entertain multiple people, either by letting them play together or by being fun to watch (Schell. J, 2014).

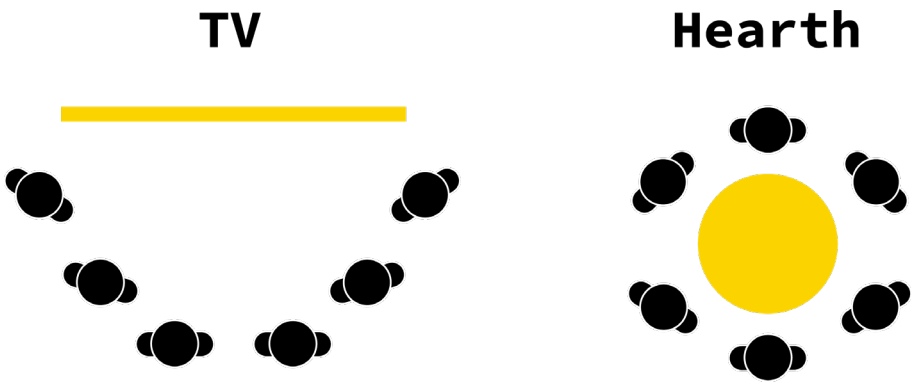
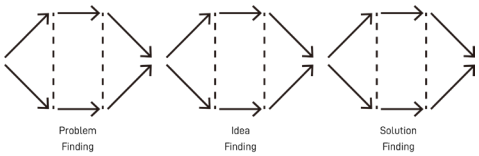


Figure 12. Two formats of the hearth game

In modern families, the TV screen has replaced the fireplace. And it makes a pretty good substitute. It's the right size, it gives light in the darkness, it flickers in a similar way, and instead of relying on family members to entertain each other by telling stories, this modern fire tells its own stories (Schell. J, 2014). Connected with the previous research on chapter 2.1.5 artifacts for the creative session, the TV screen has great potential to function as the extension of meaningful space to store more information.

2.3 Key Take-Aways Chapter 2

3 Creative Diamonds

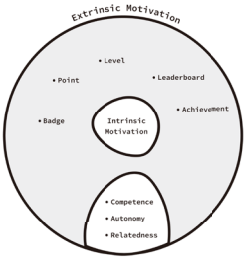


The process of creative session shall follow the 3 creative diamonds: Problem Finding, Idea Finding and Solution Finding

Basic Design Elements

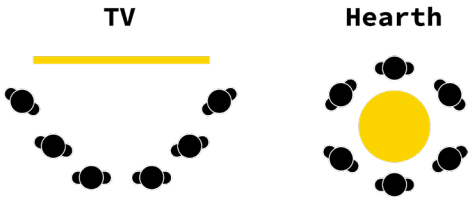
The basic game elements: story, mechanics, technology and aesthetics would be the guideline for later research and design focus

Intrinsic Motivation



To help the resource group in the creative session find their own reasons for engaging with the session, the main focus would be put on building intrinsic motivations for the resource group

Extention of Meaningful Space



TV has the great potential to act as the extension of meaningful space to store external information in the hearth game

3. Explorative Research

In this chapter

In this chapter, explorative research was conducted to answer research questions and gather (de)motivating factors as support for the later design. Based on the factors, an initial research conclusion was proposed.

Before the explorative research, there are several questions that expect to be answered based on the research plan in chapter 1.2.2:

- What opportunities are there in the current creative session?
- What's the charateristic of the target group?
- What are the common creativity techniques for a creative session?
- What are the opportunities for the current creative session from a future perspective?

3.1 Research Setup

The theoretical background study provides insights into the relationship between creative sessions and games. In order to refine the theoretical insights and include a practical viewpoint, exploratory research was conducted.

In this graduation project, a focus is given to the creative session practice. Therefore three practices were performed. The first practice is observation research to acquire an understanding of the real creative session context. The second practice is the questionnaire designed for obtaining (de)motivating factors form the people who both have the experience as facilitators and resource group. The third practice focuses on &RANJ's creative session to define the problem scope and target group.

Besides, technology research was also conducted to explore possibilities of combining creative session with interactive media to broaden the boundary.

Several (de)motivating factors were collected during the whole explorative research. These factors were mainly classified as 4 types for later analysis:

Opportunity : A desired situation can be imagined on that

Problem : Unsatisfied current situation

Insight : Rough ideas for the current situation

Emotion : The real feeling of the resource group

3.2 Creative Session in Practice

To obtain knowledge for the real context of the creative session, the graduate student joined the course "Creative Facilitation " by Professor Han van der Meer and Katrina Heijne and conducted observation research during the course.

3.2.1 Goals

The main goal of this observation research includes:

1. Identify the common process of a creative session.
2. Learn the core creativity techniques for creative facilitation.

3.2.2 Approach

In one week, the graduate student joined several sessions facilitated by the TU Delft student. In every session, the graduate student memorized the creativity techniques applied in this session. And notes were taken on the notebook after the session.

Figure 13. Process of ideation

Figure 14. Process of clustering ideas

3.2.3 Result - Common Process of Creative Session

From the finding in last chapter Theoretical Background, a creative problem solving process is made up of 3 creative diamonds: problem finding, idea finding, solution finding. And each creative diamond includes 3 stages: diverging, reverging and converging. And this creative problem solving process is an ideal framework with sufficient resources and time. It still needs further adjustments to cope with different durations of creative sessions.

After one week of observation research, a common creative session process with a duration of around 2 hours is clarified:

Introduction > Redefine Problem > Diverging > Reverging > Converging > Wrap Up & Closing

Among them, Redefine Problem, Diverging, Reverging and Converging stage are the 4 most essential phases for the creative session. Here is the graph that shows the transition from an ideal creative problem solving process to a common creative session with a duration of 2 hours:

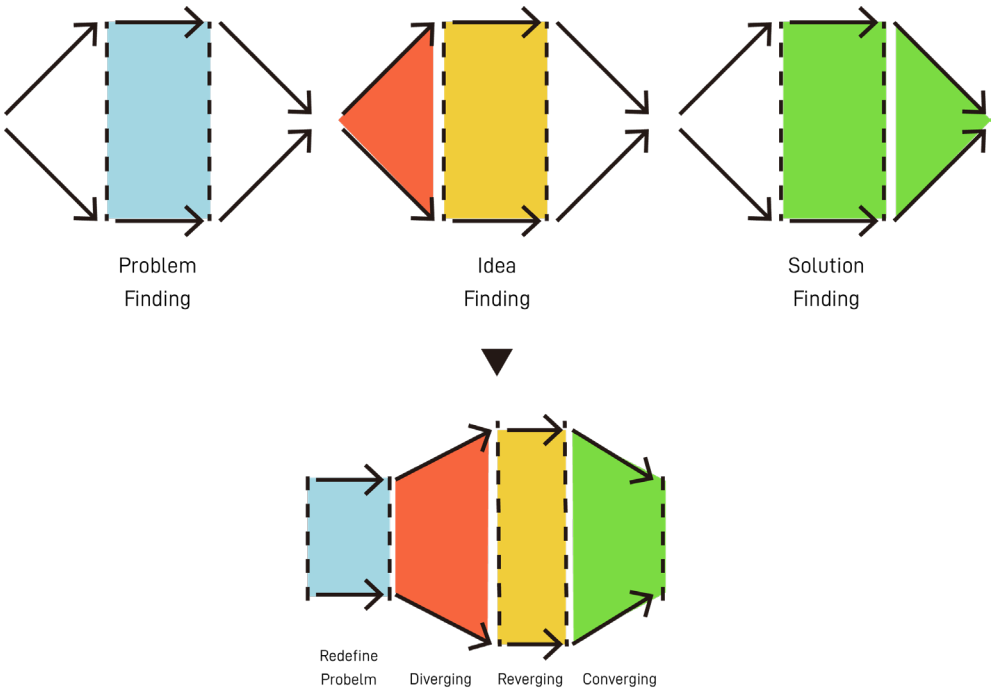


Figure 15. Process of creative session (2 hours)

3.2.4 Result - Common Creativity Techniques

In the chapter 2.1.4 Core Creativity Techniques, there are around 40 methods for different phases in creations. Acccording to this fact, there come out two main potential design directions:

1. To design a tool that organizes most of creativity techniques in a playful way
2. To design a game that focuses on several specific creativity techniques in a playful way

According to the chapter 2.2.5 Gamification, focus are decided to concentrate on stimulating the resource group's intrinsic motivation. While applying the method "The lens of intrinsic skill atoms" to the toolkit design, the specific content of the creativity technique shall be taken into account. Therefore, in order to evoke participants' intrinsic motivation, the graduate student chose the second design direction to deeply gamify several frequently-used creativity techniques. Meanwhile, during the observation research, some creativity techniques popped out as the most common and efficient techniques the facilitators have applied. The table below indicates that:

Redefine Problem	Diverging	Reverging	Converging
• 5W1H • 5WHY • Lego Play • Ladder of Abstration	• The Anti - Problem • Random Stimuli • Trigger Card • Criminal Round	• Spontaneous Clustering • C - Box	• Dot Voting • SCAMPER • UALo

Table 4. List of common creativity techniques

3.3 Questionnaire for Creative Session

In order to get a holistic overview of opportunities hidden in the process of creative sessions, the questionnaire was made for collecting (de)motivating factors related to creative sessions. The participants in this practice are the Creative Facilitation course students who have both experience of facilitation and also the resource group.

3.3.1 Goals

1. Identify the common process of a creative session.
2. Learn the core creativity techniques for creative facilitation.

3.3.2 Approach

In order to get real detail about creative sessions from participants, a conversational questionnaire was designed to try to help arouse participants' memory and emotion at the time of taking part in creative sessions.

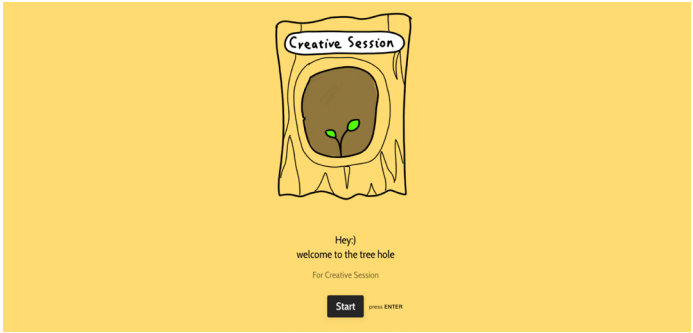


Figure 16. Cover of the questionnaire

3.3.3 Analysis

This practice includes quantitative research and qualitative research. In quantitative research, participants were asked to answer two main questions:

"In which phase do you feel most confident and most frustrated respectively as a facilitator? "

"In which phase do you feel most awesome and most unsatisfied respectively as the resource group? "

The answers from participants were collected to draw the emotion curves for both facilitators and the resource group. Continuing with the two main questions, qualitative research was conducted. The participants were asked to answer the reason behind the two main questions and more other questions related to that.

3.3.4 Results

The Emotion Curve for Facilitators

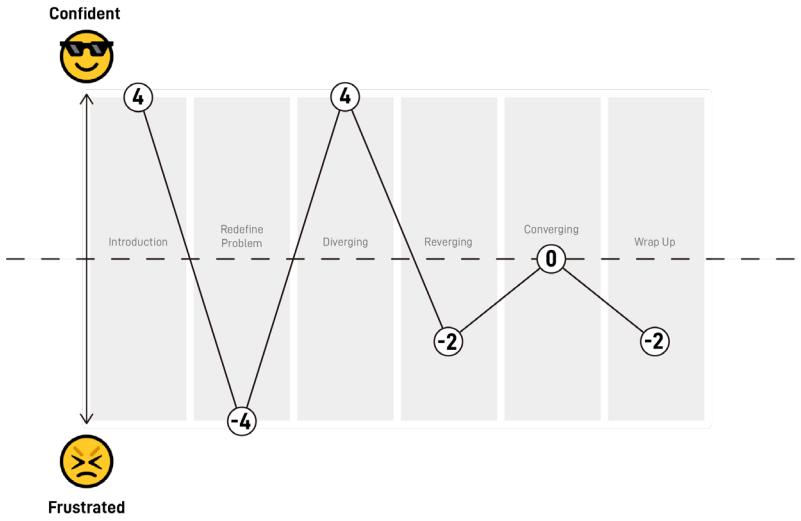


Figure 17. The emotion curve for facilitators

Introduction 4

4 facilitators felt confident at this phase. Ice-breaker is always used to open up for resource groups. The main goal of this phase is to let people know each other a little bit like avoiding the awkwardness in the group and know the rules of the session.

Redefine 4

4 facilitators felt frustrated at this phase. They found it hard to guide the resource group to the right level of the problem. And this phase always spend time more than expected.

Diverging 4

4 facilitators felt confident at this phase. They used some stimuli to inspire the resource group and it always worked. But there is a problem that sometimes resource groups tend to diverge so much and hard to pull it back.

Reverging

2

2 facilitators felt unsatisfied at this phase. They expected the resource group to cluster ideas themselves, but usually it took a long time. While the resource group is creating the overview of their ideas, the facilitators felt like they are losing the overview because they are not participating in the process. They are more focussed on the activity, time management and participation than on the content. By having less understanding of the content, they feel less capable to lead the group in the right way.

Converging

0

At this phase the usual techniques are dot voting and matrix. And facilitators don't feel stressed in the process but are concerned about the quality of ideas. And finally clients tend to choose the safest and less exciting idea.

Wrap Up

2

2 facilitators felt unsatisfied at this phase. Facilitators felt stressed to make an agreement with clients for the continuation.

The Emotion Curve for Resource Group

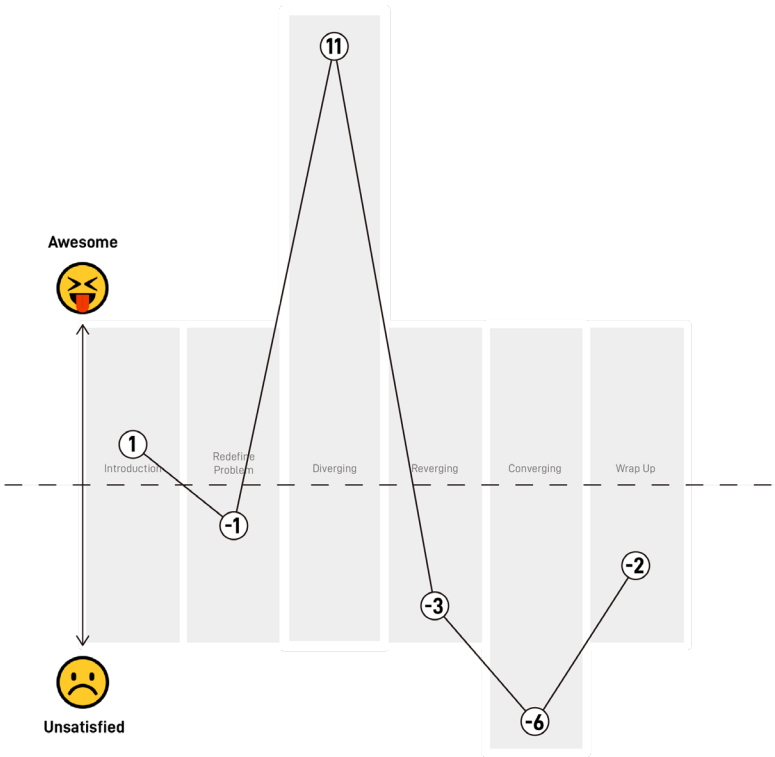


Figure 18. The emotion curve for resource group

Introduction

1

Most of resource group want to know about the subject and want some warm up to get into the session.

Redefine

1

Some resource group felt sort of unsatisfied at this phase. They don't care so much about this phase but it's also hard to come to get an agreement at the end.

Diverging

11

Most resource group felt really cool to come up with very creative ideas and felt the creative flow in a group. They could think without any consequence.

Reverging

3

3 resource group were unsatisfied with the reverging phase. Because it's tough to cluster and it takes a lot of time but the added value is not clear.

Converging

6

At this phase, the resource group had a strong feeling that all of the ideas before were going to disappear and not be used anymore("kill your darlings"). Sometimes incorrect solutions were chosen to pursue, without introvert people's concerns being heard. Also there was never a fair amount of time to really work out a concept.

Wrap Up

2

When the random ideas came together in a solution, recourse groups felt some accomplishment and also new inspiration to improve that solution.Some resource group have the feeling that the enthusiastic vibe and the motivation for new ideas is lost directly after a session.

(De)motivating Factors

Based on the results of questionnaire for creative session, several (de)motivating factors are collected:

Opportunity	At diverging phase, resource groups are still boosting and are not willing to converge
Opportunity	At reverging phase, facilitators felt losing the overview because of not participating in the process
Opportunity	Facilitators felt the heaviest workload at reverging phase
Opportunity	Introvert and extrovert people shall be given equal chance to speak loud.
Opportunity	The enthusiastic vibe and motivations for new ideas suddenly disappearred after the session
Problem	At redefine problem phase, find the right level of depth of the problem is hard
Problem	At redefine problem phase, it is hard to come to an agreement
Problem	At wrap up phase, the final idea developed by resource group was hard for later game development
Problem	There was never a fair amount of time to really work out a concept at final phase
Insight	At redefine problem phase, tangible way(lego) is a good method to describe the problem
Emotion	At introduction phase, create a sense of safety by clear rules and introduction with each other
Emotion	At reverging phase, there is a feeling of uncertainty: will something useful come out?

3.4 Interview at &RANJ

After having a holistic overview of opportunities hidden behind the creative session, more focus were put on &RANJ's creative session to find more specific opportunities and have a better understanding of the target group - clients.

3.4.1 Goals

1. Have a better understanding of &RANJ's creative sessions compared to ordinary creative sessions
2. Support defining problem scope and target group

3.4.2 Approach

Several questions were discussed via the semi-structured interview. The interview falls into two parts.

1. The questions in the first part were mostly aimed at gathering general information about creative sessions organized at &RANJ.
2. In the second part, the questions came to be more detailed about the specific process of &RANJ's creative session. Under the visual guidance of a typical creative session process, participants shared their experience as facilitators and participants respectively about the shining points, pitfalls and emotion change they have encountered in the creative session organized at &RANJ.

Name	Job	Expereince
Interviewee 1	Creative Director	Facilitator / Participant
Interviewee 2	Game Designer	Facilitator / Participant
Interviewee 3	Game Designer	Facilitator / Participant

Table 5. List of interviewees

3.4.3 Data Analysis

All the interviews were recorded and later transcripted by the graduate student. The data from all the interviewees were analyzed here. There are two main phases for the data analysis:

Phase 1: Quotes Selection and Interpretation

During the interviews, participants stated their thoughts and feelings when they were asked concerning their experience of being involved in the creative sessions. Their quotes indicate their reflections and emotion in their mind.

Phase 2: (De)motivational factors integration

During the interviews, participants explained what motivates or demotivates them in the creative session as both facilitators and participants. And all these factors were situated on the related phase of creative sessions.

Figure 19. Process of interview

3.4.4 Results

According to three rounds of interviews， summary of results is shown as follows:

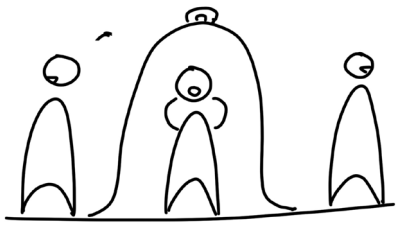
Composition of Resource Group

At the initial phase of &RANJ's project procedure, they would invite the client to join a creative session for coming up with ideas together. If possible, SME(a subject-matter expert) and end-users would also be invited. It is particularly valuable if involving people who are not experienced with creative sessions but related to the project.

Relevant Quote

"We would have game designers, and let's say the business owner and a subject-matter expert named SME. And if possible, end users would also be involved."

Positioning of Non-designers

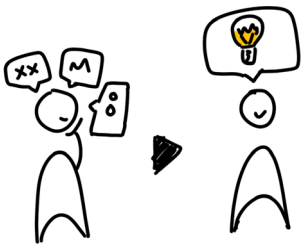


For a creative session, it is particularly valuable to involve people who are not experienced with creative sessions but related to the project. These non-designers know a lot about the project, and they can make the idea fit better for the real context. But for them, it's hard to jump out of their own identity and fully exhibit their abilities and potential.

Relevant Quote

"Sometimes you feel you could be more efficient maybe just with a group of more creative game designers. but we don't have the knowledge about the subject. Sometimes it's really hard to think of things you just don't know without people who have the knowledge."

Ideas instead of Terms

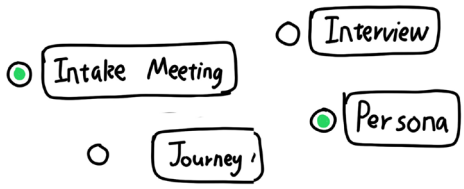


For the resource group who don't have a background of design, they hardly think of solutions but abstract terms like feelings or norms. And these broad ideas are hard to translate to solutions which can be developed after the session.

Relevant Quote

"People don't think solutions, but more in abstract terms."

Flexible Problem Definition



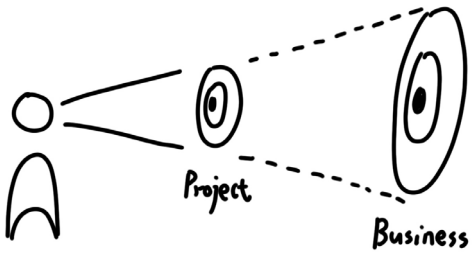
In a typical creative session, in order to define the problem, the facilitator is expected to connect with problem owner in their first meeting so-called intake meeting to perform his task appraisal for the project management process. In the later creative session, the facilitator would schedule a period redefining the problem with resource group to determine the problem as perceived.

However in &RANJ, their problem definition process is flexible. Depending on the budget and what the problem it is, they would shorten or extend this process by combining intake meetings and creative sessions together or conducitng explorative research (interview, journey map, personas) before the session.

Relevant Quote

"It's more usual for us to collect some insights from the research itself and this process doesn't necessarily done again in a creative session. But it's more valuable for us to indicate that we tend to always listen to the problem the client has, and then try to redefine."

Objectives of Creative Session in &Ranj



There are two different levels of objectives for &RANJ's creative sessions:

On the **project** level, it aims to utilize the creativity of the group to define the problem, collect diverse ideas and formulate valuable insights for the better game design delivery at the end;

On the **business** level, it's also imperative to involve clients in the creative session to make them part of the project. In the process, clients are expected to have feelings of control to the project and acknowledge the professional strength of &RANJ.

Relevant Quote

" For the creative session, there is a tangible output for the project to have good ideas in the end but there is also an intangible output for the client to have a good experience in the session."

(De)motivating Factors

Based on the results of interview at &RANJ, several (de)motivating factors are collected:

Opportunity Non-designers like clients, SME or end users are the essential part of creative sessions but they are not fully into the session now.

Opportunity Stimulate resource groups to come up with ideas instead of terms.

Opportunity For clients it's hard for them to jump out of their own profession.

Opportunity Except for the result, offer a good experience for the clients is also essential.

Problem The input problem at redefine problem phase is not stable.

Insight Offer clients sense of control to help them better into the session

3.5 Tech Boost for Creative Session

According to the project scope, this graduation project is a future-oriented project and aspires to explore new possibilities of creative sessions. Therefore technical possibilities shall be explored to combine with current creative sessions.

This section is divided into three parts. The first part indicates the trend of digitization in the collaborative working domain. The second part shows how tangible technology breaks the borderline between the digital and physical world. The third part elaborates the notion of hybrid playful experience which is exactly the intersection of the three major domains related to the graduate project: creative session, game and technology.

3.5.1 Digitization of Collaborative Working

Within the tide of the digital information age, the format of the current collaborative working domain has been developed variously from physical to digital, from offline to online. As a part of the collaborative working domain, creative session have the potential to be improved from inspirations of other products in this domain.

Therefore, the graduate student made a case study regarding 4 products in the collaborative working domain: **Nureva Wall, Hololens 2, Stormz** and **Miro**. The detailed study can be seen in appendix .

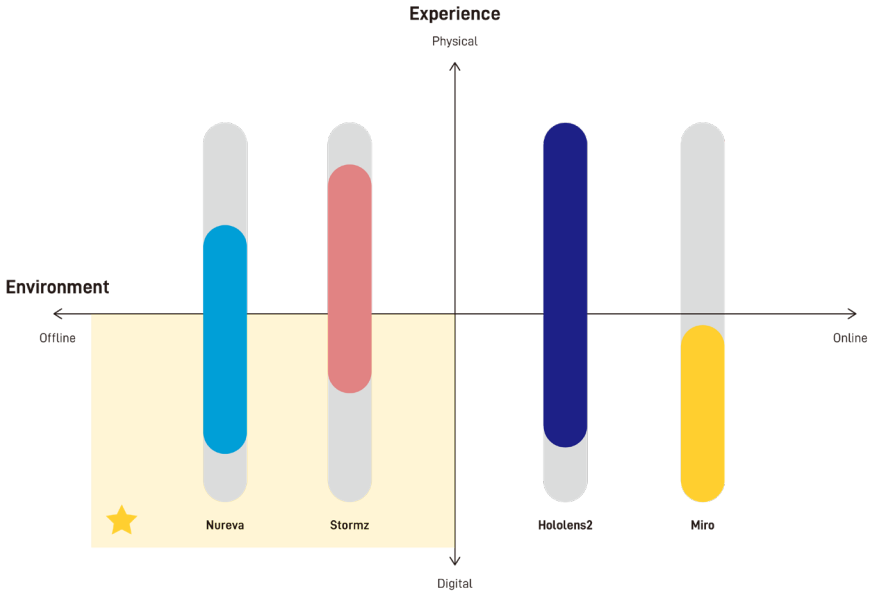


Figure 20. Different extents of digitization to collaborative working domain

Here is the matrix within these four products or services designed for collaborative working. The horizontal axis shows the environment from offline to online, the vertical axis shows the experience from digital to physical. Considering that the target session is the complete offline activity, the most focus is expected to put on the digital offline quadrant. The factors collected in this section could be used for later design.

3.5.2 The Bridge - Tangible Technology

Considering the trend of digitalization in the collaborative working domain and the inherent physical attribute of creative sessions, tangible technology is a suitable bridge in the middle to connect between physical and digital contents.

Tangible technology is the technology that blurs the divide between the physical and digital worlds(Villar, N, 2018). While people interact with physical objects, their actions would come alive on the digital screen. These natural ways of manipulating the world open up a world of possibilities in terms of how people can play, learn and interact between the physical and digital world.

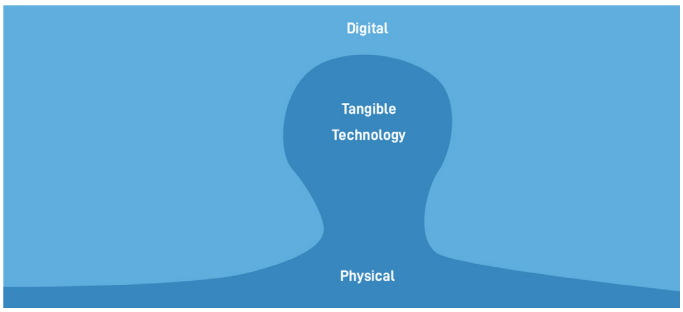


Figure 21. Positioning of tangible technology

From the technology perspective, in tangible technology the most crucial part is how the digital screen senses the physical interactions. Therefore the graduate student did pervasive research to find available technology which has existed in the market and have the potential to be applied to the design phase.

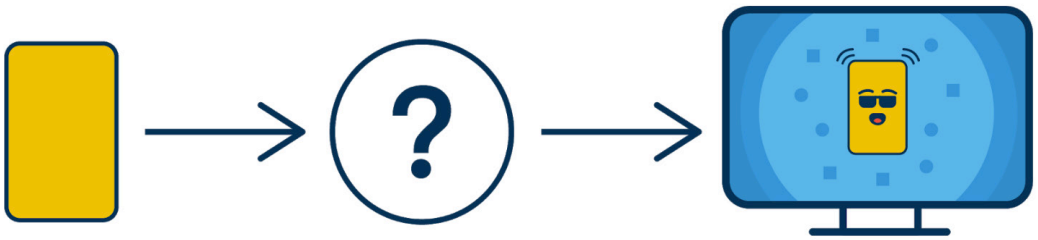


Figure 22. Positioning of tangible technology

In order to answer the above question, several solutions have been selected fror analysis. The selection criteria are based on the tech difficulty, function, and sensing distance. The detailed introduction of these solutions is shown in appendix D.

Here is a summary of all selected solutions. In the design phase, some of these solutions were applied and tested to determine if they were suitable for this project considering the effect, time and cost. In order to create a complete game experience within creative sessions, the solution with low tech difficulty and high sensibility would be taken into consideration at first. Based on this consideration, **Joy-Cons** were chosen as the feasible soulations for the later design.

Solution	Tech Difficulty	Sensing Distance	Function
QR code scanning	Low	Far	– Scan info in QR code
I2C Color Sensor	Low	Very Close	– Detect color
RFID / NFC Module	Low	Close	– Sense info saved in the NFC tag
OpenMV Cam M7	High	Moderate	– Motion detection – Tag tracking
Pixy 2 CMUcam5	Medium	Moderate	– Multi-object recognition – Multi-color recognition
ARKit2	Low	Very Close	– Image Detection
⭐ **Joy-cons**	Low	Any	– Wireless button

Table 6. Summary of all selected solutions

3.5.3 Hybrid Playful Experience

The notion hybrid playful experience was firstly proposed by Kultima A, which means the application of tangible technology in game and toy domains. Digital information and capabilities can be embedded in everyday objects and physical environments (Ishii, H, 1997). And within the tangible technology development, hybrid playful experience comes out. And the experience is ideally situated in the intersection points between creative session, game and technology.

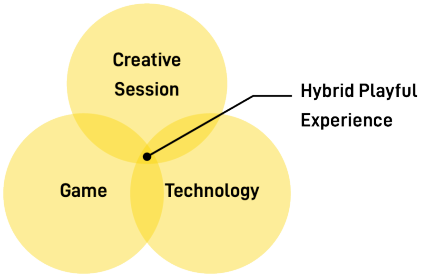


Figure 23. Positioning of hybrid playful experience

One benefit of hybrid playful experience is that the dynamic and smart capabilities of computer software, sensors and networks provide in principle limitless opportunities for transforming the mute, physical object into something that can sense, react and invite to rich, playful interactions. Therefore, an envision of future creative session is formulated by the graduate student.

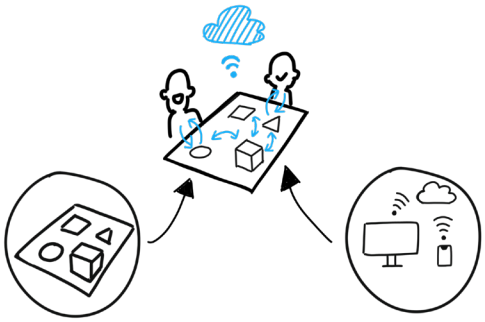


Figure 24. Envision of future creative session

(De)motivating Factors

Based on the results of all three practices in technology research, several (de)motivating factors are collected:

Opportunity Cellphone as the new artifact of node generation and touch screen as the new artifact of meaningful space.

Opportunity More playful interactions and visual feedback can increase resource group's enthusiasm

Opportunity External resources from the internet to help make associations

Opportunity Visual clues to evidently distinguish different clusters

Opportunity Instant team member action feedback to improve the sense of teamwork

Insight Design a system for facilitators to customize their own session flow via provided templates

Insight Digital information are presented by playful physical interactions

3.6 Factors Glimpse

Considering if the factor has an impact on a specific phase in the creative sessionor on the whole process, all the factors collected from the explorative research are put into its appropriate position. Here is an overview list of the factors and the complete one can be seen in appendix E.

Introduction	*Redefine Problem*	*Diverging*	*Reverging*	*Converging*	*Wrap UP Closing*	*Whole Session*
						Insight
						Insight
	Insight		Emotion			Insight
	Opportunity	Opportunity	Opportunity			Opportunity
	Problem	Opportunity	Opportunity	Opportunity		Opportunity
	Problem	Opportunity	Opportunity	Opportunity	Opportunity	Opportunity
Emotion	Problem	Opportunity	Opportunity	Problem	Problem	Opportunity

Table 7. Overview of factors distribution

3.7 Research Conclusion

By reviewing all the factors collected by 3 practices in the exploratory research, some factors were selected to determine a promising design direction under the problem as perceived. Now the problem as perceived is clarified: How to involve participants with diverse backgrounds being fully committed to a creative session in a playful manner?

The decision process is not total logic and made based on the intuition and current design experience. The following image indicates the problem as perceived and the insights which support the design direction.

Problem as Perceived

How to involve participants with diverse backgrounds being fully committed to a creative session in a playful manner?

Introduction	Redefine Problem	Diverging	Reverging	Converging	Wrap UP Closing
Feel important Let non-designers feel they are essential	**Right Depth** Find right level of depth of the problem	**Quantity** Quantity breeds quality	**Have Overview** Have an overview of all ideas	**Continue Iterating** Don't just end after choosing ideas	**Satisfied** Feel satisfied with the end result
Jump out Jump out of their own profession	**Agreement** Try to get an agreement	**Hitchhike**	**Visual Clues** Visual Clues to evidently distinuish differnt clusters	**Democratic** Don't just let one make the decision	
Team Building Increase collaboration	**Tangible** Use tangible interaction	**Freewheel**	**Democratic** Don't just let one make the decision		
Clear Rule Have an explicit expectation					

Insights Applied to Whole Process

Speak Out Equally
Equal chance to speak out for both extrovert and introvert people

Structure of Play
Use step by step game components guidance to help come up with game ideas

Time Management
Better time management to control the rhythm of sessions

Good Experience
Except for the result, offer a good experience for the clients is also essencial

Intrinsic Motivation
Design for intrinsic motivations instead of extrinsic ones

Sense of Control
Offer clients sense of control to help them better into the session

Feedback
More playful interactions and visual feedback can increase RG's enthusiam

Digital Info
Digital info are presented by playful physical interactions

Emotion Journey


Sense of Teamwork


Sense of Dive


Sense of Stimulation

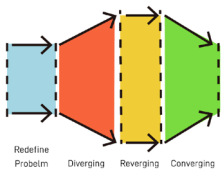

Sense of Navigation


Sense of Harmony


Sense of Accomplishment

3.8 Key Take-Aways Chapter 3

Creative Session Process in Practice



In the observation research, a creative session process in practice for short term is determined: redefine problem, diverging, reverging, and converging are the main stages in the creative session process

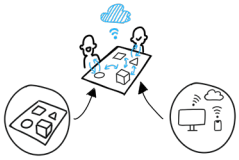
Core Frequently-Used Creativity Techniques

From the observation research, some creativity techniques popped out as the most common and efficient techniques the facilitators have applied.

Define Target Group

Based on the interview with game designers at &RANJ, the target group are defined as participants with diverse backgrounds, especially clients who are expected to jump out of their own profession circle and better recognize the value of gamification.

Digital Interaction Intervention



From the tech research for the creative session, although currently creative session is a total physical activity, there is a great potential that digital intervention can help improve the current creative session experience.

4. Synthesis

In this chapter

In this chapter, it starts to bridge the gap from a research result to a design concept. The design direction obtained in the last chapter is further narrowed down to a clear target wth desired intrinsic motivations for the later deisgn.

4.1 Design Direction

This part starts to clarify the layers from a design direction to a design focus for the next phase of ideation and conceptualization. Some insights have been proposed in the last chapter to support the design direction. And the direction still needs to be narrowed down as a design focus with clear requirements.

At the end of last chaper, the design direction (problem as perceived) is determined:

How to involve participants with diverse backgrounds being fully committed to a creative session in a playful manner?

But the phrase "fully committed" is still broad and abstract. It needs to be explained more. Instead of only one directional taking in or out, we aspire the non-designer patticipants can keep the balance between input and output in creative sessions. According to the findings of the research phase, the definition of being fully committed is elaborated in the following figure:

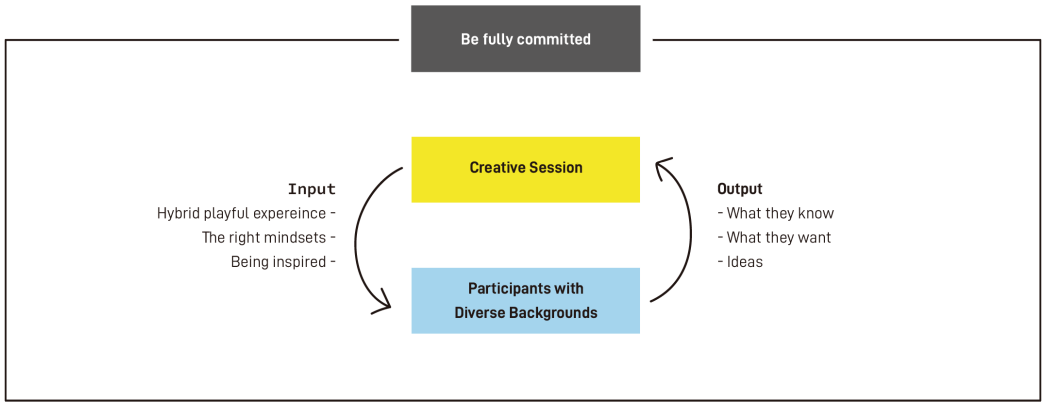


Figure 25. Definition of being fully committed

The state of being fully committed to the creative session for non-designer participants includes two parts: input part and output part. For the input part, the participants can get immerse more into the session by having a playful experience to be inspired and keep suitable mindsets in different phases. For the output phase, the participants can share what they know and what they want about the problem, then come up with their own ideas. The balance between the input and the output can better help participants get into the flow state which is mentioned in chapter 2.2.1.

But...Specifically?

Now the definition of "fully committed" is clarified, but the design direction is still vague. The gap exists between the direction and the design criteria.

Connected with what learned in chapter Theoretical Background, in order to let players step into the positive loop of fun, a desired intrinsic motivation needs to be assured first.

To sum up, the key question is proposed:

What's the main intrinsic motivation to drive non-designer participants fully committed to the creative session?

4.2 Design Focus

Under the key question, the intrinsic motivation for non-designer participants is determined: **fun collaborative autonomy**. The three keywords in the intrinsic motivation statement are summarized base on the findings in the previous research phase.

Fun

According to the theoretical background, Fun is the core value of the game and fun is also essential in creative sessions. With the intervention of game experience, particiapnts are expected to get immersive into the session thus getting into the flow state.

Collaborative

According to the explorative research, building a connection between clients and designers is a primary goal at &RANJ's creative sessions. Instead of competition, collaboration can better boost understanding between non-designers and designers. Aside from that, from the perspective of the session itself, collaboration can improve group dynamics, and from a commercial perspective, the good relationship between &RANJ and clients can Increase opportunities for future cooperation.

Autonomy

The need for autonomy is the insight the graduate student obtained from the interview with &RANJ's game designers. Clients didn't have the motivation to join a session and thought it shall be the business of designers. Besides, they found it hard to get off their professional identity and felt embarrassed when doing what they were not good at. The clients' current extent of participation is poor. Therefore, autonomy is crucially needed to get involved in non-designer participants like clients actively.

A figure involving the design direction and the design focus is indicated below:

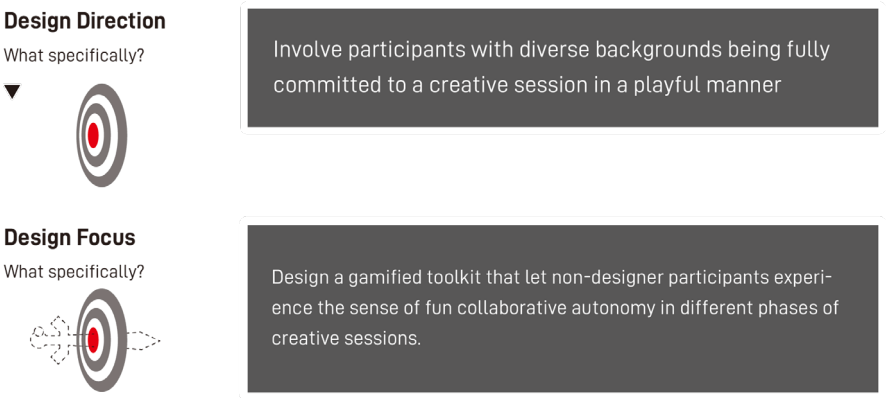


Figure 26. Design direction and design focus

4.3 Design Criteria

Based on the deisgn focus, more insights in the research phase are included in the framework of the design focus to formulate the design critera. This design criteria acts as a guideline for the next design phase.

Focus	Demand	Wish
Fun	• Participants should be get more immersive to the session	• The design can offer plenty of playful feedbacks
	• The design should entertain multi players	• The design can offer frequent interactions between players
	• The design should offer a complete game expereince	• The design can offer players suitable challenges with exact skills
Collaborative	• The design should increase the connection between participants	• The design can offer the chance to discuss together
	• The design should make it easier to get an agreement between participants	• The design can offer the chance to accomplish a goal together
Autonomy	• The design should help participants jump out of their profesional identity	• New roles could be assigned to participants
	• The design should give participants the sense of ownership	• Partipants could make their own decisions with equal chance
	• The design should give active space for participants instead of merely following instructions	• Partipants could control the progress of the process actively

Table 8. List of design criteria

5. Ideation for Design Elements

In this chapter

This chapter describes the ideation process for design elements. Design elements were validated and collected using creativity techniques during multiple creative sessions.

5.1 Introduction

Considering the diverse requirements in different phases of creative sessions, it's hard to come up with ideas instantly coping with the whole creative session process. Therefore, in this ideation phase, the most focus was put on generating design elements that contribute to fulfilling part requirements in creative sessions. Then in the next conceptualization phase, these design elements were integrated into complete concepts.

Two creative sessions were hosted in the ideation phase. Aside from generating design elements in both sessions for the next conceptualization phase.Via these two sessions, the graduate student also tested some potential design elements which already popped out in the research phase.

The first session focused on envisioning the future creative session with various media. Participants were selected among people who are familiar with the process of creative sessions and creative enough to envision the future. The second session focused on how to involve non-designer participants like clients into creative sessions to better collaborate with designers. Participants were selected among &RANJ's game designers who know clients well:)

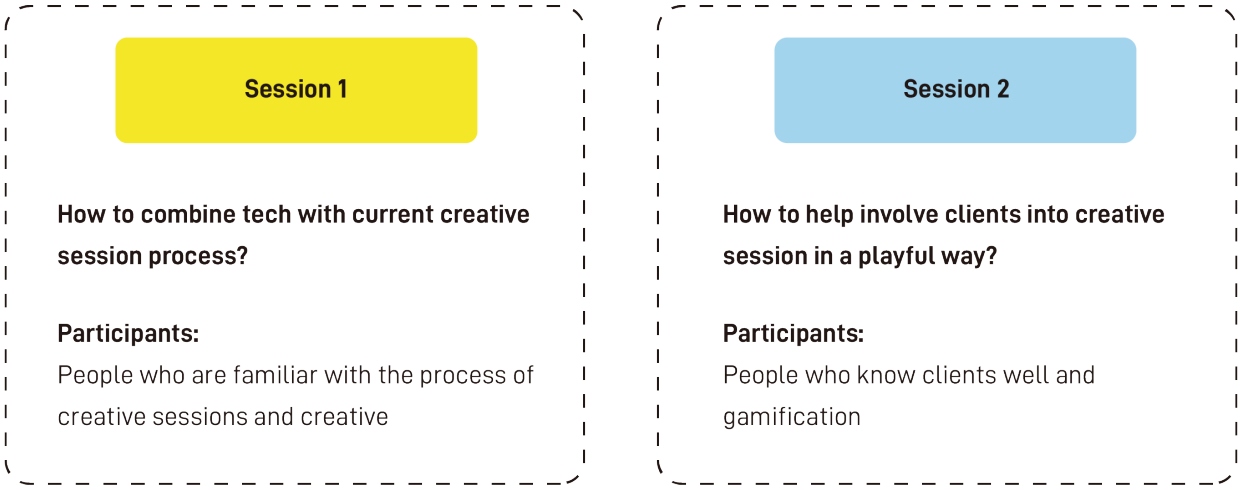


Figure 27. Overview of two sessions

5.2 Session 1: Envision the Future

In this session, the future creative session experience is envisioned. Also some game mechanics and playful elements which alredy poped out at the research phase were applied to this session to test if they would work as expected.

5.2.1 Goal

1. Envision the future creative session with different media
2. Validate assumpted effects of specific mechanics and playful elements

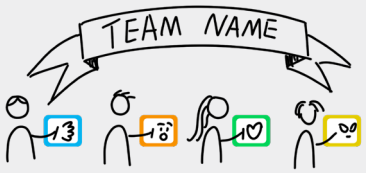
5.2.2 Resource Group

For this creative session, the resource group were required to not merely know the process of creative sessions but also be open-minded enough to envision the future. Students who have taken the course Creative Facilitation were suitable candidates for the session. At the end, 4 CF students were chosen.

5.2.3 Design Elements Waiting to be Tested

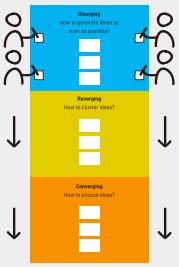
The complete session setup and process can be seen in appendix F. Based on the graduate student's assuption, before this session some design elements have been chosen to validate their effect for the conceptualization phase. Here are the introductions of design elements waiting to be tested:

Team Building



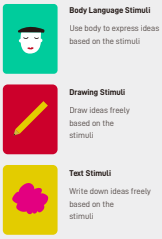
At the start of the session, the resource group would be asked to draw their own profile together and name the team for themselves.

Team Match



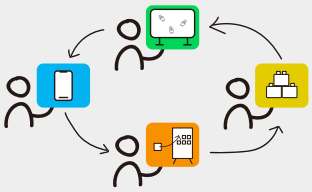
In the diverging phase, the resource group would be asked to divide into 2 teams to compete for a team campaign together.

Stimuli Card



In the diverging phase, there are stimuli cards for inspiration, which encourage the resource group to write down ideas, draw ideas or use body movements to express.

Brainwriting



In the diverging phase, brainwriting would be applied. By sharing ideas without speaking, it enable each resource group to make better ideas on all parts of the subject

Figure 28. Introductions of design elements

5.2.4 Results

During this creative session, the effect of selected design elements were validated and new available design elements came out. Here are the validation results of these design elments:

Teambuilding ✅	Forming a team at the start of the session helped resource group embrace each other and the team atmosphere became more active

Team Match ✅	Team Match worked better than expected. The competition increased enthusiasm for participation and discussion between team members improve the quality of ideas.
Stimuli Card ✅	The format of boardgames using stimuli cards also increased the resource group's enthusiam for participation.
Brainwriting ❓	The brainwirint gave each resource group the chance to hitchhike on others' ideas but during the process the resource group didn't have the chance to fully communicate.
Waterfall ❓	In the waterfall process, resource group proceeded in dynamic but this format was too unique to cope with most creative sessions.

5.3 Session 2: Collaborative Creative Session

The second session focused on how to involve non-designer participants like clients into creative sessions to better collaborate with designers. Meanwhile, some valuable design elements came out in the session.

5.3.1 Goal

1. Better identify the role of clients in the creative session
2. Generate ideas on how to better collaborate between clients and game designers
3. Find more design elements in this session

5.3.2 Resource Group

Talking to several game designers at &RANJ indicated that it is quite hard for people without any experience to come up with ideas for designs. That is why three game designers who were already familiar with the clients and the context of creative sessions were involved in this brainstorm to explore how to collaborate with non-designer partiicpants. The graduate student acted as a facilitator and guided the session.

5.3.3 Method

The complete method part can be seen in appendix G. In this session, Lego Serious Play was mainly used to build personas of clients.

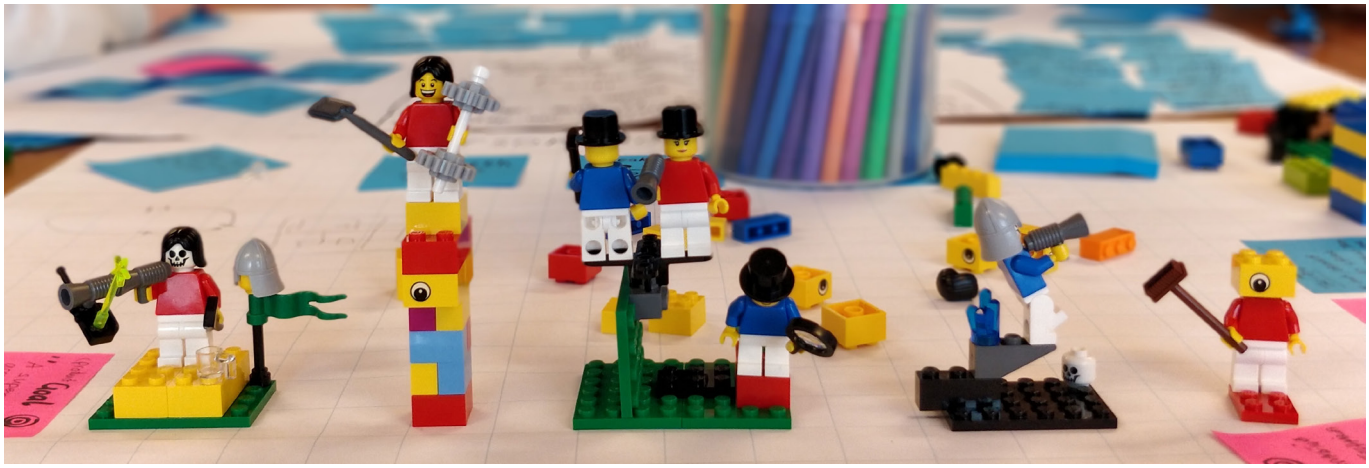


Figure 28. Diverse persona of the client

5.3.4 Results

Based on the diverse persona of clients, the insights target for non-designer participants were summarized:

Jump Out of Current Role

"A super accurate and valuable representation of real-life so it won't be criticized by my peers"

Create Instead of Only Discuss

"Analysis the important elements and switch between discussing it and creating from it."

Unsure to Assure

"Clients are uncertain about their performance and the result in the creative session."

Ownership for Creating New Ideas

"I don't play games,"

"yeah...but it won't work"

Also during this session, three valuable deisgn elements came out and were validated:

Rewarding ✓	Rewardinf worked in the whole session. Instead of rewarding items in the session, time or unique power can also the contents of rewarding.
SCAMPER ✓	In converging phase, SCAMPER was used for iterating ideas. And it was compatible with most types of creative sessions.
Phase Check ✓	At the end of each phase, self-assess questions were set to see if the resource group has done well currently. It improved the quality of the session with sufficient time.

5.4 Summary of Design Elements

The design elements validated and collected from the two sessions are summarized and classified according to the gameful design method of Deterding (2015) to three categories: rule, mechnism and motivation. And these design elements are in preparation for the next conceptualization part.

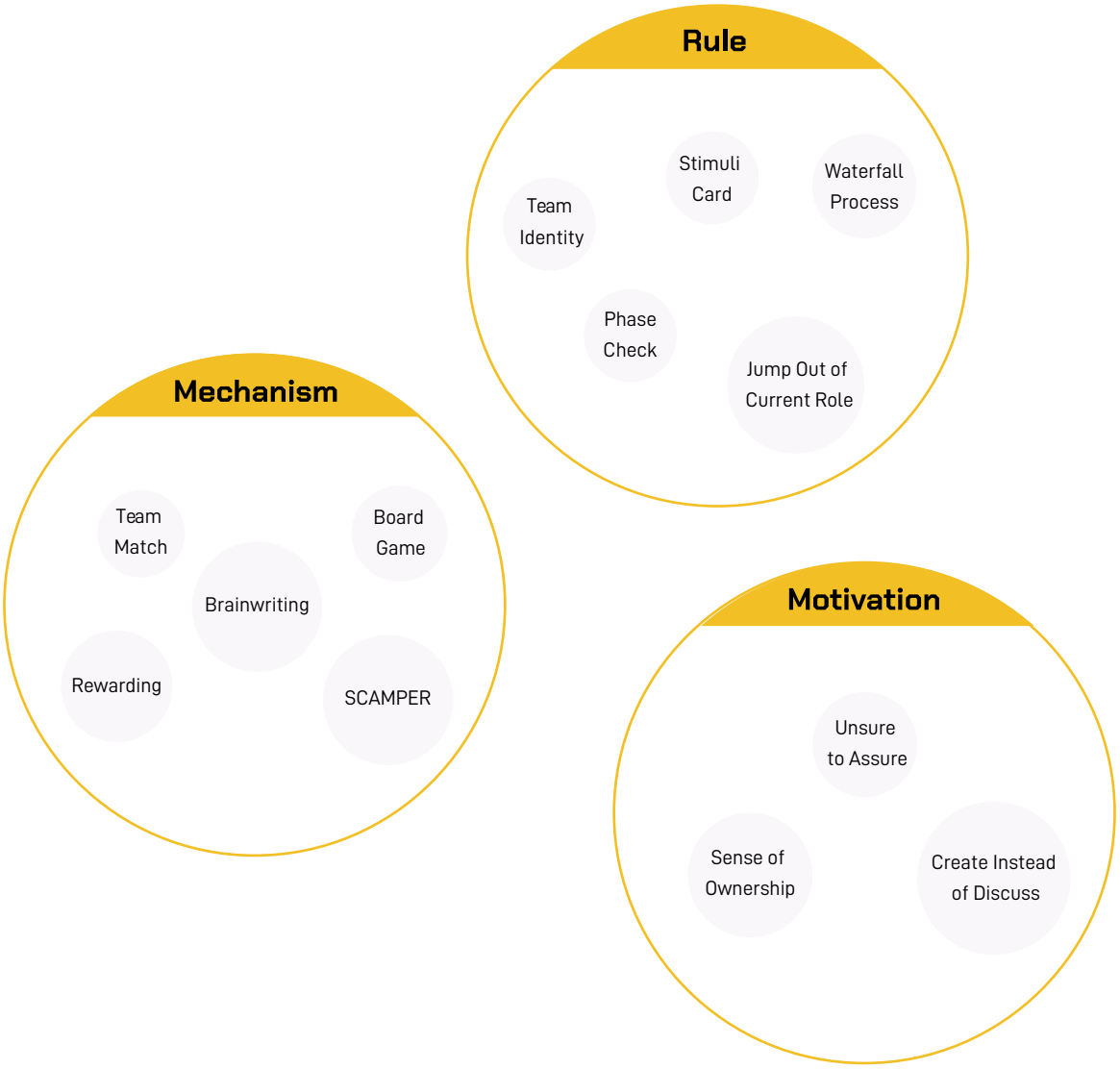


Figure 29. Categories of design elements

6. Conceptualisation

In this chapter

The chapter describes the integration of diverse design elements collected in the previous chapter. Scattered design elements are unified by a complete story. The idea in every stage in the creative session are selected and iterated by gathering feedbacks from playtest.

6.1 Story

According to chapter 2.2.4 Game Design Elements, a playful experience is created by four basic design elements: mechanic, story, aesthetics and technology. Mechanic and technology have been explored in the research phase. Now stepping into the design phase, story starts getting attention. Here is the overview of the whole story iteration part.

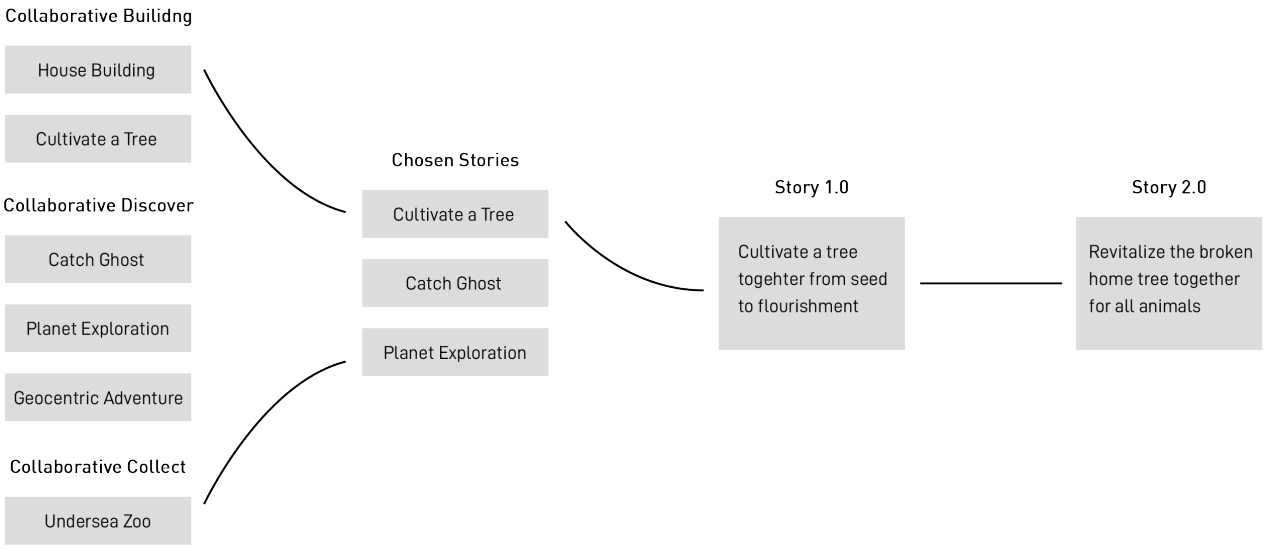


Figure 30. Overview of Story Iteration

6.1.1 Story 1.0

In this section, the question is expected be answered:

> **“ How to come up with a story that seamlessly connects different phases in the creative session and help participants better get immersive to the process? ”**

With the question in mind, the graduate student began iterating the story:

Individual idea generation

Via individual idea generation session, new stories regarding collaboration were come up with by the graduate student. And these story themes were classifed by types of play:

Collaborative Building	Collaborative Discovery	Collaborative Collection
• House Building • Cultivate a Tree	• Catch Ghost • Planet Exploration • Geocentric Adventure	• Undersea Zoo

Table 9. List of story themes

Further Exploration

Among these story themes, three of them were further explored: plant a tree together, work together to fight ghost and planet exploration. The detailed story in every stage of creative session are indicated in the appendix H. In order to choose one story from the three mentioned stories, the choosing criteria was formulated based on two aspects:

1. If the story helped get participants get more immersive to the session.
2. If the story can connect different parts in the session smoothly and easy to give participants an overview of the whole session progress.

To quickly review the extent of acceptance of participants for the stories, a simple usage inspection with story narratives was organized. The main insights from the inspection were used to choose an appropriate story for the whole creative session phases. And finally based on the insights and criteria of choosing stories, the story of developing trees together were chosen for the narrative for the creative session.

The reasons behind the choice are as follows:

1. First of all the story of cultivating a tree is easy to understand for most people and able to leave an overall expectation to the result of the session.
2. Also considering that the operations and mindsets for the resource group in four stages are different, the story itself is required to have enough space of details to be compatible with creative session stages. And the growing status dynamics in cultivating a tree assures enough detail space for that.

Therefore, the story 1.0 was formulated as planting a tree together by players. Here is a framework of which story is there in different stages during the creative session in story 1.0.

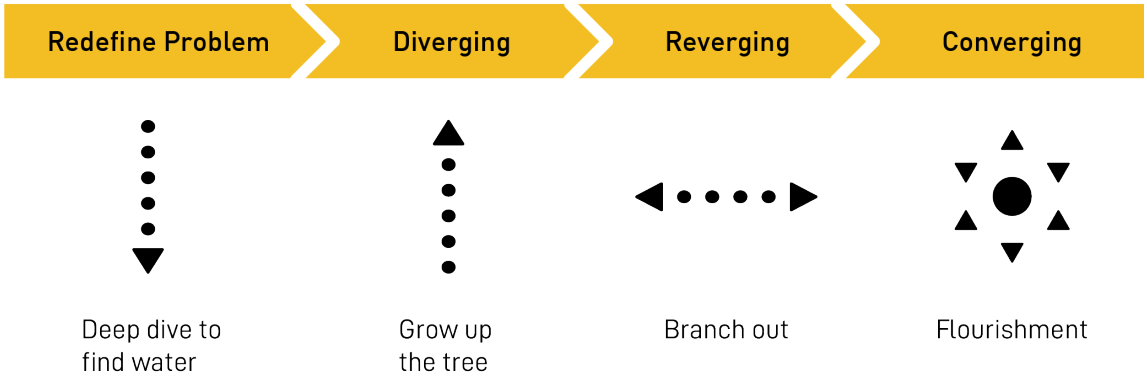


Figure 31. Overview of Story 1.0

6.1.2 Story 2.0

Every story has its plot trend. And the plot trend in this story is that the cultivated tree grows tall and finally flourish. And here are the feedback from other game designers about this story:

> " it's complete but not attractive enough. And more unique should stand out at the end."
>
> "it's already good but the whole story of cultivating trees together can still be improved. I don't have an expectation for that.".

From the feedback, the current narrative is clear and linear to follow. But it didn't strongly help testers get committed to the world of the narrative. Therefore, the narrative of the story was iterated based on the theatre framework of Hero's Journey (Campbell, 2003). Hero's Journey is the common template of a broad category of tales and lore. It enables the audience to quickly jump out their real life and get immersive to the story world. And an iterated narrative was created:

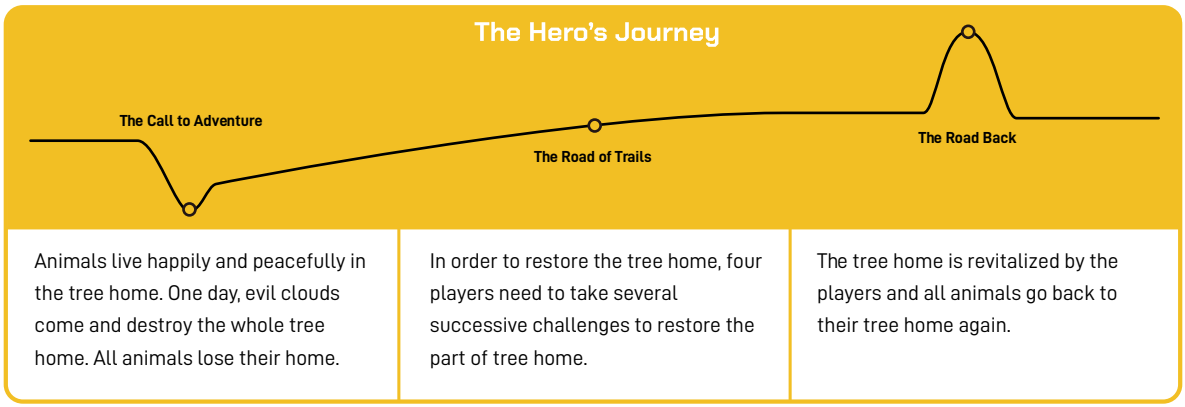


Figure 32. The hero's journey

6.2 Choice of Interaction

Before deep diving into the iteration of different stages, the interaction technology needs to be mentioned because it would greatly influence the whole experience.

Different ways of technology can be put into the session. And applying different tech can make different interactions happen. Several students in IO faculty were invited to try two interactive ways. Based on their feedback, one of them was selected as the final interaction.

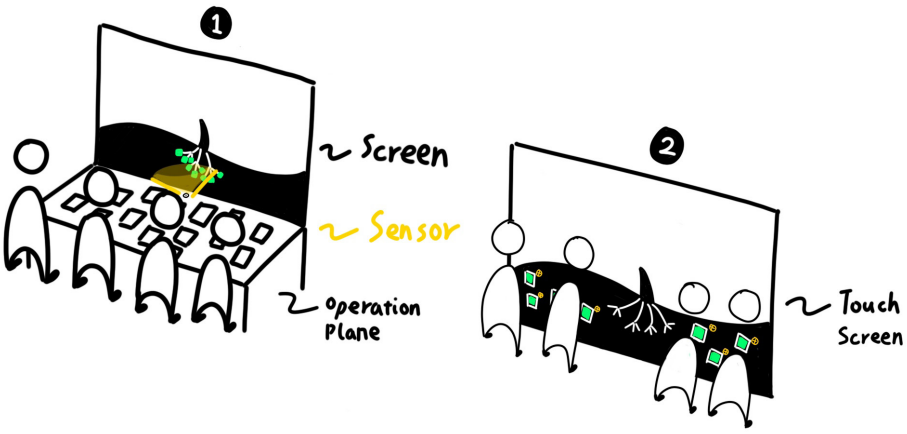


Figure 33. Two interactive ways

The first interactive way is to use game controllers to interact with the screen. The second interactive way is to use touch screen to interact with the screen. The detialed strength and weakness analysis can be seen in appendix I. And finally, based on the feedback of testers, the first interactive way was selected.

6.3 Framework of Playful Game Experience

In order to formulate a playful experience, the framework: "**The lens of intrinsic skill atoms**" which is mentioned in chapter 2.2.5 is an essencial reference. And here is the initial framework of the game experience based on " the lens of intrinsic skill atoms."

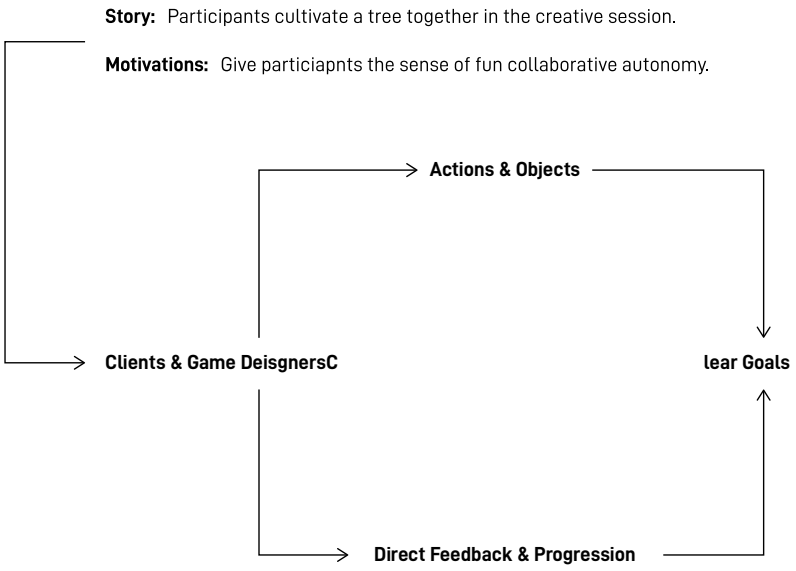


Figure 34. Framework of playful game experience

Among the framework of game experience, clear goals are the most essential part for the game experience and are assured first. For the graduation project, there are three goals to achieve:

Session Goal: The Goal of the stage in the creative session;

Game Goal: The Goal of the challenge in every game

Emotion Goal: The Goal of emotion that participants are expected to evoke in the stage.

And the graph below shows the concrete contents of goals in each stage

Figure 35. Goals for Every Stage

6.4 Iteration through Playtest

In this section, for each stage in the creative session, several prototypes were created and tested with around 30 people from both the TUDelft and game designers through **playtesting**. There are a lot of fails and success in the iteration process: the failure designs lead to new designs for next playtest, and the successful designs are iterated many times and leave the useful design elements for the final design.

And here is the overview of the whole process of iteration.

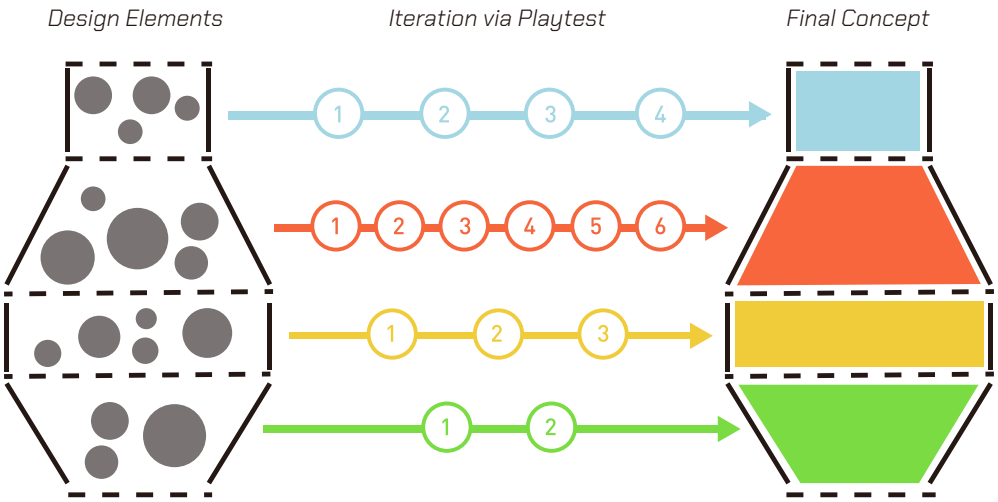


Figure 36. Process of Iteration

6.4.1 Playtest

In this concept iteration, playtest was chosen as the research method. Playtest is a common method for game designers to answer their questions via game prototypes. Playtest is necessary to serve as a wakeup call and force game designers to solve the problems that they would ignore if not tested (Schell, 2014).

Playtest is all about getting people to come play the game to see if it engenders the experience for which it was designed. A playtest is a prototype of the game experience. Before playtesting, game designers shall already have some research questions and try to be answered during test. The more specific the questions game designers have when they organize the playtest, the more they would get out of it. Every round of playtest is called play loop, it involves:

1. Have a major question in mind
2. Think of an idea
3. Try it out
4. Keep changing it and testing it until it seems good enough

6.4.2 Iteration for Redefine Problem Stage

Before the iteration, all insights concerning the redefine problem phase are summarized as following:

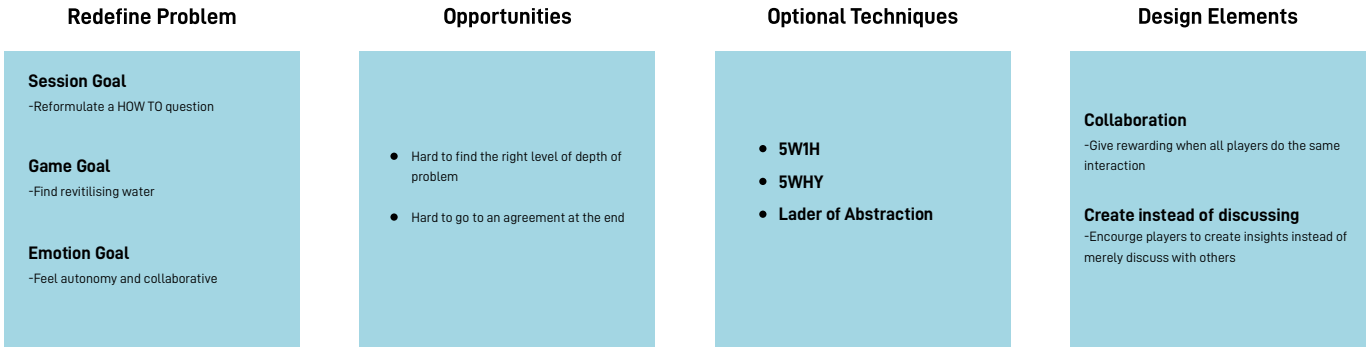


Figure 37. Summary of insights for redefine problem stage

The iteration for redefine problem stage went through 4 playloops, the following figure shows the overview of 4 playloops. Duo to space limitations, only 4th playloop would be elaborated and complete iteration process can be seen in appendix J.

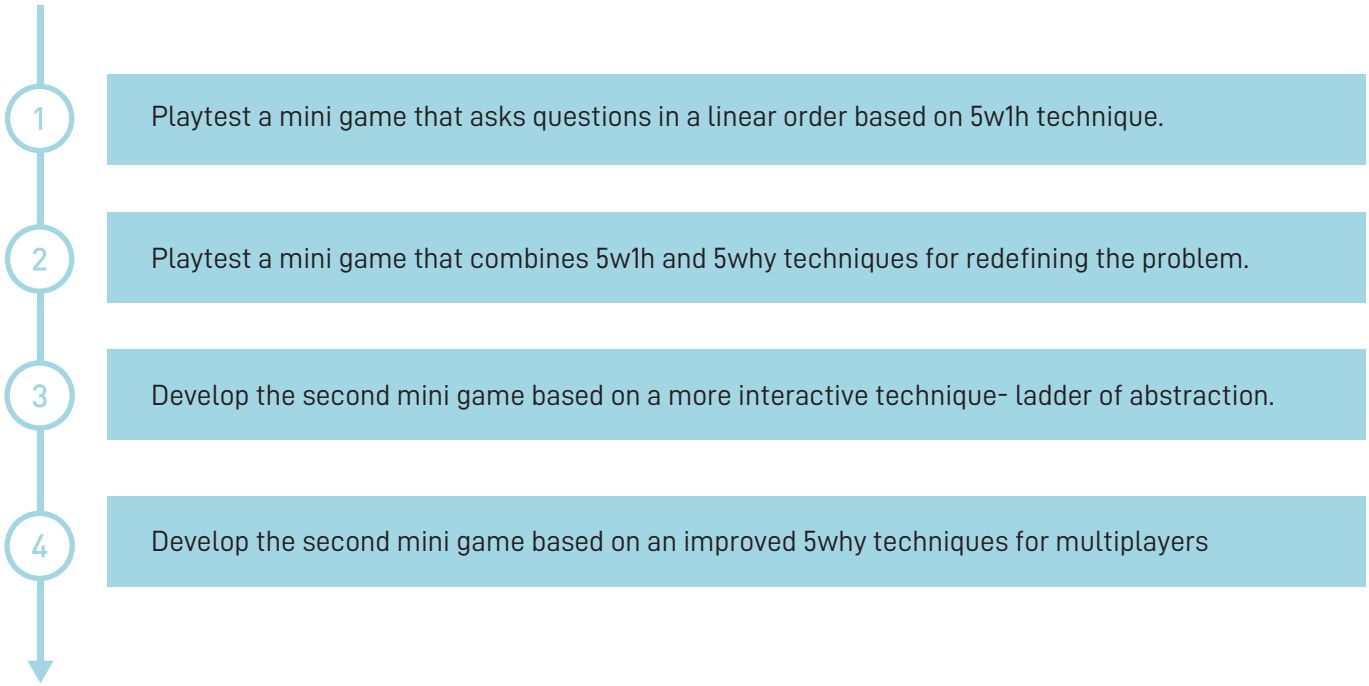


Figure 38. Overview of playloops

The 4th Playloop

Problem Statement

Develop the second mini game based on an improved 5why techniques for multiplayers

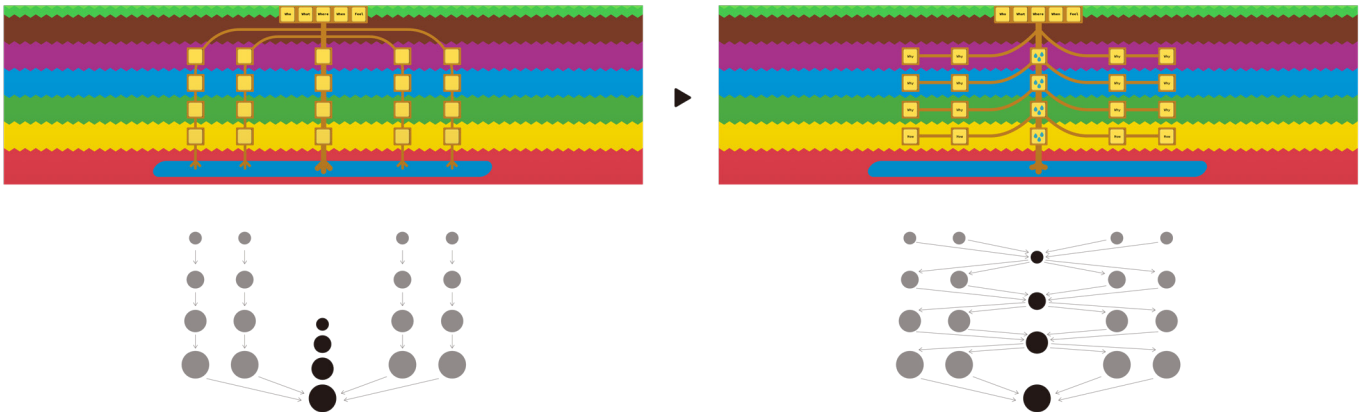


Figure 39. Change of 5 WHY method for multiplayers

Brief Introduction

In this playloop, a comparative play was conducted and the most focus was put on improving 5 WHY method for multiplayers. In the orginal 5 WHY method, the individual player was asked to keep thinking why for several rounds to find the essence of the initial problem. It worked for individual players but not for multiplayers. As seen in the left side of figure 39, players were asked to keep thinking why individually. Every player was on its own track for several rounds and at the end, it was hard to get an agreement between players. When encounting this situation, another 5 WHY method was proposed. As seen in the right side of figure 39, in every round the players were asked to think why first then discussed to get an agreement. Based on the agreement, players were aksed to think a new round why.

Feedback from Players

What worked Discussion after each round made it easier to get an agreement between players

What not Choose one opinion from four opinions to get an agrement made it like a competition between players. It made some players feel stressful.

Summary for Redefien Problem Stage Iteration

Compared with designs in different playloops, they both have their own strength and weakness. The design in third and forth playloop performed best. Considering that the deisgn is faced up to multiplayers, the improved 5WHY method in forth playloop is more suitable for this context. In conclusion, the final design would be based on the improved 5WHY technique and aspire to increase the degree of interaction for players.

6.4.3 Iteration for Diverging Stage

Before the iteration, all insights concerning the diverging phase are summarized as following:

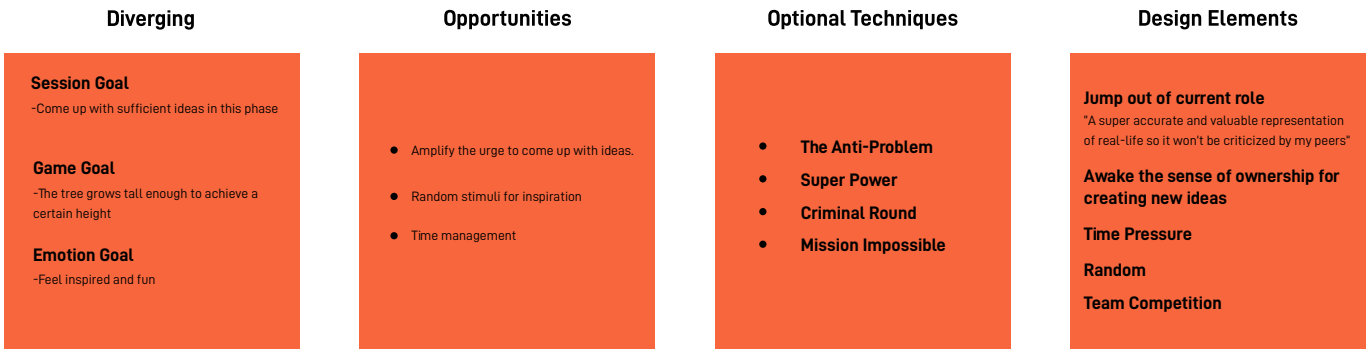


Figure 40. Summary of insights for diverging stage

The iteration for diverging stage went through 6 playloops, the following figure shows the overview of 6 playloops. Duo to space limitations, 4th, 5th, 6th playloop would be elaborated and complete iteration process can be seen in appendix J.

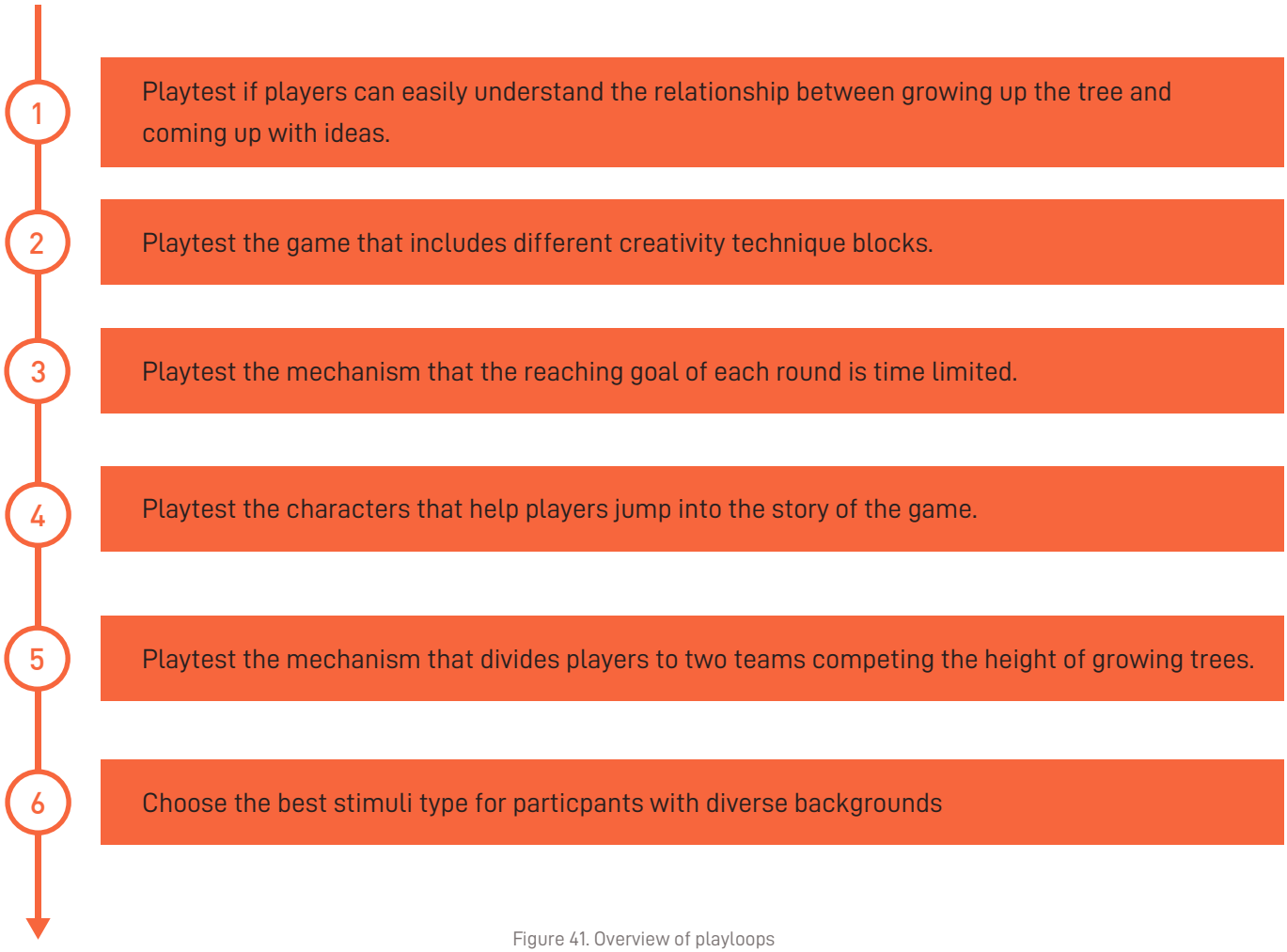


Figure 41. Overview of playloops

The 4th Playloop

Problem Statement

Design the characters that help players jump into the story of the game.

Figure 42. Interface of selecting characters

Brief Introduction

From the result of exploratory research, acting as new character could help players get away from their life and jump into the magic circle of the game. Also the adding of animal characters can make the whole tree growing games more vivid. Therefore the part of character selecting process was made .

Feedback from Players

What worked The players liked it and thought it cute

What not Now the current concept was really like a game but not everyone liked games. Therefore this concept had some risks to the player who didn't have a game experience before.

The 5th Playloop

Problem Statement

Playtest the mechanism that divides players to two teams competing the height of growing trees.

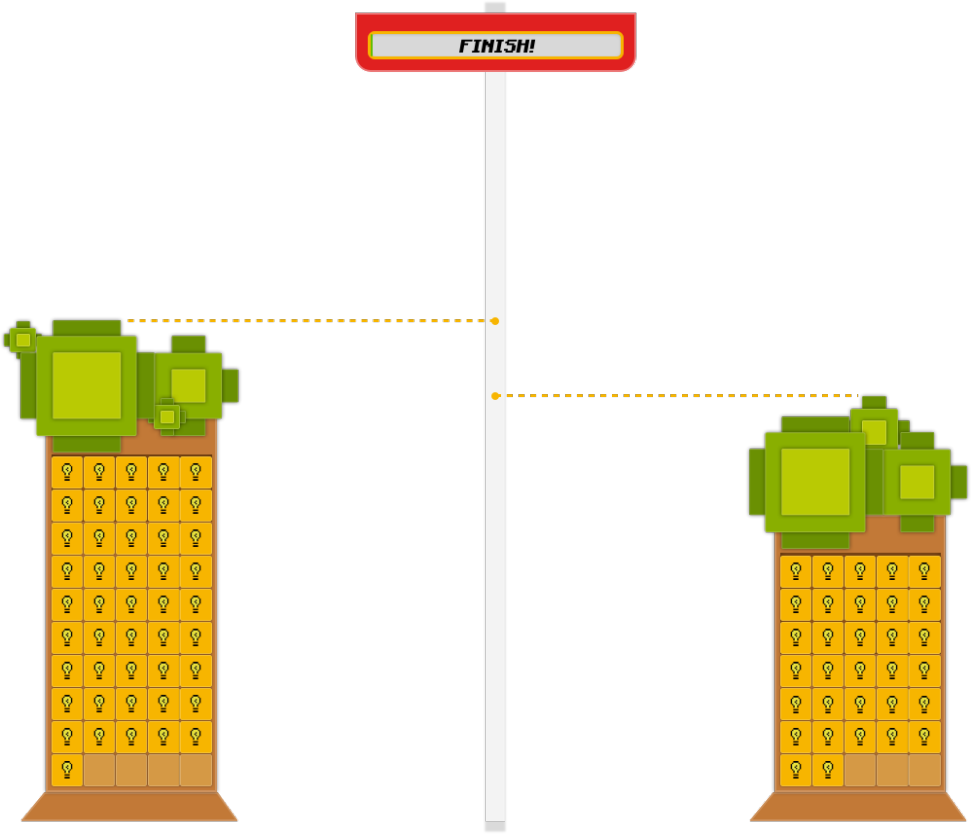


Figure 43. Interface of team competition

Brief Introduction

From the feedback of the 3rd playloop, the game goal of reaching a certain height for the tree together is clear but not motivating enough for the players. In order to give more meaning to the height of the tree, the mechanic of team competition was introduced. 4 players would be split into 2 teams to compete the height of trees they build.

Feedback from Players

What worked The players cared more about the result of the game.

What worked The discussion within the team helped improve the quality of ideas to some extent

What not With the mechanism of competition, the players focused more on the quantity of ideas and ignore the quality of ideas.

The 6th Playloop

Problem Statement

Choose the best stimuli type for particpants with diverse backgrounds

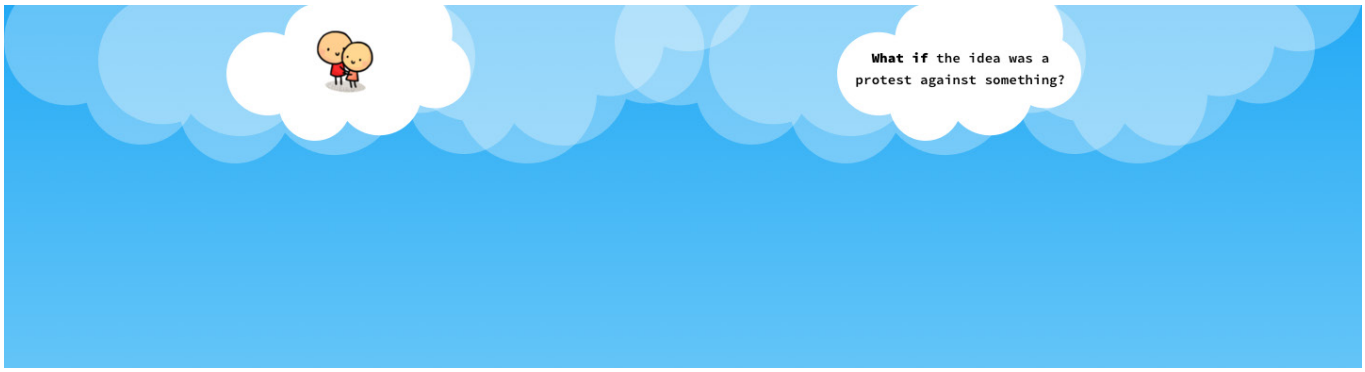


Figure 44. Random images and trigger words

Brief Introduction

There are different kinds of stimuli for the players such as random images, random words or trigger words. And different stimuli are suitable for different target group. In the grauate student's assumption, for the players without design backgrounds, when facing up with an open-ended problem statement, they don't know where to start and the ideas they come up with for the problem is always general. Considering that a trigger with the question " what if " could offer some promising directions for players to come up with more solid better ideas. Therefore a comparative playtest between random images and random trigger words was conducted.

Feedback from Players

What worked Trigger words worked better on narrowing problem scope and helped player come up with better ideas

What not Trigger words made players think in one certain direction

Summary for Diverging Stage Iteration

After six loops of playtest, the main elements for the final design are assured like time slot, character selecting ,team competition and trigger words. What needs to mention is that the creative technique blocks in the diverging phase. It shall be modular and be selected according to facilitator's requirement.

6.4.4 Iteration for Reverging Stage

Before the iteration, all insights concerning the reverging phase are summarized as following:

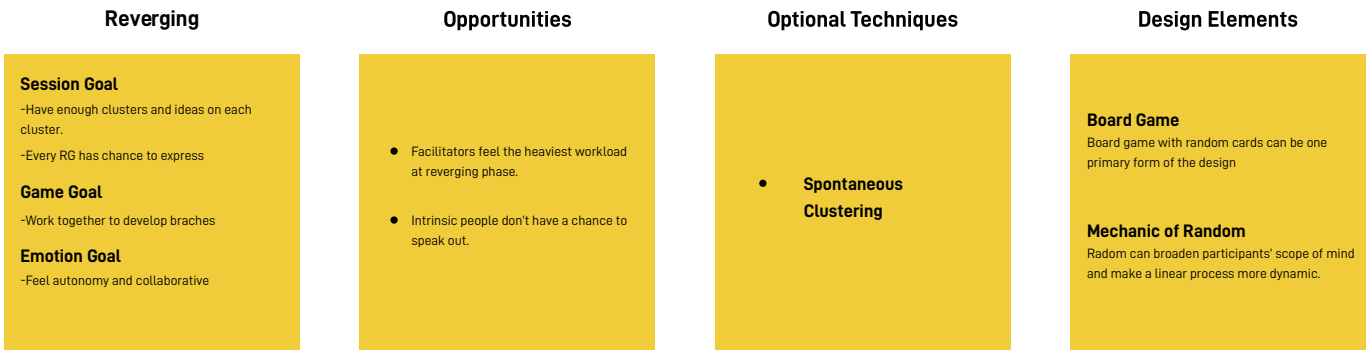


Figure 45. Summary of insights for reverging stage

The iteration for reverging stage went through 3 playloops, the following figure shows the overview of 3 playloops. Duo to space limitations, 3rd playloop would be elaborated and complete iteration process can be seen in appendix J.

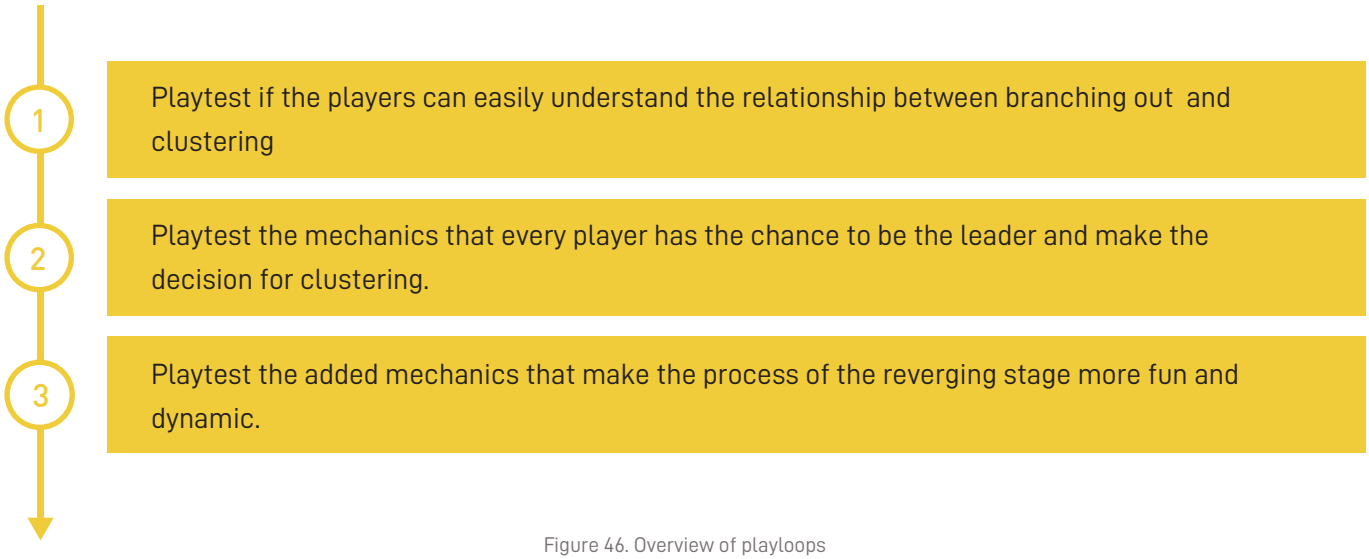


Figure 46. Overview of playloops

The 3rd Playloop

Problem Statement

Playtest the added mechanics that make the process of the reverging stage more fun and dynamic.

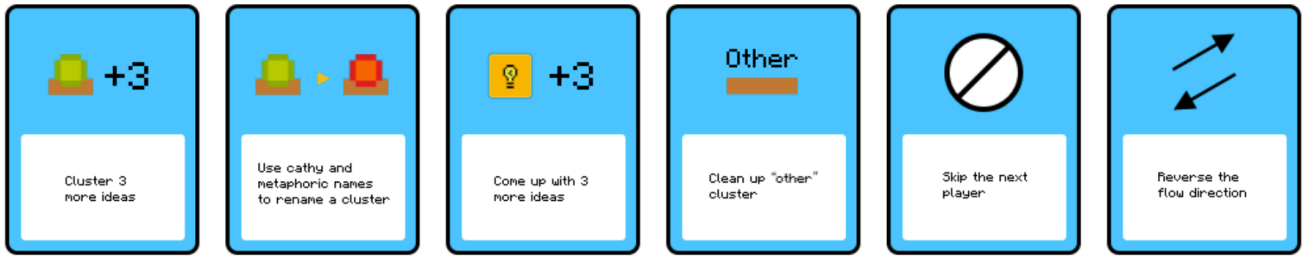


Figure 47. Random images and trigger words

Brief Introduction

In the third design, the random mechanic was introduced. Every time the player finished his or her turn, he or she would have a chance to draw a function card. The contents on the card are diverse to help increase the dynamics of the game. And the playtest was to test if the mechanism could help the clustering process or make it more chaotic.

Feedback from Players

What worked The process of the reverging phase became more interactive and players got more involved in

What not The content of the function still had spaces to adjust.

Summary for Reverging Stage Iteration

After three loops of playtest, the final design would focus on the mechanics of drawing ideas post-it and function cards in turns.And more story would add to the reverging stage to better connect with other stages.

6.4.5 Iteration for Converging Stage

Before the iteration, all insights concerning the converging phase are summarized as following:

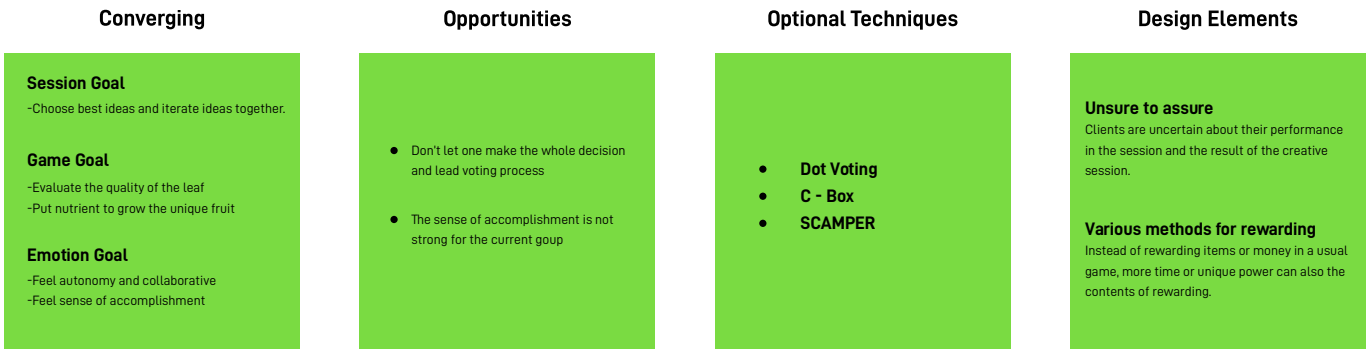


Figure 48. Summary of insights for converging stage

The iteration for converging stage went through 2 playloops, the following figure shows the overview of 2 playloops. And both two playloops would be elaborated.

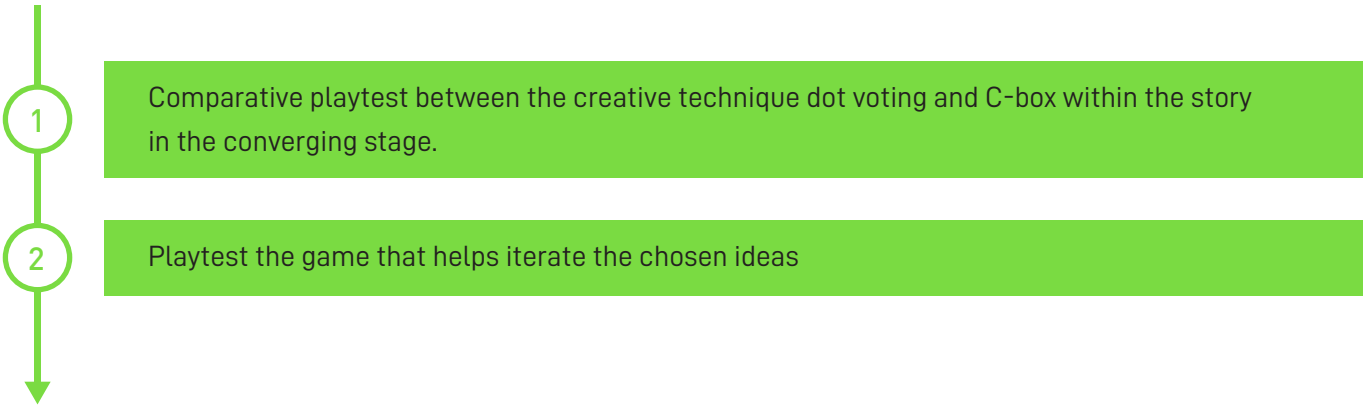


Figure 49. Overview of playloops

The 1st Playloop

Problem Statement

Comparative playtest between the creative technique dot voting and C-box within the story in the converging stage.

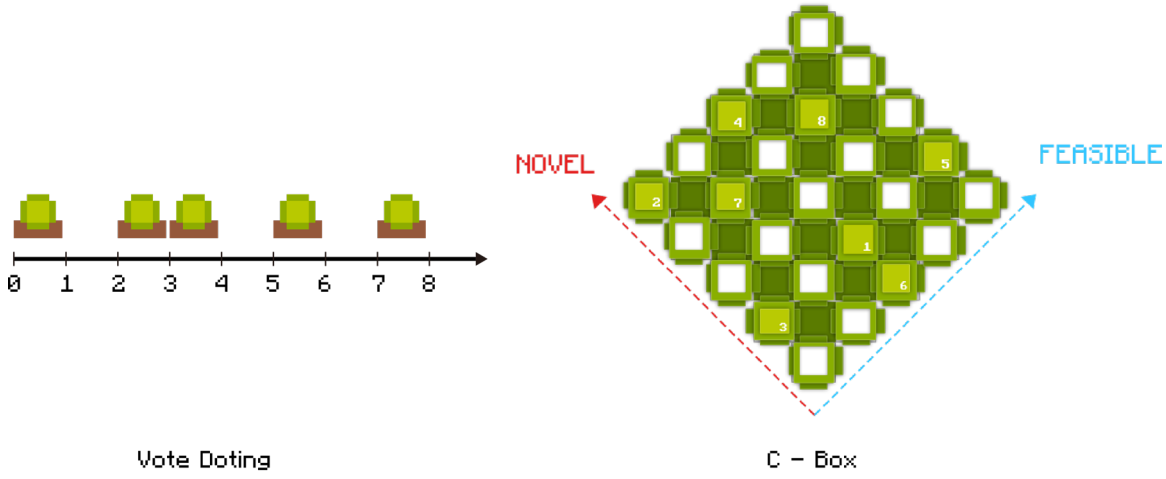


Figure 50. Comparison between Dot Voting and C - Box Techniques

Brief Introduction

In this playtest, more focus were put on the comparison between vote doting and c-box creative techniques. Both of them were common techniques applied in converging stage and players tried both the digital prototypes to see which one was more suitable for the current design. There is a main criteria for judgement: outcome of this operation shall seamlessly connect to the next iteration step.

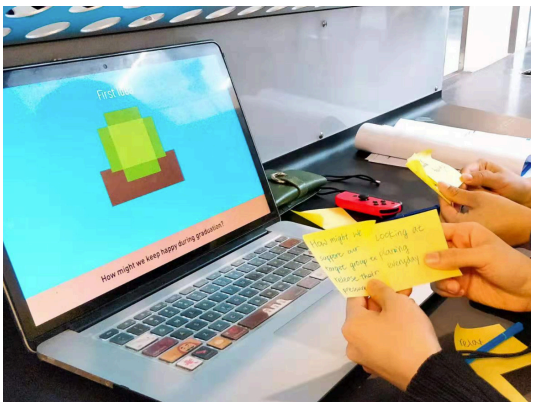


Figure 51. During the Dot-Voting Process

Feedback from Players

What worked Dot-Voting is easy to operate, but the evaluation criteria is single which the chosen ideas are hard to directly iterate.

What worked For C-box, the operation is more complicated but with the two criteria, the chosen ideas are better suitable for iteration

What not Considering clients have their own criteria to choose ideas, both dot - voting and c- box cannot make it work.

The 2nd Playloop

Problem Statement

Playtest the game that helps iterate the chosen ideas

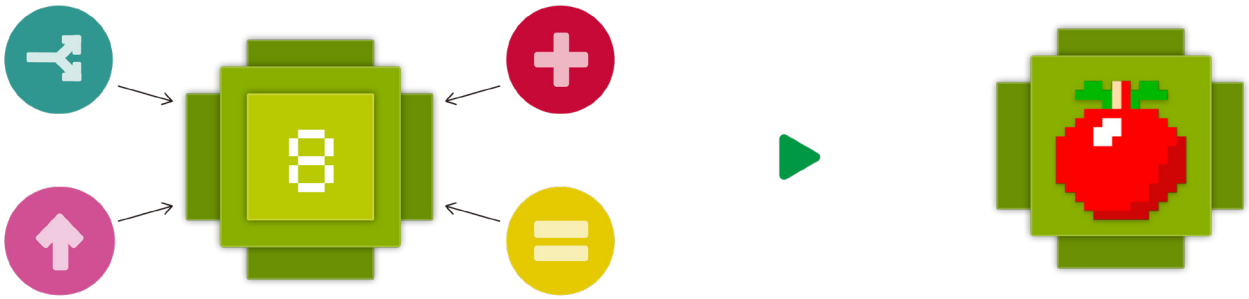


Figure 52. The process of iterating ideas

Brief Introduction

In this design, the story narritive is to use different creative methods involving combine, adapt, magnify and another use as nutrients to make the chosen ideas flourish to a unique fruit. And the playtest was conducted to see if players could make a connection between iterating the idea and flourishing.

Feedback from Players

What worked The game based on SCAMPER creative technique could help iterate chosens to be suitable with clients' requirements.

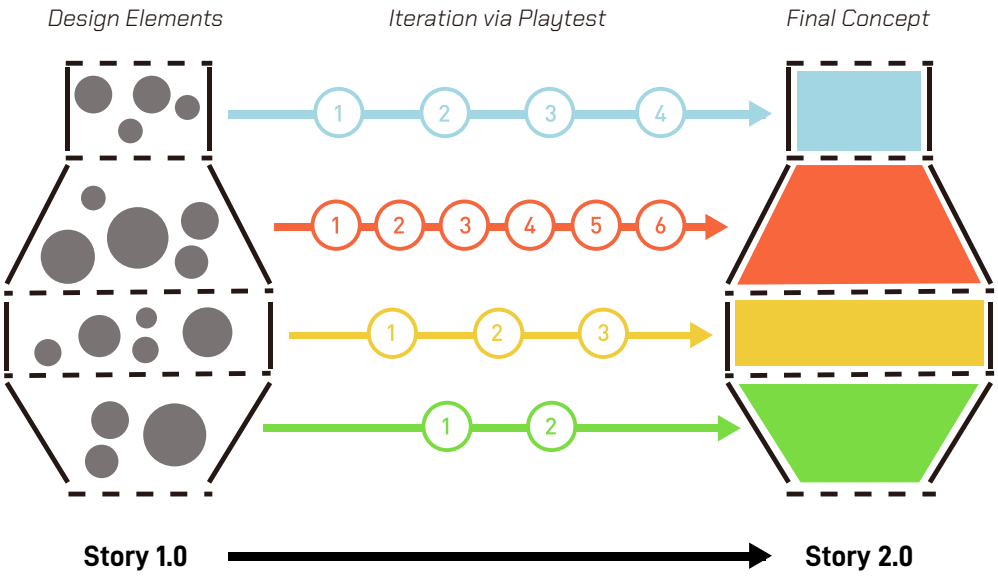
What not Players didn't have the urge to press the button to interact with the screen during the process.

Summary for Converging Stage Iteration

Based on the result of playtest, in the evaluation step c-box would be chosen as the main creative method but the two criteria have the potential to be adjusted. In the iteration step, the SCAMPER technique would continue to be applied but the progression feedback shall be provided during the process.

6.5 Key Take-Aways Chapter 6

Iteration for Final Design



In this chapter, the design elements collected from ideation phase were integrated into 4 different stages of creative session. Through rapid iteration of each stage, the final design was determined with an iterated storyline.

7. Final Design

In this chapter

This chapter describes the details of the final design. The final design is formed by combining iterated prototypes for each stage of creative sessions under a complete story.

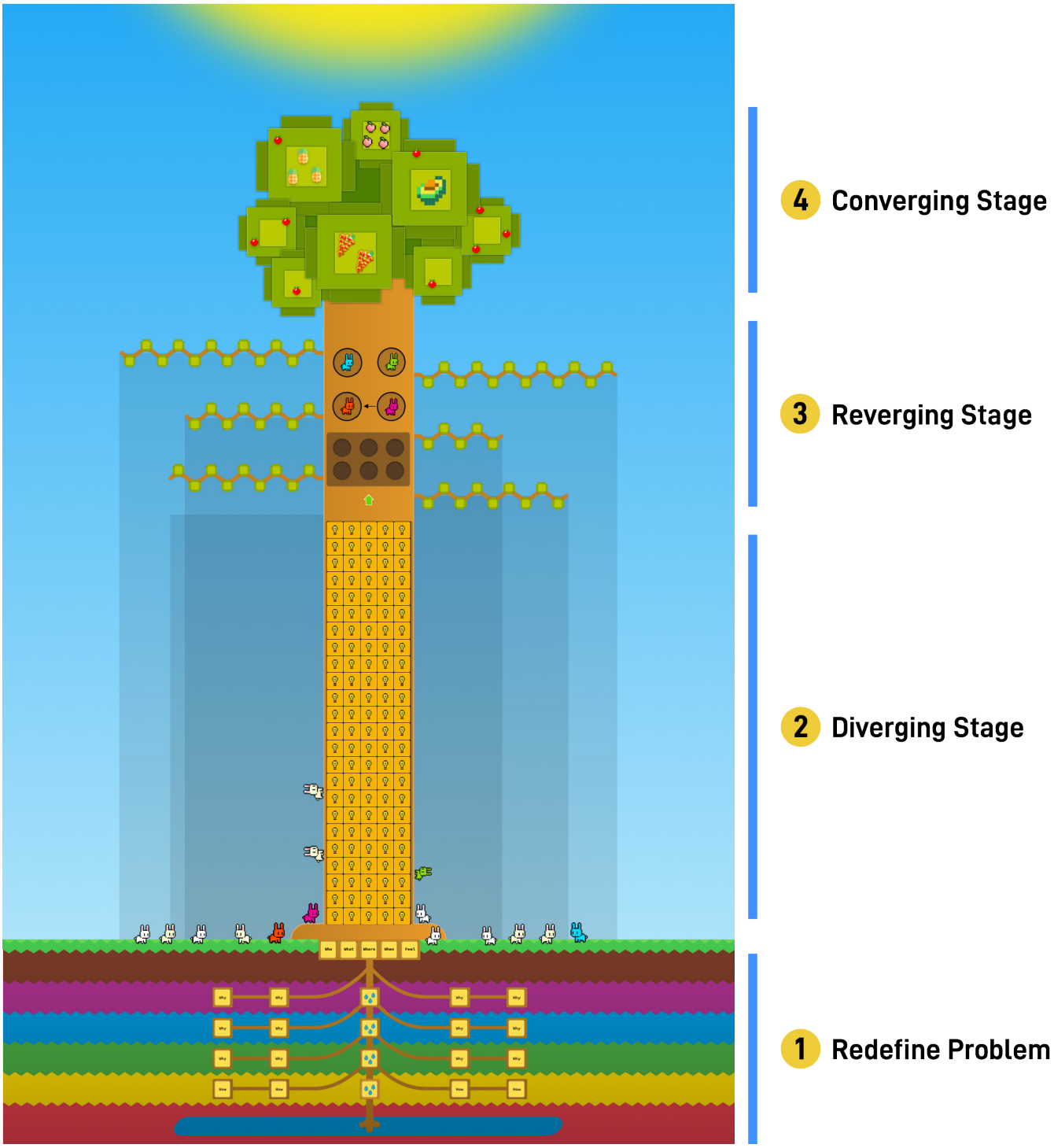


Figure 53. Overview of final concept

7.1 Artifacts Overview

These artifacts are needed for the final design:

- TV screen or Projector
- Laptop
- 4 to 6 Game Controllers
- Button Box
- Prepared Flip Sheets
- Post-it
- Pen

7.2 Position Setting

According to the position of hearth game and selected interaction method, the resource group would sit around a table and all face to the TV screen. The table is the operation area where the resource group interact and the TV screen is the visual feedback area where the participant receive external info for the session.

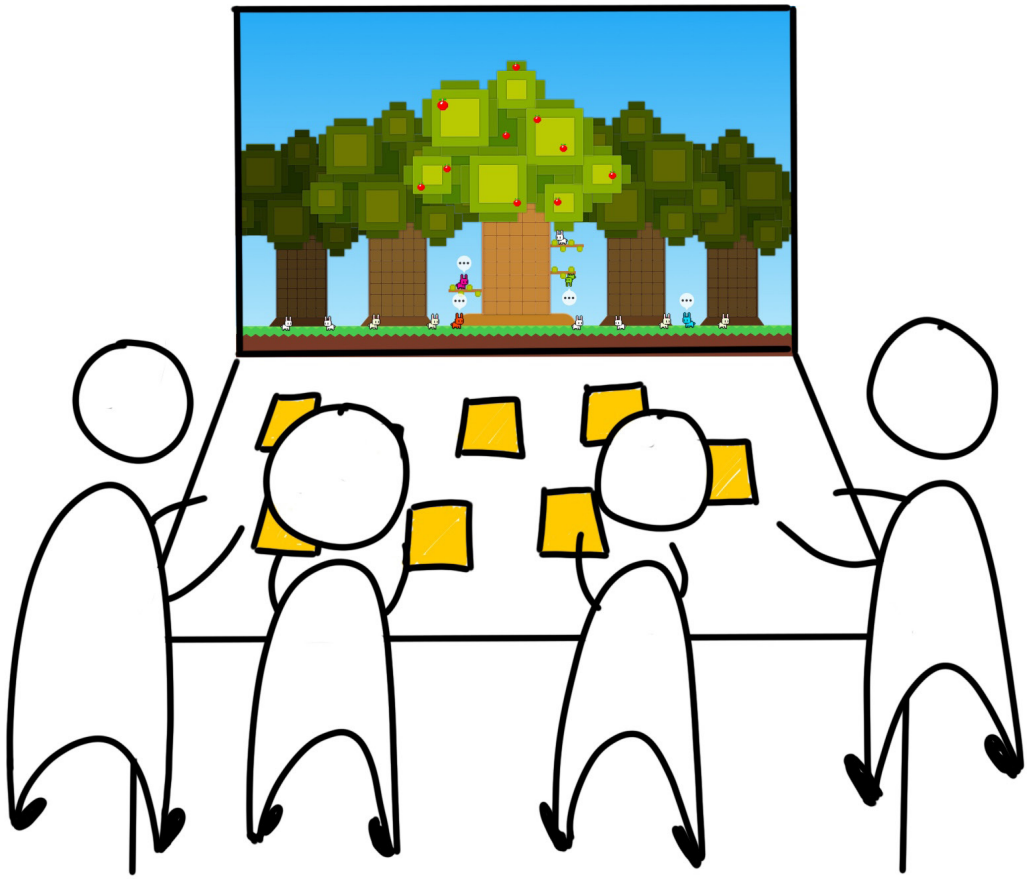


Figure 54. Positioning of Final Concept

7.3 Story Overview

Here is the graph that shows an overview of the whole story:

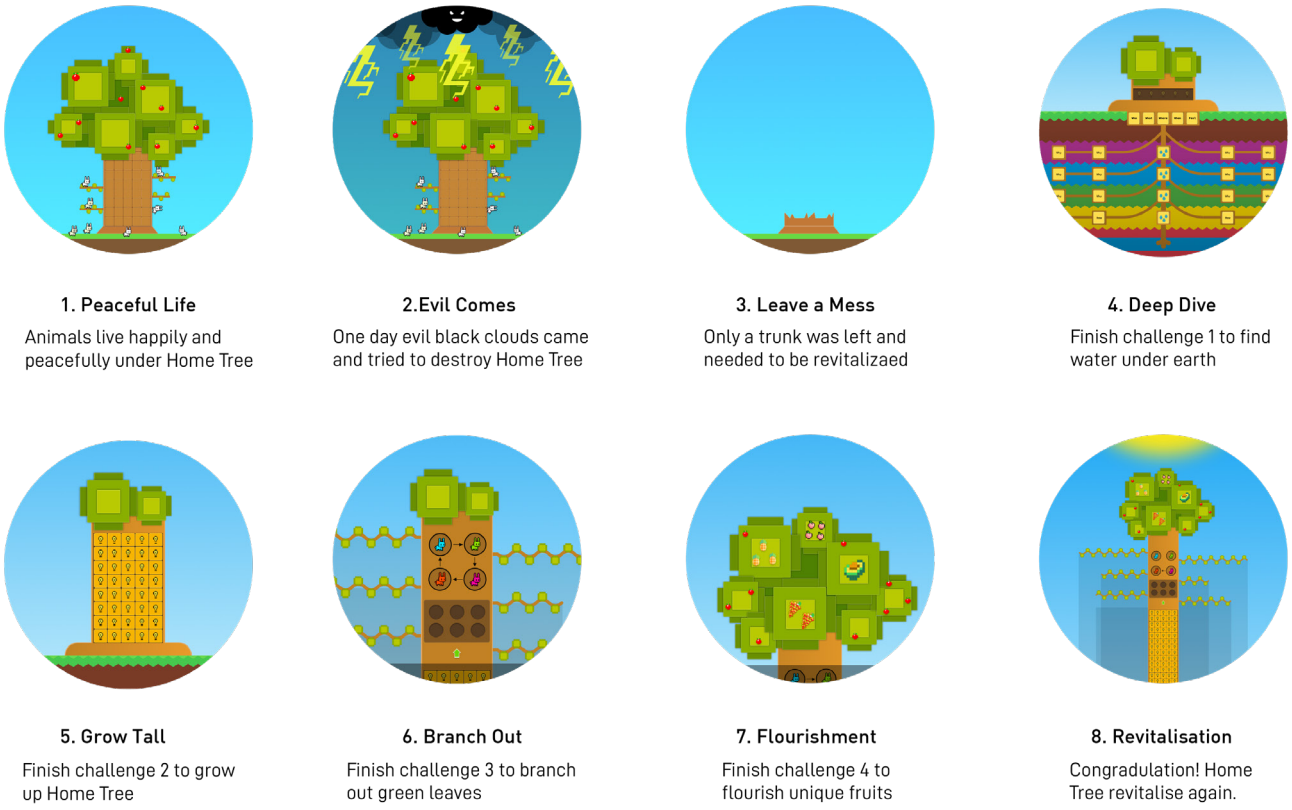


Figure 55. Storyline of Final Concept

7.4 Game Loop

To communicate and understand the functionalities of the gamification design based on the creative session, the overall structure of the game in terms of loops is visualised by the graduate student.

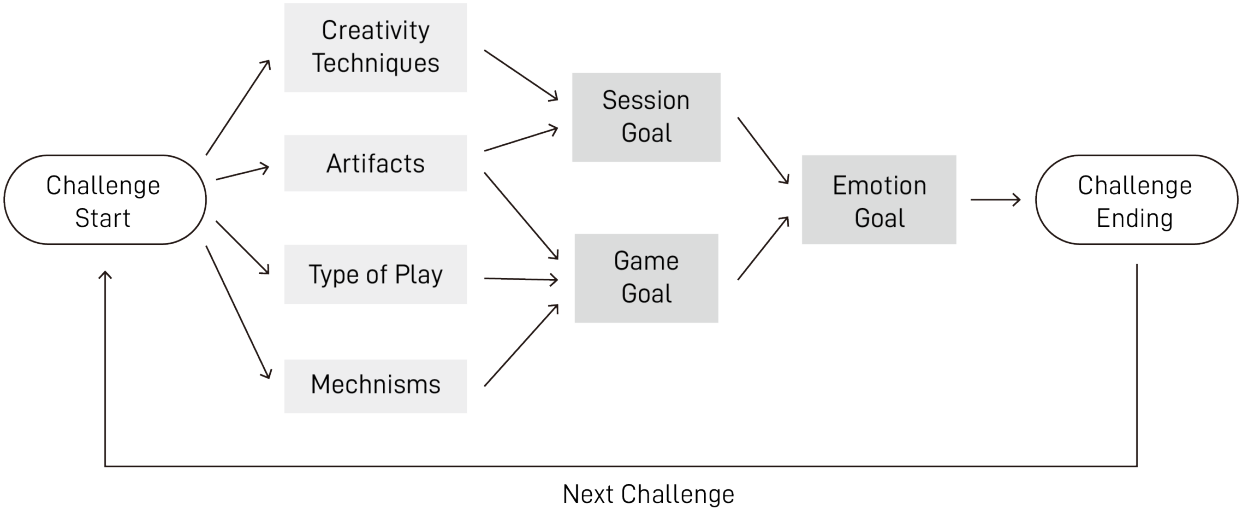


Figure 56. Game loop of fInal concept

7.4.1 Team Forming

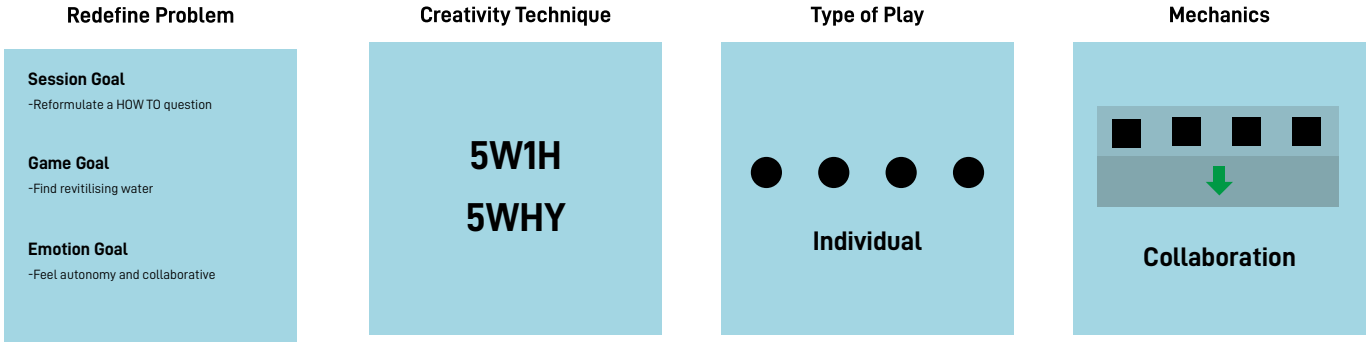
Before players start taking challenges, the team forming process would proceed to help players jump out of their original profession and stimulate collaboration between players.

Team Forming:

The players would act as rabbits who live under the tree. The role selection process better help players into the session and builds an invisible connections between players

7.4.2 Challenge 1 - Deep Dive

Here is the summary of game loop elements in the redefine problem stage



Goals:

There are three goals of this challenge for the players to achieve.

Session Goal:
Reformulate a HOW TO question

Game Goal:
The players continue deep diving to find underground water to revitalize the broken tree.

Emotion Goal:
The experience of this challenge stimulates the players the sense of autonomy and collaborative

Creativity Techniques:

The creativity techniques 5W1H and 5WHY are utilised for this challenge. After the problem introduction by the facilitator, the players would be asked WHO, WHAT, WHEN , WHERE to have a better understanding of the current situation.

For the next step, via the screen, the players would be asked several WHY to get the deep layer of the current problem, at the end the players would be asked HOW once to add more details to the redefined problem.

Artifacts:

Except for commonly used artifacts, two artifacts are needed for this challenge:

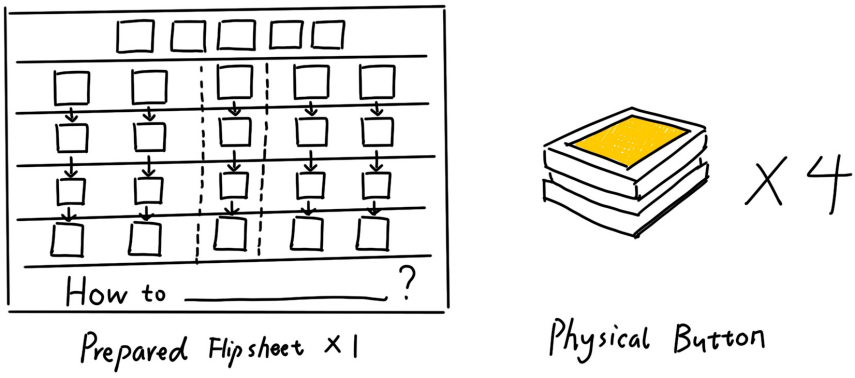


Figure 57. Artifacts for Challenge 1

The first one is the prepared flip sheet. The players need to put written post-it on the corresponding slot. The other one is the physical button box that includes a mini game controller. The button is the bond that connects physical activity and digital contents.

Type of Play:

In this challenge, this play is the individual play which means every player has one button. Everytime the player writes down an idea on a post-it, the buttons shall be pressed.

Mechanics:

In order to achieve the design dart of fun collaborative autonomy and make the game experience more fun, a collaboration mechanism is introduced. For every round, only when every player writes down their post-it and press their buttons, then they could move to the next round together.

Scenario:

The scenario shows the context that shows both operation area and digital screen.

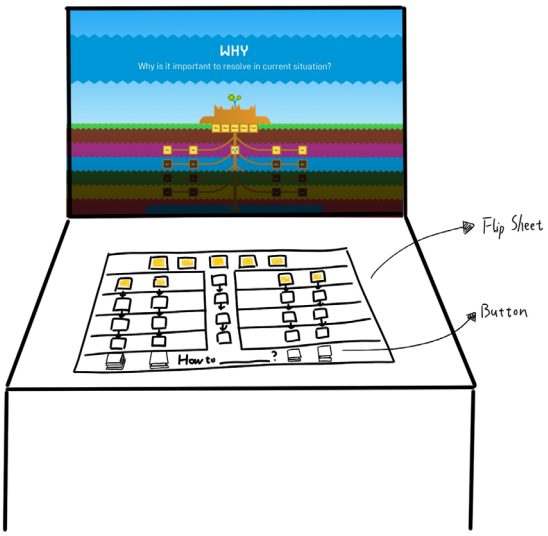
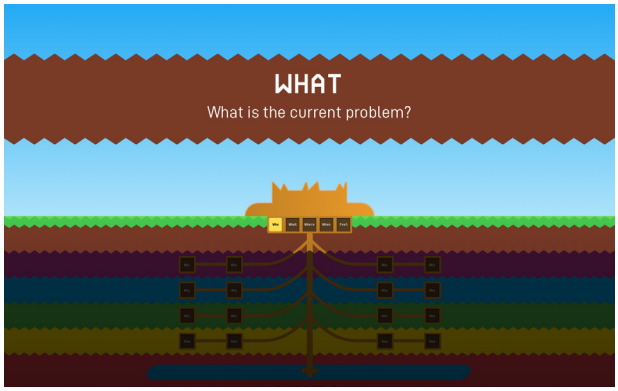


Figure 58. Scenario of challenge 1

Core Steps:

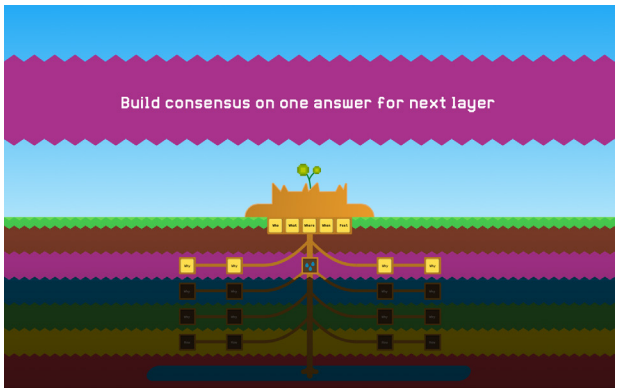


Step 1:

After listening to the problem instruction from facilitators, summarize the info one by one via answering the 5w1h questions.

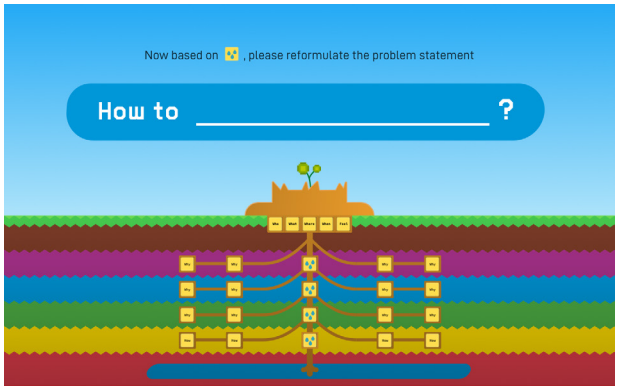
Step 2:

When going to the next layer, for every layer the player needs to answer a why question individually. .And only when every player write down ideas and press the button, a new slot comes up.



Step 3:

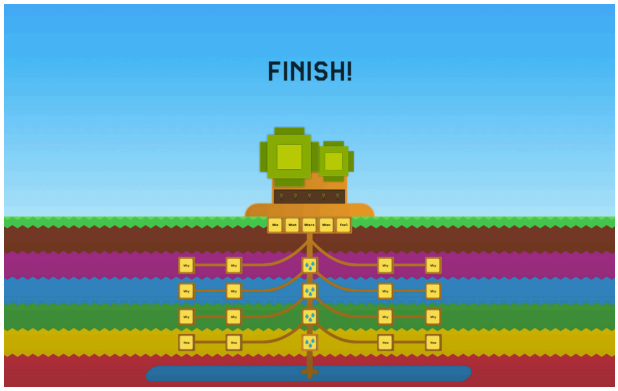
Players are required to build consensus on the answer of this layer. Based on the consensus in this layer, a new why question in next layer would be asked to answer.



Step 4:

After getting through all the layers, a new problem statement is asked to redefine by players together based on the consensus in each layer.

Challenge Ending:



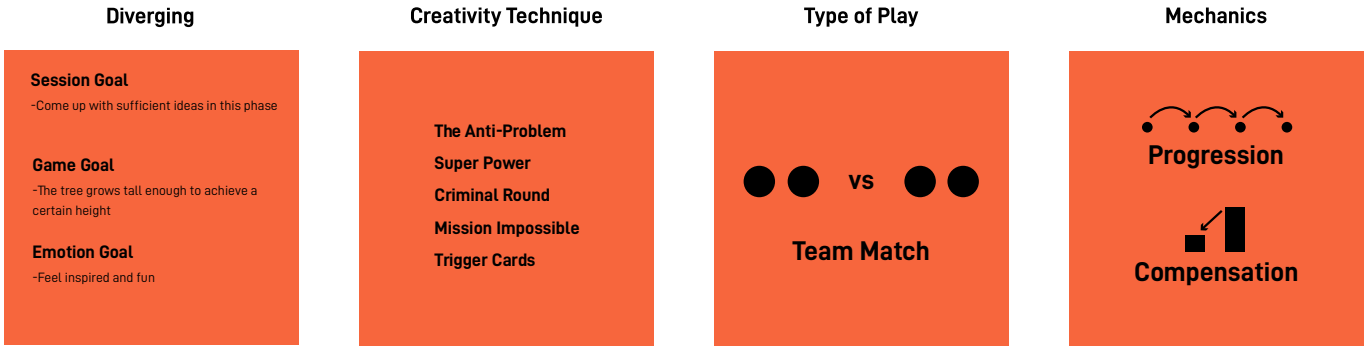
After finishing every challenge, there would be an ending that not only stimulates players with visual feedback but connects with the next stage challenge.

Ending:

The root gets in touch with the water. With the water, the broken tree again sprouts and grows up a little for the next stage.

7.4.3 Challenge 2 - Grow Tall

Here is the summary of game loop elements in the diverging stage



Goals:

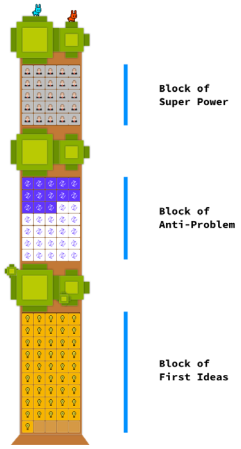
There are three goals of this challenge for the players to achieve.

Session Goal:
Come up with sufficient ideas

Game Goal:
Two teams compete to make their tree grows tall enough

Emotion Goal:
The experience of this challenge stimulates the players to feel fun and inspired

Creativity Techniques:



This challenge is based on a modular system. Every block includes one creativity technique and can be selected by the duration of the creative session and preference of the facilitator. Currently the block has the creativity techniques like the anti-problem, super power, criminal round and mission impossible. And it would still be extended in the future.

Also for the workable prototype, only the basic block have been built due to time mimitation. And the process using the basic block would be shown in Core Steps part.

Artifacts:

Except for commonly used artifacts, two artifacts are needed for this challenge:

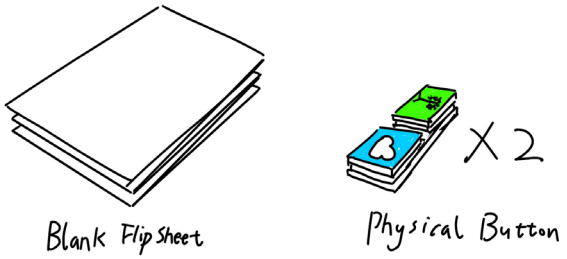


Figure 59. Artifacts for Challenge 2

The first one is the foldable flip sheet. The players are asked to put written ideas from one block to the one flip sheet. Then flip it for the next block.

The other one is the physical button box that includes a mini game controller. The box has two buttons for the whole team. One for written ideas and the other is for triggering the random stimuli card.

Type of Play:

In this challenge, the play is the team match. 4 players would be divided into 2 teams to compete with each other. Every team has two buttons. In the team, players can also discuss and come up with better quality ideas.

Mechanics:

Every round two teams would compete with each other for the height of the tree by continuously coming up with ideas. After every round, the team can see its progression then go to the next round.

The other mechanics is rewarding. For every team, they originally have 3 chances to use trigger words. And the more ideas the team come up with, they can obtain more chances of trigger words.

Another aspect of compensation cares about the quality of ideas. Because the goal of the game is to generate ideas as much as possible, the quality of ideas is hard to evaluate at that moment. Therefore the facilitator shall intervene to operate to make trees grow better if he or she think it's a good idea. Therefore the focus of the whole team won't be all on generating ideas as much as possible and still cares about quality.

Scenario:

The scenario shows the context that shows both operation area and digital screen.

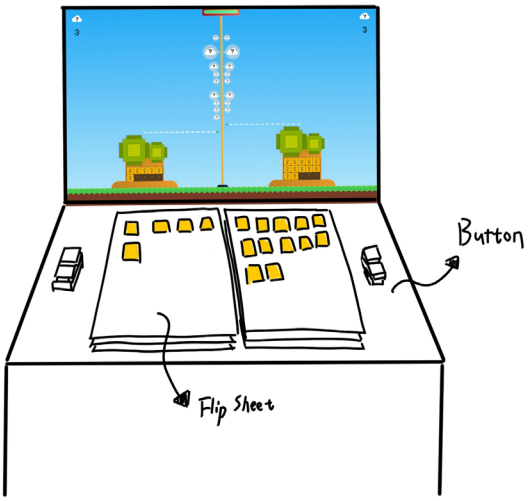
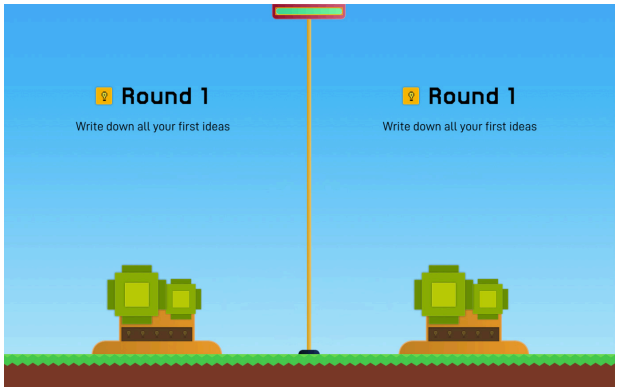


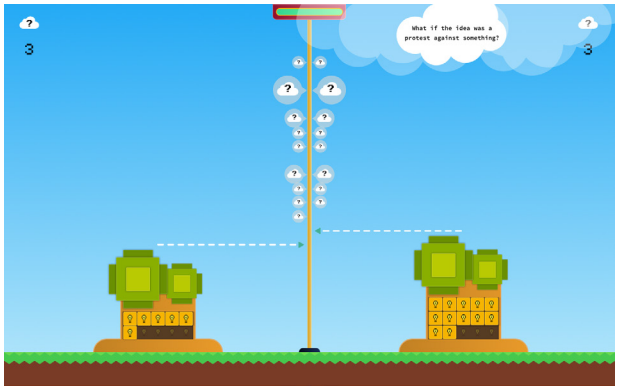
Figure 60. Scenario of challenge 2

Core Steps:



Step 1:

The two team write ideas to grow up their own tree within limited time. Every time they write down an idea then press the button, the tree would grow up a little.

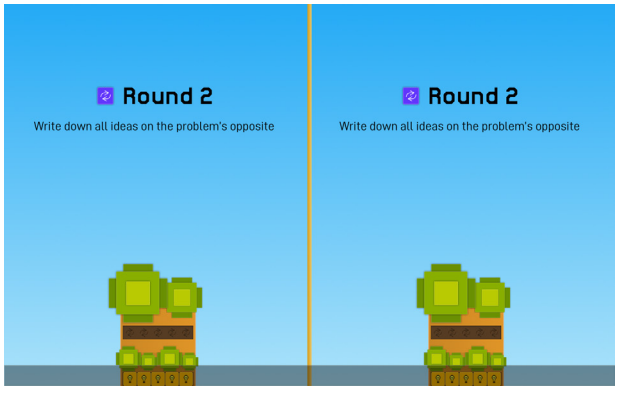


Step 2:

When the team run out of their inspirations, they can press the stimuli button to see random trigger words on the screen. Also with writing down ideas, more trigger chances can be obtained.

Step 3:

When time runs out, the team with higher tree wins.

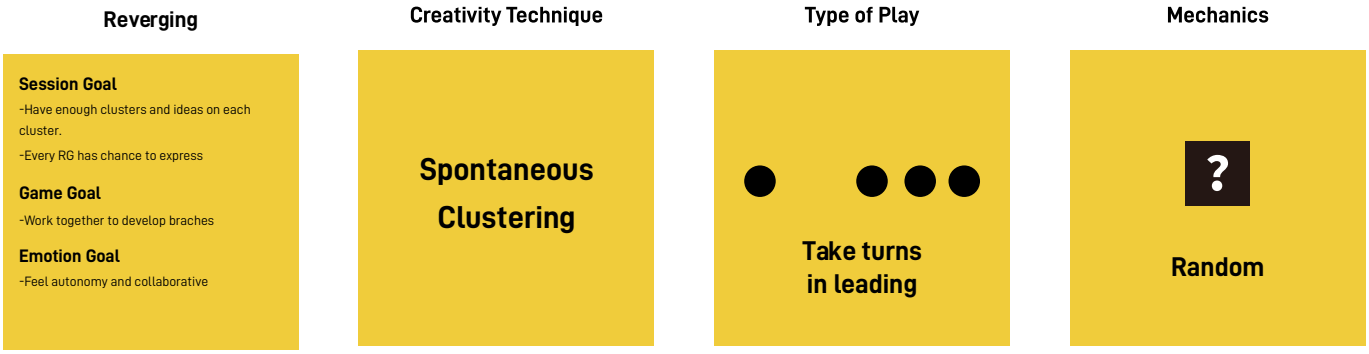


Step 4:

Another round applying different creativity techniques begines to stimulate players to come up with new ideas.

7.4.4 Challenge 3 - Branch Out

Here is the summary of game loop elements in the reverging stage



Goals:

There are three goals of this challenge for the players to achieve.

Session Goal:
Cluster ideas and give RG equal chance to express.

Game Goal:
Work together to branch out

Emotion Goal:
The experience of this challenge stimulates the players the sense of autonomy and collaborative

Creativity Techniques:

In this stage, spontaneous clustering is applied. This cluster will help the RG to gain a shared understanding and an overview of all options generated especially when a significant quantity of options is generated.

Artifacts:

Except for commonly used artifacts, two artifacts are needed for this challenge:

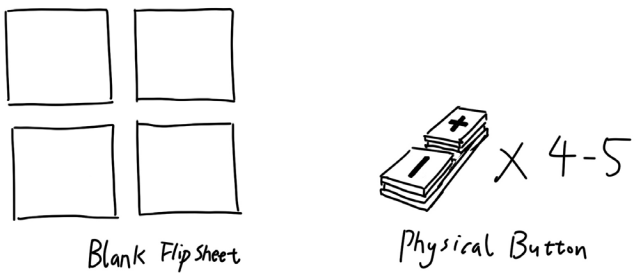


Figure 61. Artifacts for Challenge 3

The first one is the prepared flip sheet. For every cluster, it has at least one flip sheet to put ideas. The other one is the physical button. Each cluster has two buttons, plus and minus buttons to increase or decrease the amount of this cluster.

Type of Play:

In this challenge, the type of play is to take turns in leading the whole team to cluster. This idea comes from the fact that in the reverging phase for some RG they would actively act as the role of leader to cluster ideas but for the intrinsic people, even though they have a good ability of clustering, they don't have a chance to show it. Therefore the method of taking turns help every player has the chance to speak out. As the current leader, he or she would draw 6 random ideas and discuss with the other players. And the leader is responsible for pressing the buttons for each cluster.

Mechanics:

Random mechanics is added to this challenge. If only with taking turns to draw 6 ideas for clustering, the process would be linear and boring. Therefore, every time the player finishes the cluster, he or she would draw a function card, and the content of cards would be shown below:

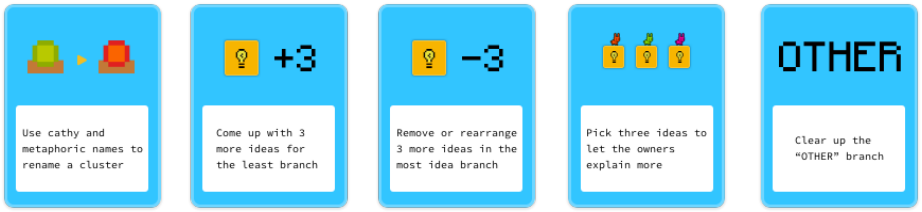


Figure 62. Content of function cards

Scenario:

The scenario shows the context that shows both operation area and digital screen.

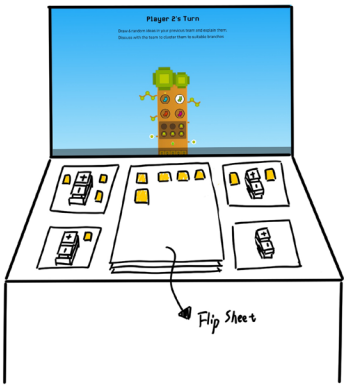
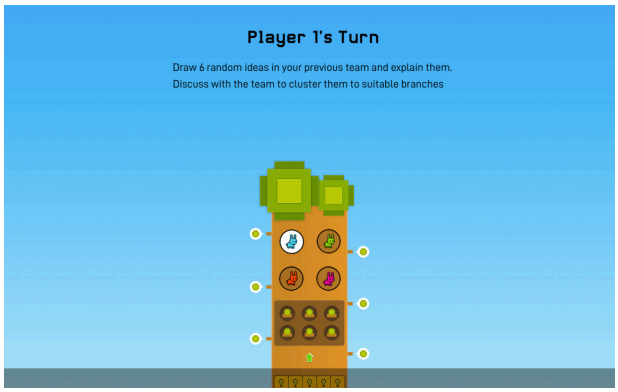


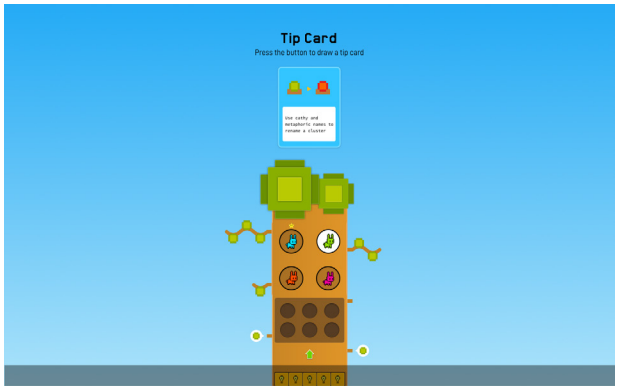
Figure 63. Scenario of challenge 3

Core Steps:



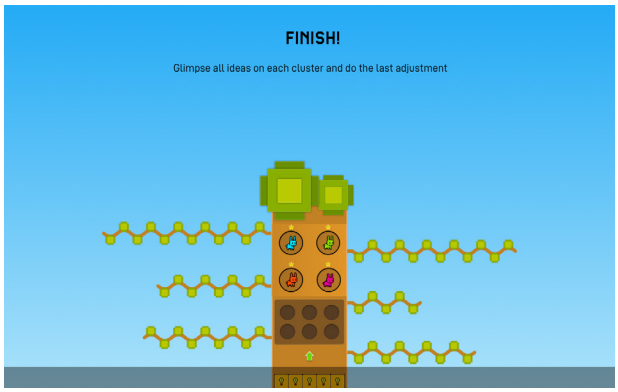
Step 1:

The player would be assigned 6 ideas based on digital screen. He or she picked 6 random ideas on the operation area and discuss with the rest of the player to put the idea to suitable branches by pressing the button



Step 2:

After clustering the idea, the player would draw a random function card. Based on the content of the card, the player would be asked to do different things like renaming clusters.



Ending:

After the cluster is finished, an overview of ideas distribution can be seen clearly on the screen.

7.4.5 Challenge 4 - Flourishment

Here is the summary of game loop elements in the converging stage

Converging	Creativity Technique	Type of Play	Mechanics
Session Goal -Choose best ideas and iterate ideas together. **Game Goal** -Evaluate the quality of the leaf -Put nutrient to grow the unique fruit **Emotion Goal** -Feel autonomy and collaborative -Feel sense of accomplishment	**Dot Voting** **C - Box** **SCAMPER**	 **Together**	 **Progression**

Goals:

There are three goals of this challenge for the players to achieve.

Session Goal:
Choose the best ideas and iterate them further

Game Goal:
Evaluate the quality of the leaf and put nutrients to grow up the unique fruit

Emotion Goal:
The experience of this challenge stimulates the players the sense of autonomy and collaborative, also accomplishment at the end

Creativity Techniques:

In this stage, in the first part C-Box creativity technique would be used to evaluate ideas with 2 criterias. In the second part, the creativity technique SCAMPER would be applied to continue iterating ideas in different ways.

Artifacts:

Except for commonly used artifacts, two artifacts are needed for this challenge:

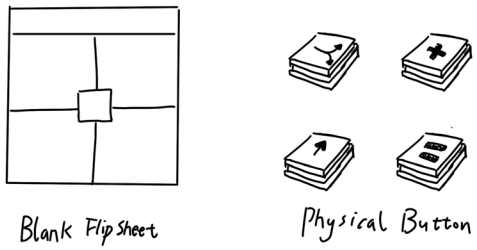


Figure 64. Artifacts for Challenge 4

The first one is the prepared flip sheet. For every chosen idea, it can be iterated with 4 different directions and the iterated idea would be put on the appropriate area. And every time the player put an idea on one specific are, he or she press button in that area.

Type of Play:

In this challenge, the type of play is to collaborate. In the first evaluation part, the players press buttons on the controllers to vote together. In the second evaluation part, the players can iterate ideas based on their own preference directions, but their scattered work can gather can the screen.

Mechanics:

Progression mechanics is used at iteration part. Every time the player iterate the chosen idea in different directions, the screen would offer different feedbacks directly to feel a sense of progression. But the final work of the fruit is the endeavor of everyone' work accumulating together.

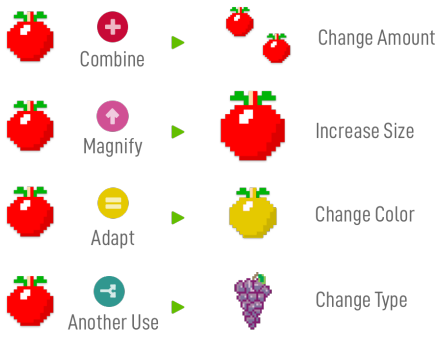


Figure 65. Setting of Fruit Iteration

Scenario:

The scenario shows the context that shows both operation area and digital screen.

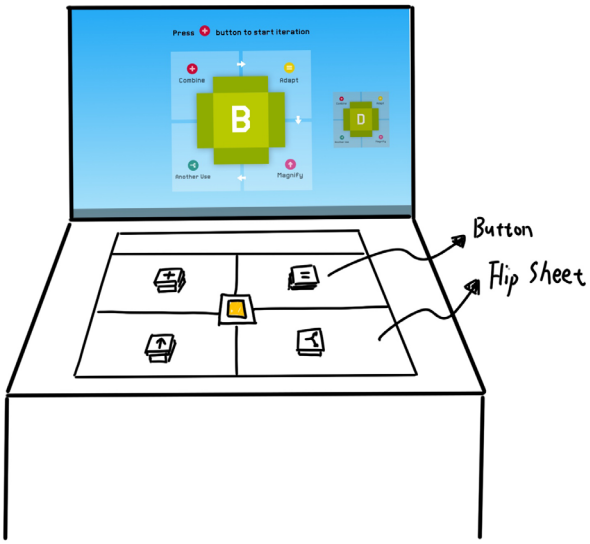
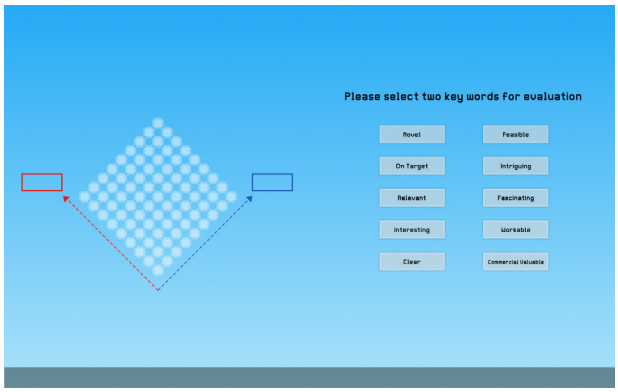


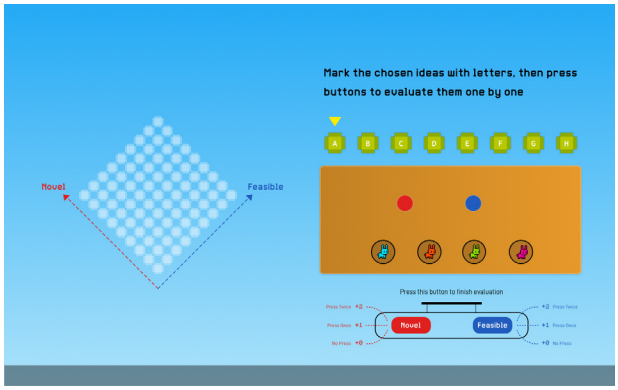
Figure 66. Scenario of Challenge 4

Core Steps:



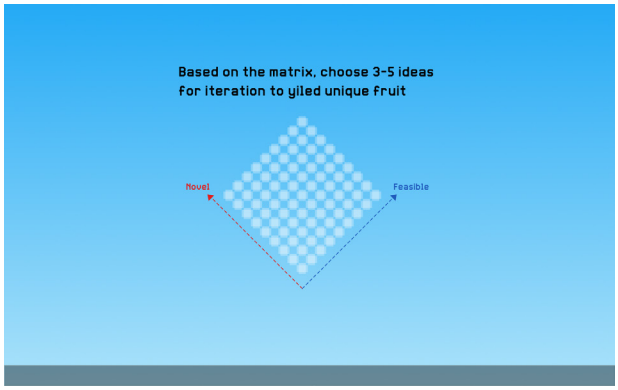
Step 1:

Before evaluating the chosen ideas, two key words of the matrix need to be sure. The key words can be novel and feasible, or requirements from clients.



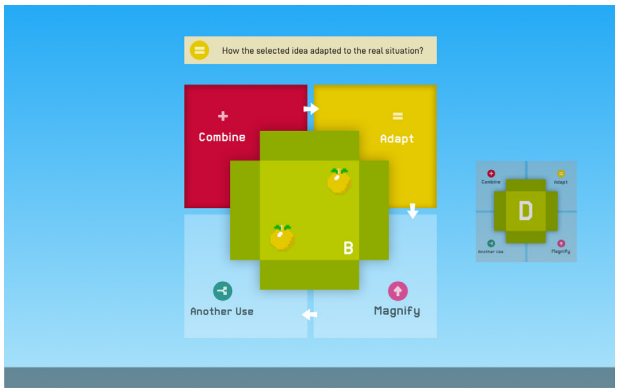
Step 2:

All the players evaluate individually and the final points of chosen idea is only shown when every player finishes the voting. And the voted idea would be put into the matrix.



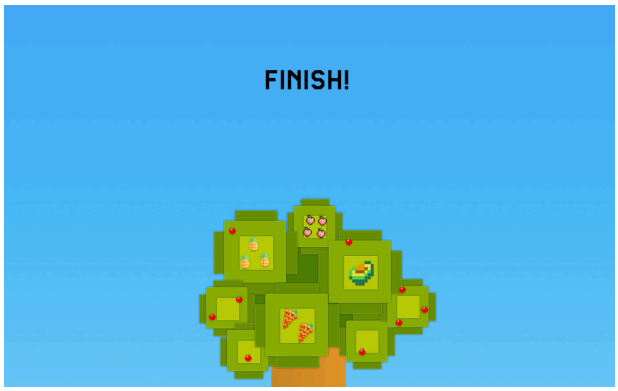
Step 3:

All the chosen ideas are put into the matrix. Based on the position of ideas, some of them continues to be chosen for later iteration.



Step 4:

In this part, the chosen promising idea would be iterated by players' preference. Each time the player makes an iteration, the condition of fruit in the middle would change.

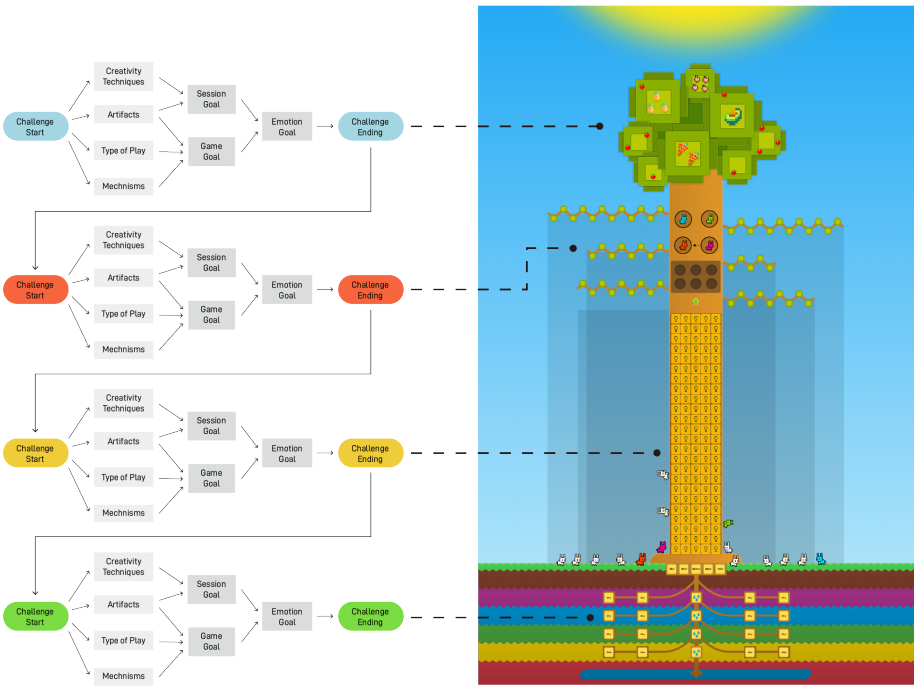


Ending:

The top of tree would pop out to flourshient and yield fruits that generates during the whole challenge.

7.5 Key Take-Aways Chapter 7

Step by Step to Final Design



This chapter mainly explicites the step by step transition from a rough framework to a complete detiled design concept. It focuses on two parts of the content: the development process of the toolset design, a detailed description of the final design.The toolkit was designed according to the design guidelines and the general creative session process. For the final toolkit, detailed step-by-step are provided for the corresponding artifacts and scenarios.

8. Evaluation

In this chapter

The chapter showed the process of an evaluation test performed with a group of employees at &RANJ to evaluate the game experience and its effect on engagement.

8.1 Introduction

In order to know to what extent the redesign could help to achieve the design goal of getting context related non-designers more committed to the creative session process? This study helped to build knowledge on the effect of gamification in creative session environments. The study served two main goals:

- Evaluate the gameplay experience and the effect of final design
- Evaluate the usability and feasibility of final design

These goals result in the following research questions:

1. To what extent and how does the gamification toolset reinforce the motivations of: fun, collaboration, autonomy?
2. To what extent does the gamification toolset help to the in-game actions of the resource group?
3. What usability problems would occur while interacting with the gamification toolkit?

8.2 Approach

8.2.1 Prototype

For the test, a final digital game was demonstrated. By connecting the laptop with four joy-cons, the screens of the game could be presented to the resource group.

Interaction with the game was accomplished by pressing buttons on the joy-cons. The content of the prototype was tailored to the process of a typical creative session which lasts the duration between 1.5 and 2 hours.

The prototype allowed the resource group to redefine problem, generate ideas, cluster ideas, choose ideas and iterate ideas within a consecutive story.

8.2.2 Participants

The participants are recommended to include two game designers and two context-related non-designers. And these two non-designers are better to be real clients. But if not, two employees working at &RANJ with their own problems are also recommended. And the graduate student acted as the facilitator for the creative session. Eventually two rounds of evaluation test have been carried out.

8.2.3 Method

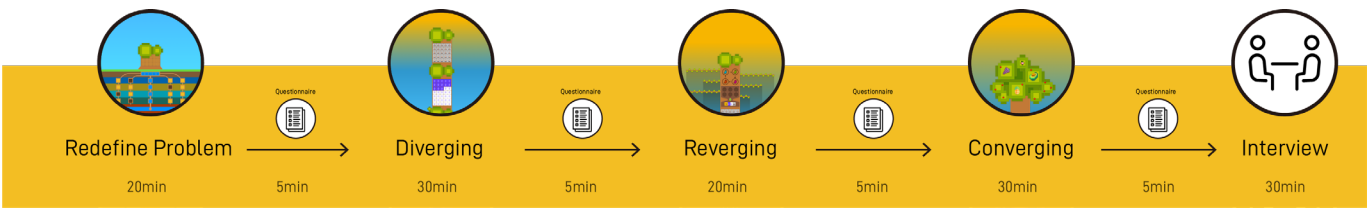


Figure 67. Planning of the test

To answer the three research questions, both qualitative and quantitative approaches were used. First, the gameplay experience of the resource group was assessed by observing the resource group while interacting with the final design with the instructions of the facilitator. In a semi-structured interview after the test, the gameplay experience of the resource group was further evaluated. Quotes and remarkable actions of the resource group were noted during the test.

The in-game actions of the resource group were also evaluated. The in-game performance and in-game objectives completed of the resource group were scaled via questionnaires and observations after each stage of the creative session (Siriaraya, 2018). Furthermore, after the test the user acceptance was tested to see if the gamification meets the needs of the stakeholders.

Even though the test mainly focused on the gameplay experience and completion status of each session stage objective, the usability was also quickly evaluated by observing the resource group while interacting with the gamification toolset. Quotes about usability were noted during the test for further evaluation.

The material for the questionnaire and interview are shown in appendix K.

8.3 Results

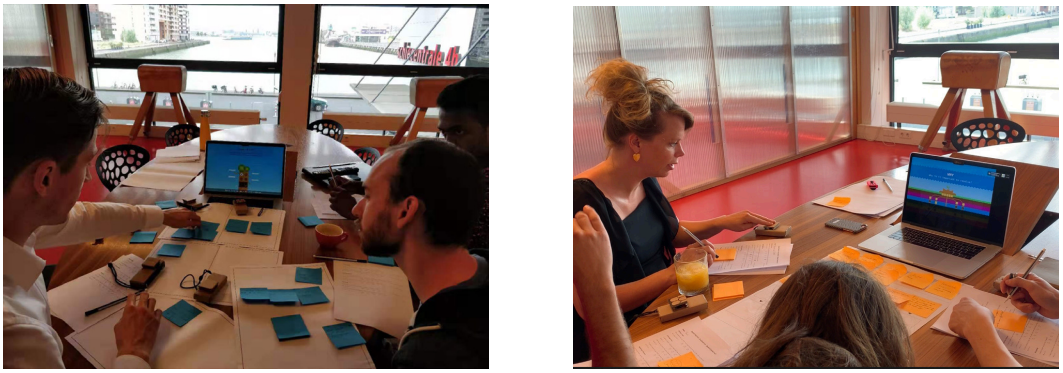


Figure 68. Process of the test

The test results are shown in three aspects.

- The first aspect is to indicate to which extent the test result is positive to fulfill the desired design goal.
- The second aspect is to indicate with the intervention of game experience, what in-game actions came out to have an impact on the creative session process.
- The third aspect is to indicate the usability of the gamified toolkit design in the evaluation test.

1 Result - Fulfillment of Design Goal: Positive!

To what extent does the design meet the goal of helping the players with diverse backgrounds get committed to the creative session in a fun, collaborative and autonomous way?

Fun

After the evaluation test, the final design was considered fun by all 7 participants and the related quantitative data is shown in the following graph.

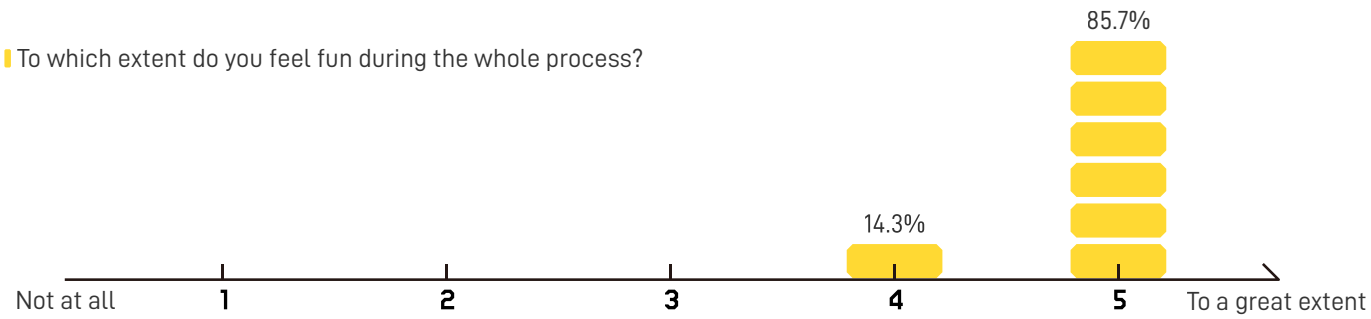


Figure 69. Quantitative result for fun

The final design was considered attractive and fun by most players for its pixelate visual style, game sound, cute characters in the games. From the feedback, one player thought the visual style was a little "childish" and not applicable to all adults. Therefore there could be a change to make the story and visual style more fit for adults.

Relevant Quotes

"I think it is interesting, which makes it more interactive and it's a bit more fun. "

"I love the story of bunnies and their voice."

"The visual style is cute and intimate for me."

"I mean, if we are just humans, building a tree, it wouldn't have worked for me as well. But I like bunnies. I was invited to a magical circle."

Collaborate

The final design was perceived as fitting the design goal of stimulating players collaborating together. The comments received showed that the final design could help players build more intimate connections with others. The extent of collaboration was measured by two related questions and the quantitative data is shown in the following graph.

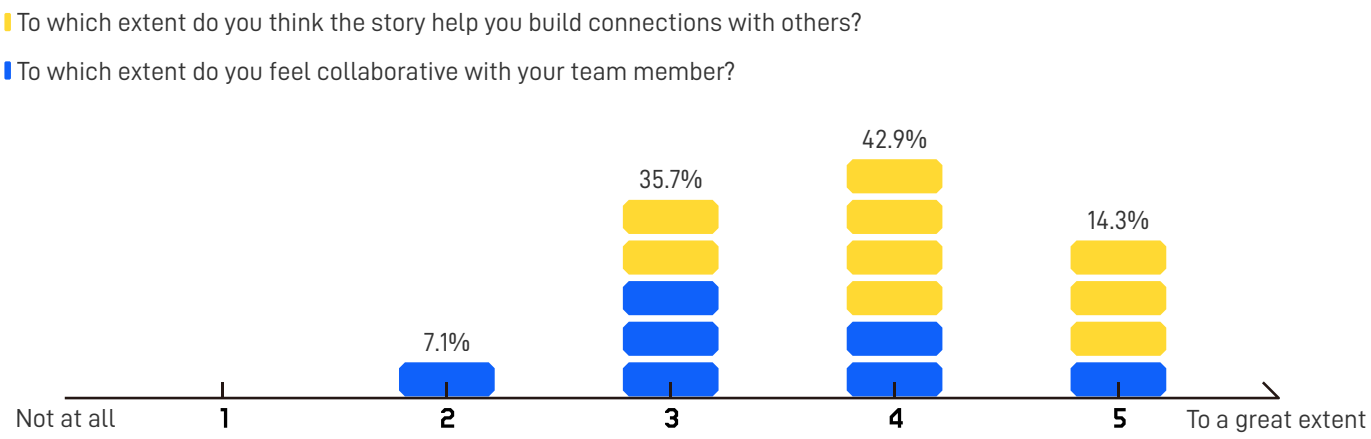


Figure 70. Quantitative result for collaborate

From the feedback of players, generally they could feel the sense of collaboration in different parts of creative session process. In the part of the team competition, although it's a competition between the two teams, most players felt collaboration with their team members.

Relevant Quotes

"Usually, when you're in a group session, there's going to be people there that maybe haven't met, so it's important that these people are, you know, in sync with each other. And the introduction story can sort of helping that."

"Let's pretend we're rabbits. Yeah.Let's help each other. I think that worked really well. You have my compliments."

Autonomy

The feedback from the players showed that they generally felt more self-control using the gamified design tool compared with the creative session they participated before. And the extent of collaboration was measured by three related questions and the quantitative data is shown in the following graph.

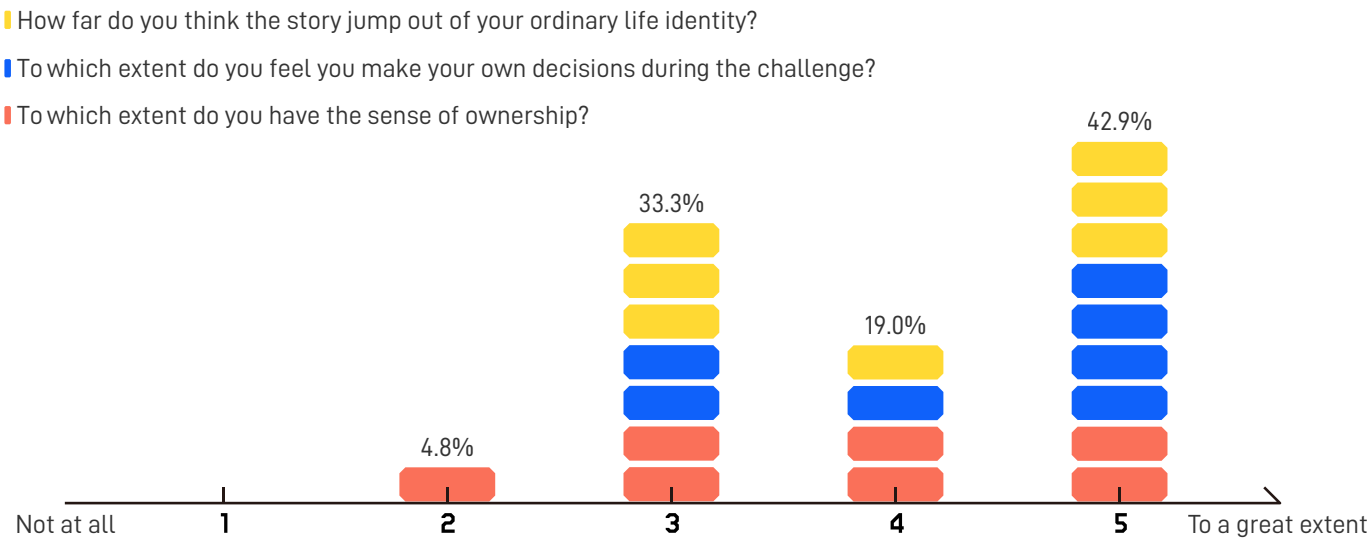


Figure 71. Quantitative result for Autonomy

Although a considerable part of remarks are 3 points, overall the result is still positive. Using the design tool, some players reflected they had more chances to speak out their own ideas and shared with other players.

Relevant Quotes

"It feels we are all at the same level."

"But I think it's definitely good to have your own identity in the game. Yeah. And to see the different characters in the game evolving together as well."

"Now I can speak out the idea because of the mechanism that let every player has an equal chance to speak out."

2 Result - Game Made a Difference in Creative Session

What actions would change or come out in the creative session process after using the gamified toolkit? Positive or negative?

Pressing buttons worked

Compared with a normal creative session, when using the gamified toolkit, more interactions are needed to execute like pressing buttons. And there is a question behind it: **would the interactions in the gamified toolkit increase burden to the players?**

Although in the design iteration phase the graduate student has put some effort to help relieve the burden of extra interactions, the final effect was still unknown before the evaluation test. Finally after the evaluation test, from the feedback of players the result was actually much more positive than expected. From the observation of the graduate student, the players were able to press the buttons actively without any instructions.

Relevant Quotes

"I like to make use of the controller and the screen with bunnies."

"It feels like, bam, I got an idea gives you like a mini rewards for yourself. Feels good, too. Yeah, check it off, you know, and you see a progression and I feel empowered."

"I like that you could press the button for every idea. It's kind of motivated me. "

Proper competition resulted in wildness

The team competition helped speed up the creative session process and the players were more willing to come up with stupid things to increase the amount of idea blocks on the screen. Also the competition itself was fun and not too competitive for the players.

Relevant Quotes

"I am not afraid of coming up with stupid ideas."

"The current competition is enough to be fun and not too much to be aloud."

The mechnism of taking turns as leader is promising but needs further development

The mechanism of taking turns in leading the team in the reverging phase is expected to offer every player an equal chance to speak out their own ideas and cluster it. It is reasonable in theory, but in the evaluation test, the result was not as good as expected. The main reason is that when one player worked as a leader, the rest players didn't actively join and help the leader. The expected situation didn't come out and the mechanism of taking leads didn't work. But for some players, they already saw the potential of this mechanism and offered some suggestions. And the improvement would be shown in the recommendation part.

Relevant Quotes

"Taking the lead is like playing a card game. It can help control the time and avoid unnecessary discussions."

"The person is doing it, we are just watching."

"Except for the leader, the others don't have a strong feeling to participant.

Feel the leader just makes her own choice."

Voting System helped players honest to their thought

The voting system performed much better than expected. Everyone had the chance to choose ideas they like and not be influenced by others. And after finishing voting, they expected the final grade to come out. Also the matrix was clear and participants could easily have an overview of the positioning of all selected ideas.

Relevant Quotes

"You get more honest answers from everybody."

"Otherwise, you might think, oh, I don't know, I feel this way. But what this guy says, it sounds really logical. So I'm just gonna follow him."

"Because it's, you don't know what the other people voted. Yeah, you're not influenced by other people to vote. The vote is shown at the end. And it's on each side individually, which when you focus on each side individually. So I think that's the best approach. "

The story contributed to formulating a magical circle for players

After several iterations of story narratives, the story was determined and waited to be tested in the evaluation test. From the feedback of the players, the story helped them jump into a magical circle and think they are working for themselves instead of for others. And the story is highly related to the design goal of collaboration. Players reflected that in the story they felt they were at the same level and were ready to accomplish tasks together.

Relevant Quotes

" it is interesting that I wouldn't think it was for working on &ranj's work but I work for myself."

"The phases are easy to understand under the story of growing up a tree."

3 Result - Usibility of the Toolkit Still Needs Improvement

What usability problems would occur while interacting with the gamification toolkit?

Part of instructions were not clear and accurate enough

In the different parts of the creative session process, the players mentioned they encountered some confusion and the main reason was that " sometimes the instructions were not clear and accurate enough". Although with the help of the facilitator, the players could understand what they ought to do but there is still room for improvement.

Relevant Quotes

"There is a way to be more clear with questions."

"The timer is not evident enough."

"Not clear about the responsibility of the acting facilitator"

Excessive feedback caused adverse effect

Proper feedback can increase participantion for the creative session, but from the result of evaluation test , excessive ones caused adverse effect. In the phase of reverging, after each round the player would receive a task card. Only when finishing the task, then the whole process could move on. When experiencing this part, some players mentioned in part the visual and feedback were too much and gave them the illusion that this was not a compulsory task but a bonus reward. And after realizing it was a task, they felt disappointed at the moment.

Relevant Quotes

"You get more honest answers from everybody."

"Otherwise, you might think, oh, I don't know, I feel this way. But what this guy says, it sounds really logical. So I'm just gonna follow him."

"Because it's, you don't know what the other people voted. Yeah, you're not influenced by other people to vote. The vote is shown at the end. And it's on each side individually, which when you focus on each side individually. So I think that's the best approach. "

8.4 Key Take-Aways Chapter 8

Setup of Evaluation Test

In the evaluation test, the players with diverse backgrounds including game designers, developers, project managers and researchers were invited to join a complete creative session using the gamified toolkit. The evaluation test were conducted two rounds and for each round. The players were asked to fill in a questionnaire after finishing each phase and take an interview after the evaluation test.

Fulfillment of Design Goal: Positive!

The test results were positive to fulfill the design goal of helping players get committed to the creative session process in the fun collaborative autonomy way. Compared between these three main criterias of the design goal, players perceived them to different extents. Fun is the most to be perceived by players and collaboration is in second place then autonomy is the least. So there is space for improvement of the gamified creative session toolkit.

Game Made a Difference in Creative Session

With the intervention of game experience, some in-game actions have come out or change in the creative session process. And these newly actions have the potential to change the current process of creative session

Usibility of the Toolkit Still Needs Improvement

From the evaluation result, part of instructions in the toolkit were not clear and accurate enough. Besides, part of feedbacks in the game were overwhelming. The improvement for these issues would be put into the recommendation part in next chapter

9. Discussion

In this chapter

In this chapter, limitations to the project and design recommendations for further development are mentioned. Also implementation recommendations are proposed including the value of the toolkit, the cost / benefit analysis and a roadmap for further development. At the end, a personal refelction is present.

9.1 Limitations

This section introduces the limitations in the process of designing the gamified toolkit.

Limitation in the perspective of facilitators

The design goal of the final design is to improve creative session engagement for participants and the design focus is to design a game experience for the participants. Therefore the graduate student paid the most attention to building a game experience for the participants in the creative session. But due to the limitation of time, the perspective of facilitators wasn't cared about so much. The operation end for facilitators using the gamified creative session toolkit still has huge space for improvement.

Limitation in the validation of the toolkit

Although the graduate student has tried to make the final prototype be able to offer 100% gamified creative session experience to the participants, some parts in the final design still needs additional introductions and guidance from the facilitator. Therefore the feedback from participants cannot fully represent the complete performance of the prototype.

Also in the evaluation test, the final result is the synthetic work of facilitators, players and the gamified toolkit. So it's hard to pick the gamified toolkit up separately and only evaluate the value of the toolkit itself.

Limitation in the iteration based on exploring why

In the iteration phase, the design concept is iterated several times based on the feedback from players and insights from the research. However, the fact is that in order to design the whole game experience which players can feel, there were so many decisions that the graduate student needed to make. And not every decision could find a reason or have a reference to explain it and some decisions were made based on the experience of the graduate student, . Finally in the evaluation test, part of the decisions were proven to be correct and others were proven to still need to be adjusted. And the adjustment would be shown in the recommendation section.

9.2 Design Recommendations

Based on the result of the evaluation test, recommendations for further development are given as follows.

Strengthen the connection between physical activity and digital screen

In the current design, the operation area and digital screen are divided. Although during the iteration phase, the graduate student has tried to optimize it like adding game sound as connections, for some specific operations, the players still felt that the interaction was not fluent enough. Therefore for the future development, the materials for the physical activity could be more intimate with the content of the digital screen.

Include more creativity technique into the toolkit

In the current gamified creative session toolkit design, only several creativity techniques were selected based on the research result to deeply gamified for arousing players' intrinsic motivation. And for some creativity techniques which are also prevalent in current creative sessions, they also have the potential to be gamified.

Improve the compatibility of the gamified toolkit

For the feasibility and completeness of the workable prototype, the current gamified toolkit serves for a fixed amount of players in a fixed length of period. But for the future development, the amount of players and the length of the creative session shall be adjusted by the requirement of facilitators to able to cope with most creative sessions.

Give room for going around

The narrative in the game is linear, but the creative session is not. From the feedback of players, it was good to have clear guidance for them. But there should be some room for them to go around or do the part again if they think the current result is not as good as expected. For instance, instead of starting voting for ideas directly, a pitch and discussion between players could be included to have enough time to get familiar with each other's thoughts.

Get involved in all players with appropriate mechanism

In the part of reverging, the mechanism of taking turns to cluster ideas didn't perform as well as expected. When one player acted as an acting facilitator, the others didn't actively participate in the player's clustering process. The reason behind it is that the gap between each player was too long and the ideas they draw were not what they are familiar with. Therefore the mechanism is expected to adjust to faster frequency (3 ideas per player) and the player only choose ideas they are familiar with which they could explain to others.

9.3 Implementation Recommendations

9.3.1 Value of the Gamified Toolkit

There are several values for this gamified creative session toolkit.

Increase creative session engagement

It has been proved in the evaluation test that this toolkit can help participants better committed to the creative session process. To be more specific, the gamified creative session toolkit could help participants with diverse backgrounds jump out their own ordinary life identity to collaborate together to take an open-ended challenge in a fun way.

Player-centered creative session

The gamified creative session toolkit makes players become the leading role instead of facilitators. Although facilitators are still needed in the creative session, within the step by step guidance of the gamified toolkit, the facilitators are able to focus more on group dynamics and the players take the place of control and participate more actively via the direct interactions with the digital screen.

Ideal way to exhibit the value of gamification

The value of this gamified creative session toolkit is not merely constrained on the creative session itself but also for the branding of &ranj. Considering that the participants in &ranj's creative session are mostly clients or experts, the enjoyable game experience of the creative session is an ideal way to let them better acknowledge the value of gamification and the relevant professional level of &ranj. From the long-term perspective, the gamified creative session toolkit consolidates relationships with existing clients and broaden possible corporations with potential clients.

Overall, this graduation project rips a crack for the revolution of creative sessions. It's predictable that in the future creative sessions would become more digitized and more immersive. Anyone anywhere can enjoy the burst of creativity with others in a playful way.

9.3.2 Value Proposition

In order to popularize the gamified toolkit into the real context of creative sessions, the value of the gamified creative session toolkit has to be clearly communicated to stakeholders using the Value Proposition Canvas (Strategyzer, 2016). The model shows the value of gamified toolkit could be framed in multiple perspectives. It doesn't only increase creative session engagement for participants, but also an ideal method to show stakeholders the value of gamification in a highly interactive way.

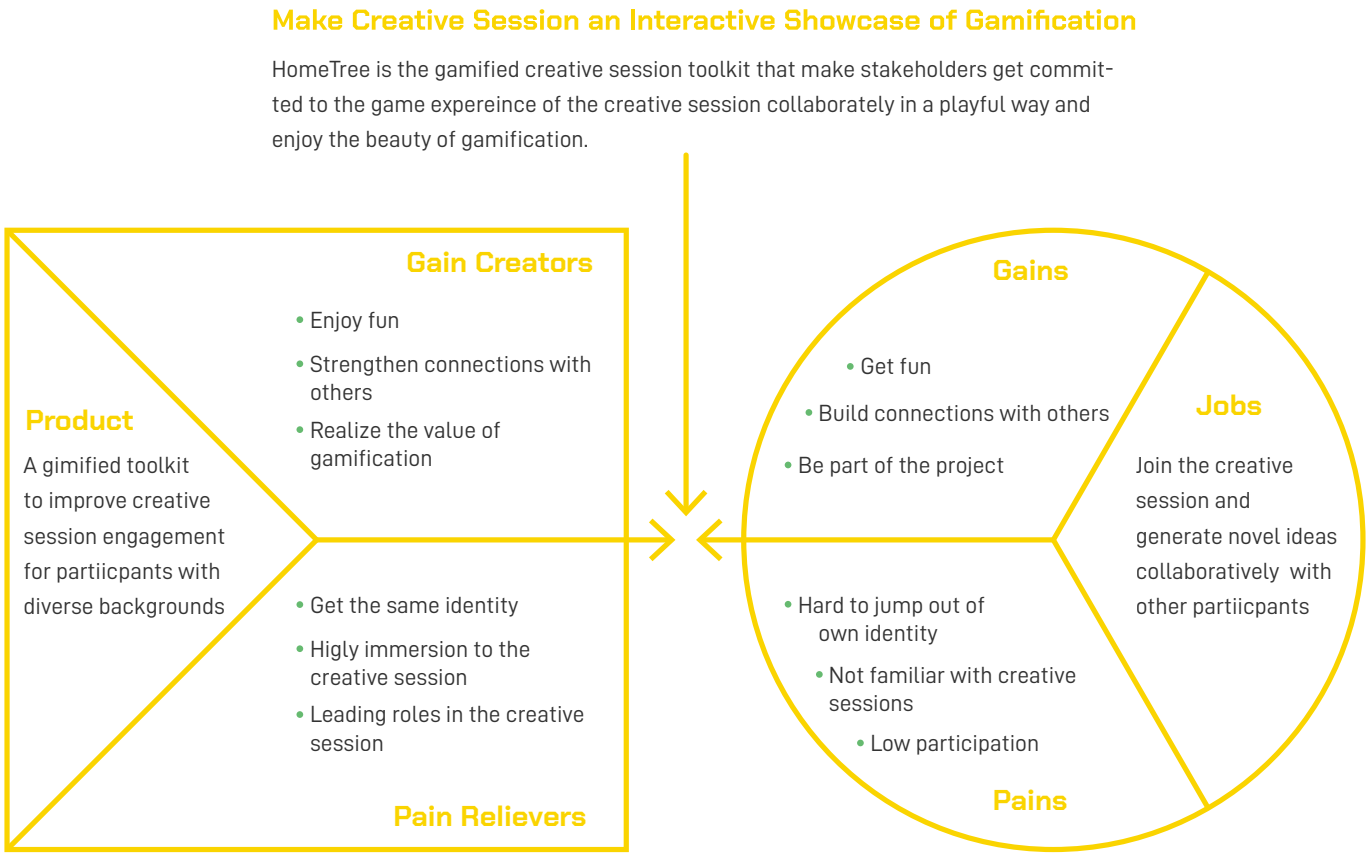


Figure 72. Value proposition of the gamified toolkit

9.3.3 Cost and Benefit Analysis

The value of the gamified creative session toolkit is clarified. And accordingly the cost of creative session also increases because of the newly toolkit. Considering that the current design is still a prototype, it's hard to evaluate the cost in the real commercial context. But compared with an ordinary creative session, these appliances are needed:

-A laptop;

-Projection or TV (optional);

-Paper material;

-Physical buttons that can connects laptops;

In general, laptop and projection（or TV） are the basic appliance in the office circumstance which don't need to purchase again. Only paper material and physical buttons are purchased in extra. And compared with the extra cost, the value of the gamified toolkit exceeds much to that. Overall the current gamified toolkit is a feasible solution in the perspective of cost and benefit.

9.3.4 Roadmap for Future Development

To increase the probability of acceptance, a roadmap for a gradual strategy is advised. There exists three horizon.

Development Horizon

In the development horizon, it is mainly about how to develop the graduate student's prototype design into a commercial product.

- First the final gamified toolkit will be further evaluated to improve its usability for players. Considering that the gamified creative toolkit includes four stages in the creative session, many design details could be adjusted in the usability test.
- Second, it's advised to design the operation end for facilitators. The current toolkit design considers the participants most. In the perspective of facilitators, the operation still needs to be improved and more friendly.
- Third, since the current toolkit serves for a fixed amount of people in a fixed length of time, it is advisable to be flexible on the amount of players and the length of time. And after finishing this stage, the gamified toolkit design can be promoted to related clients and companies.

Branding Horizon

In the branding horizon, via applying the gamified toolkit to organize creative session with clients, &RANJ can exhibit its professional level in gamification domain and increase possibilities for future collaboration. Finally, the brading identity of &RANJ in the domain of creative session expands.

Customization Horizon

With sufficient branding identity in the domain of creative sessions, &RANJ is advised to offer customization service to help solve the problem in a specific domain via the gamified toolkit involving suitable creativity techniques, story and mechnisms to make a profit.

VISION 2020

&RANJ in 2020 will provide a full range of customized gamified creative session services for different fields of clients

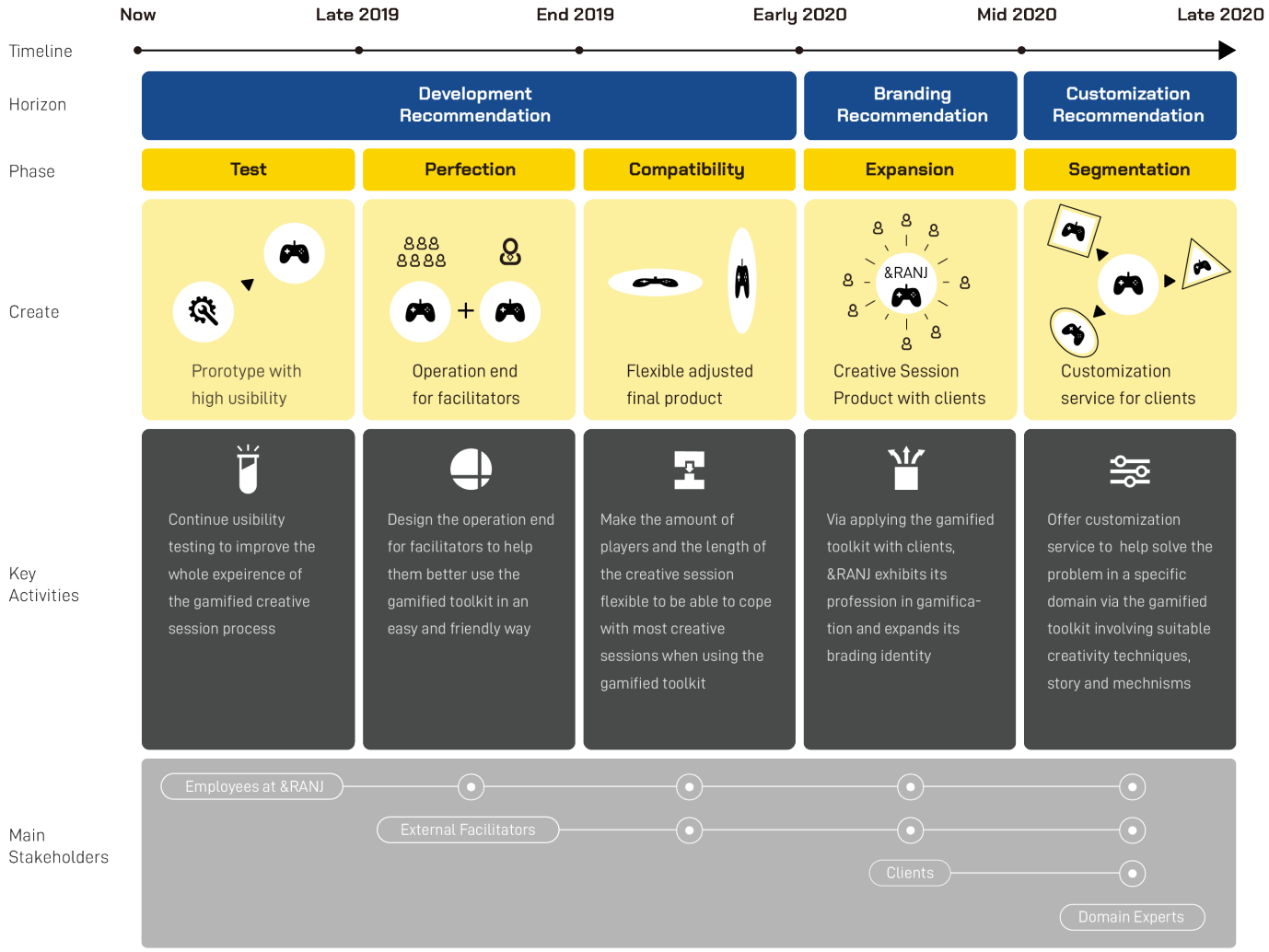


Figure 73. Roadmap for future development

9.4 Personal Reflection

Designing a game was a very special experience for me. Although my interest is on creating playful experience, I haven't got a formal chance to design a real game. And this graduation project gave me the opportunity to make my game dream come true. During the process, I tried to play different games and got good advice from my two game designer mentors. And I like the completeness of my final game.

In this graduation project, I have encountered two main difficulties.

The first one is how to take in others' opinion. During the whole project, I received diverse feedback from mentors, friends and testers. Some of them are suggestions, some of them are opinions and some of them are just feelings. Sometimes I got lost in these overwhelming feedback, especially negative ones. When I received these negative feedbacks, I would think if I shall turn around to try another direction or stick to the current direction to prove I was right. Until now I still will feel tortured when encountering that but during this process, I gradually built my own judgment system. The system didn't work all the time but it truly helps me better digest others' feedback.

The second difficulty for me is to make decisions. Because my goal in this project is to make a complete workable prototype , I need to care about so many details thus needing to make so many decisions. But not every decision can find a reference or a test result to support it. And I had to make some decisions by my own experience and undertook the risk of failure. It's also torturing, but eventually helped me build confidence for my project.

A great achievement for me is to learn how to program which I hadn't tried before. In order to make a complete workable prototype, I spent lots of time to learn to code and debug it. Sometimes I would doubt if it's worthwhile for me to spend so much time on coding that is out of a designer's profession scope. But... who cares... it always feels good to learn something new and not everything I do needs to be "meaningful" for me. Finally, I made my prototype complete workable and it's a great delight for me.

In general, I would say this project was very valuable and meaningful to me because it brought me to the field I was always interested in and pushed me to learn new things like programming to make it work. It's definitely a unique learning experience and memory for me. I have already missed this five-month time:)

Reference

Bakker, A. B., Schaufeli, W. B., Leiter, M. P., & Taris, T. W. (2008). Work engagement: An emerging concept in occupational health psychology. Work & stress, 22(3), 187-200.

Campbell, J. (2003). The hero's journey: Joseph Campbell on his life and work (Vol. 7). New World Library.

Christian, M. S., Garza, A. S., & Slaughter, J. E. (2011). Work engagement: A quantitative review and test of its relations with task and contextual performance. Personnel psychology, 64(1), 89-136.

Csikszentmihalyi, M., & NewYork, N. Y. (1990). Harper and Row. Flow: The psychology of optimal experience.

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2014). Du game design au gamefulness: définir la gamification. Sciences du jeu, (2).

Deci, E., & Ryan, R. (2004). Handbook of self-determination research . Rochester, NY: University of Rochester Press.

Drucker, P. (2014). Innovation and entrepreneurship. Routledge.

Gray, D., Brown, S., & Macanufo, J. (2010). Gamestorming: A playbook for innovators, rulebreakers, and changemakers. " O'Reilly Media, Inc.".

Grbich, C. (2012). Qualitative data analysis: An introduction. Sage.

Ishii, H., & Ullmer, B. (1997, March). Tangible bits: towards seamless interfaces between people, bits and atoms. In Proceedings of the ACM SIGCHI Conference on Human factors in computing systems (pp. 234-241). ACM.

Klabbers, J. H. (2009). The magic circle: Principles of gaming & simulation. Brill Sense.

Kultima, A., Niemelä, J., Paavilainen, J., & Saarenpää, H. (2008, November). Designing game idea generation games. In Proceedings of the 2008 conference on future play: Research, play, share (pp. 137-144). ACM.

Kultima, A. (2015, September). Game design research. In Proceedings of the 19th International Academic Mindtrek Conference (pp. 18-25). ACM.

Mumford, M. D., Reiter-Palmon, R., & Redmond, M. R. (1994). Problem construction and cognition: Applying problem representations in ill-defined domains.

Naydonova, L. (2003, May). Energizer-Group as a Training Procedure for Intervention in Organizational Culture. In The report of XI European congress of Work and Organiza tional Psychology (pp. 1-6).

Nicholson, S. (2015). A recipe for meaningful gamification. In Gamification in education and business (pp. 1-20). Springer, Cham.

Nyström, H. (1979). Creativity and innovation. John Wiley & Sons Inc.

Parker, Jeanette; Begnaud, Lucy (2004). Developing Creative Leadership. Portsmouth, NH: Teacher Ideas Press. p. 20. ISBN 978-1563086311.

Rickards, T. (1974). Problem-solving through creative analysis. Wiley.

Sawhney, M., Verona, G., & Prandelli, E. (2005). Collaborating to create: The Internet as a platform for customer engagement in product innovation. Journal of interactive marketing, 19(4), 4-17.

Schell, J. (2014). The Art of Game Design: A book of lenses. AK Peters/CRC Press.

Siriaraya, P., Visch, V., Vermeeren, A., & Bas, M. (2018). A cookbook method for Persuasive Game Design. International Journal of Serious Games, 5(1), 37-71.

Tassoul, M., & Buijs, J. (2007). Clustering: An essential step from diverging to converging. Creativity and Innovation Management, 16(1), 16-26.

Treiman, D. J. (2014). Quantitative data analysis: Doing social research to test ideas. John Wiley & Sons.

Tyni, H., Kultima, A., Nummenmaa, T., Alha, K., Kankainen, V., & Mäyrä, F. (2016). Hybrid Playful Experiences: Playing between Material and Digital-Hybridex Project, Final Report.

Villar, N., Cletheroe, D., Saul, G., Holz, C., Regan, T., Salandin, O., ... & Zhang, H. (2018, April). Project zanzibar: A portable and flexible tangible interaction platform. In Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (p. 515). ACM.

Ward, T. B. (2004). Cognition, creativity, and entrepreneurship. Journal of business venturing, 19(2), 173-188.

Appendix

Appendix A
Questionnaire Script for Creative Session

Hey:)

welcome to the tree hole

They say in ancient times, people go into the mountains and the forests to find a tree hole, and tell the tree hole their secrets.

Today here is a tree hole for you to pour out the shinning points or pitfalls you have encountered in the creative sessions. The process is expected to last less than 10 minutes.

Hi I am Zhe Duan, whose head was full of creative sessions recently:P

Can you also introduce yourself in one sentence?

Have you ever been a facilitator for the creative session?

-Yes!

-Nope

-I guess

How many times have you facilitated?

-1 - 5

-6 - 10

-> 10

How do you evaluate your level of creative facilitation?

-Have no idea what to do!

-Know basic creative facilitation methods

-Use basic methods to facilitate sessions

-Apply appropriate methods to different phases of sessions

-Deal with diverse practical situations happening in sessions

-Guide participants to the suitable mindset flexibly in different phases

This is the visual flow of a typical creative session. Based on this flow, recall the moments when you were facilitating in a creative session

When facilitating, in which phase have you felt most confident?

Introduction

Redefine Problem

Divergent

Emergent

Convergent

Wrap Up

What's your secret of success when facilitating at the phase of ?

When facilitating, in which phase have you felt most frustrated?

Introduction

Redefine Problem

Divergent

Emergent

Convergent

Wrap Up

What's your reflection of failure when facilitating at the phase of

Now... turn around.

Recall the moments when you were a participant in creative sessions.

As a participant, in which phase have you felt truly unsatisfied?

Introduction

Redefine Problem

Divergent

Emergent

Convergent

Wrap Up

What unsatisfying thing happened at the phase of?

As a participant, in which phase have you felt pretty awesome?

Introduction

Redefine Problem

Divergent

Emergent

Convergent

Wrap Up

What awesome thing happened at the phase of ?

That's the end!

Do you have any additional comments to share about creative session topic?

Thanks for your patience:)

If you are still interested in my graduation topic, could you leave your email for a possible little talk in the future?

share link:

https://yujing286002.typeform.com/to/vBHCvT

Appendix B

Material for Interview at &RANJ

Interview for &RANJ's Creative Session

Interviewee: *Date:*

Today I will do a short interview with you to get a better understanding of how &ranj's creative session works.

At first I would ask you some questions to help me have an overview of &ranj's creative session.

1 What kind of problems did you usually solve in the session? Can you list some problems?

2 Which roles would be involved? Usually how many people?

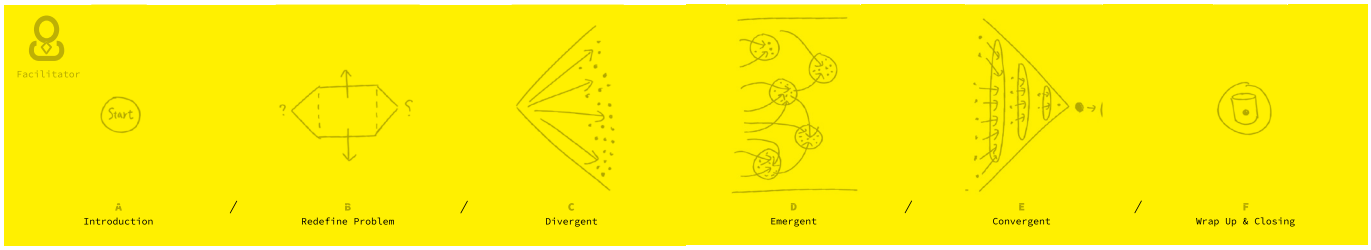
3 How long usually would it last?
Do you think if it's appropriate for you?

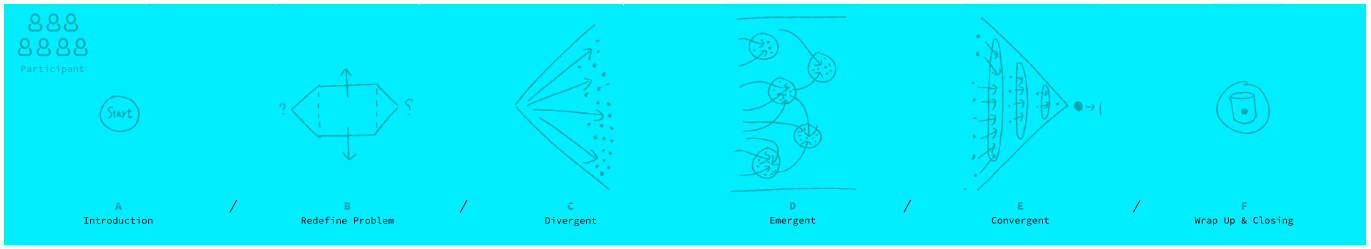
4 Do you think what's the main objective of organizing creative sessions?

5 Do you think current sessions have done a great job on the main objective?

6 Can you describe your most impressive experience of creative session as a participant and a facilitator respectively?

OK, I think I am more clear about &ranj's sessions now. Then let's go to the next part: the process of &ranj's creative session


Facilitator
Start
A
Introduction
/
B
Redefine Problem
/
C
Divergent
D
Emergent
/
E
Convergent
/
F
Wrap Up & Closing


Participant
Start
A
Introduction
/
B
Redefine Problem
/
C
Divergent
D
Emergent
/
E
Convergent
/
F
Wrap Up & Closing

Appendix C
Digitization of Collaborative Working

Nureva Wall: Solutions for Collaborative Teams

Cellphone as Artifact

Instead of using post-it for writing ideas, the resource group used their own cellphone typing ideas on the digital Post-it. The functions of connecting cellphones with the board and sending post-its through network worked very smoothly. But also what needs to be mentioned is that when using the cellphone as post-it, all resource group main focus on their cellphones and the communication between the group evidently decreased.

Rich Interactions

After typing ideas on the cellphone, the session went to the second phase that resource group uses the big touch board to cluster and finalize their ideas together. At this phase, the resource group were evidently more devoted to the session via touching, sliding, grouping and drawing ideas on the board.

After typing ideas on the cellphone, the session went to the second phase that resource group uses the big touch board to cluster and finalize their ideas together. At this phase, the resource group were evidently more devoted to the session via touching, sliding, grouping and drawing ideas on the board.

Waterfall Result

After the session, the whole result on the board would be saved as the form of waterfall flow on the cloud. Later, for future development, the resource can easily edit the document via their own cell phones or laptops.

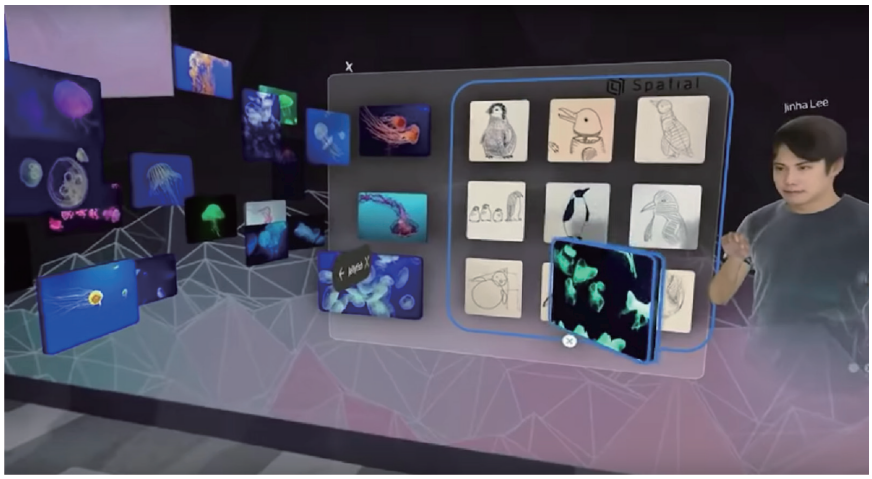
Hololens 2: Next - Generation Creative Session

Information Dynamic

Instead of presenting all the info on a plane, via Hololens 2, every information was placed in the space surrounding the user, from 2D to 3D, from static to motion via augmented reality technology.

Speech Input

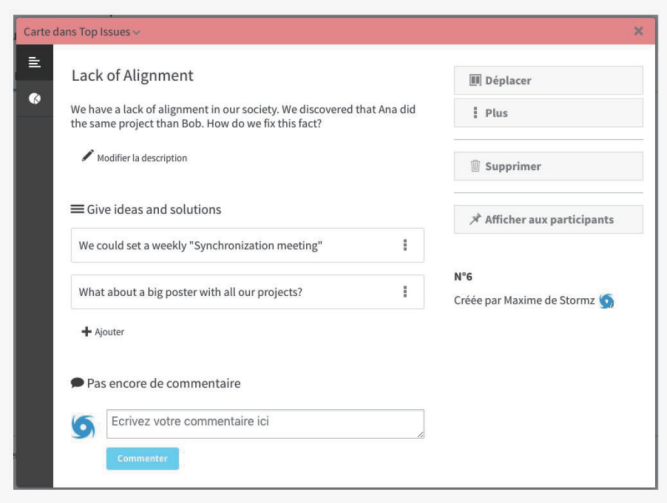
With the maturity of speech recognition, speech input is becoming one of the mainstream input methods. Compared with typing or drawing input method, speaking is more natural and leisure.



External Association

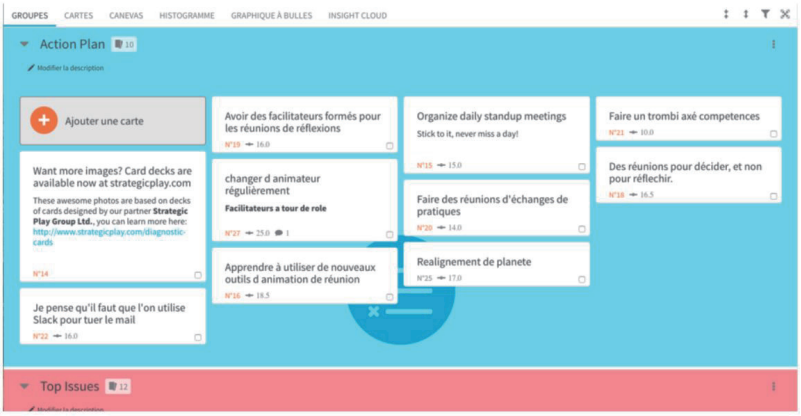
In Microsoft's future creative scenario, associations are not finished by resource group closed and stimuli are not provided by facilitators in advance. With the external help of the internet, more stimuli would be provided thus more associations would be made.

Hololens 2: Next - Generation Creative Session



Hitchhike on Other's Ideas:

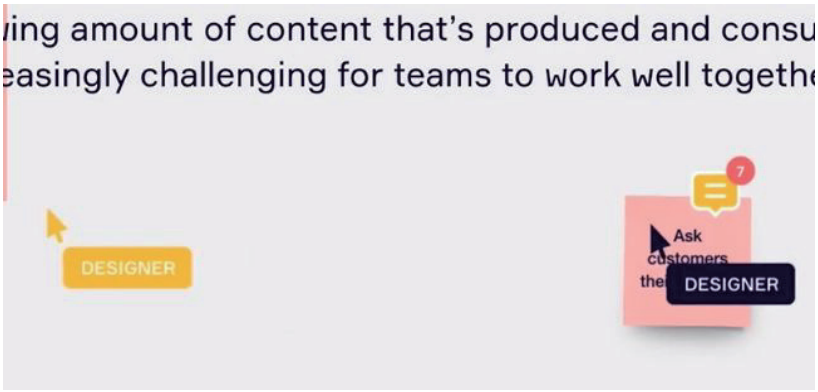
Expect for coming up with individual idea cards, in Stormz resource group can also comment on others' idea cards to turn a rough idea into a full-blown concept.



Evident Distinction between Different Groups

In this step, every idea cards would be put into clustered groups. And some visual clues like different colors or shapes can evidently differentiate different types of groups.

Miro: A Complete Online Platform for Visual Collaboration



Instant feedback from other group members

The biggest difference between offline and online collaboration is that on the online environment it's hard to sense the action of other members as immediate as possible. But in Miro, every member's cursor will be real-time displayed on the screen to greatly enhance the sense of team. In the next section, the tangible technology would be talked.

Appendix D
Feasible Tech Solutions

QR code scanning using front cameras

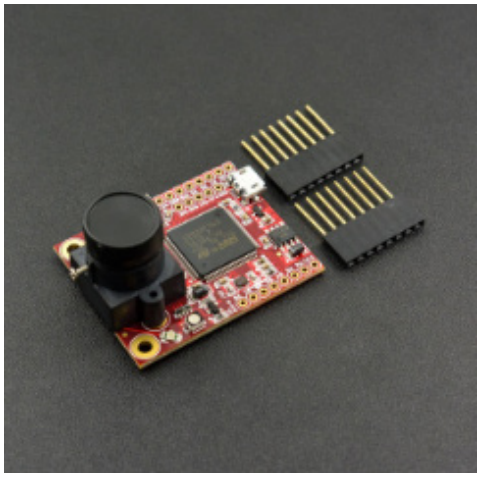
QR code scanning is a mature technology which is the first version of tangible technology to connect between physical image and digital screen. It has been widely applied in our everyday life. However, considering the action of holding cellphone to scan would influence the original interaction in creative sessions, a new way of using front camera to scan was come up with. With the new way, the cellphone can be put on the floor to scan QR code which frees the two hands of people.

I2C Color Sensor TCS34725

etecting various colors is a rather simple and also efficient way to sense the physical world. The TCS34725 sensor is the sensor that can detect different colors in the real world. But what needs to be noted that the colors aren't that much accurate and the sensing distance is really short. But they are still good enough for simple projects.

RFID / NFC Module

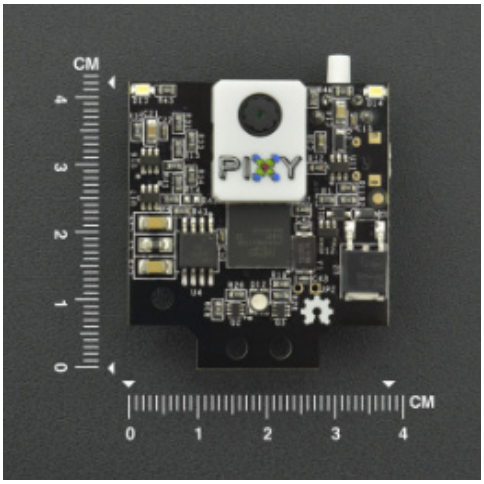
Near field communication are protocols that electronic devices use to communicate and transfer data between each other. Near field communication devices have to be very near to each other, usually between 10cm. NFC tags require no power input whatsoever. The advantage is that the NFC tag can contain almost any information but the cost is really high considering every object would one tag to be recognised.



OpenMV Cam M7

The OpenMV Cam M7 is a low-power, small, smart camera module that makes it easy to use machine vision in the real world. OpenMV can be applied to the following scenarios:

Motion detection Color tracking Tag tracking Face Detection Eye tracking Optical flow detection QR code detection/decoding Data matrix detection/decoding Bar code decoding AprilTag Tracking Graphic detection Template matching Image capture Video recording. It's perfect for the tangible technology and the only problem is the steep learning curve.



Pixy 2 CMUcam5

Comparing to OpenMV Cam M7, Pixy 2 CMUcam5 has the same functions but easier to use. It makes image recognition easier, supports multi-object recognition, and has powerful multi-color color recognition and color block tracking capabilities (up to 7 colors).

ARKit2 Image Detecting

Last year, Apple released new features for ARKit 2. One of them is Image detection. It is a really cool feature that allows users to track a 2D image in the user's environment and position an augmented reality content on top of

joy - Cons

Game controllers should be the most typical device that connect physical world and digital screen together. Compare with other solutions, it's most stable and easy to use.

Appendix E

Factors Glimpse

Introduction	Redefine Problem	Diverging	Reverging	Converging	Wrap up
Opportunity: Non-designers like clients, SME or end users are the essential part of creative sessions but they are not fully into the session now. Opportunity: For clients it's hard for them to jump out of their own profession. Insight: Team building help collaboration Emotion: Create a sense of safety by clear rules and introduction with each other	Problem: At redefine problem phase, find the right level of depth of the problem Problem: Hard to come to an agreement Problem: The input problem at redefine problem phase is not stable. Insight: Tangible way(lego) is a good method to describe the problem	Opportunity: Resource groups are still boosting and are not willing to converge. Opportunity: Postpone judgement Opportunity: Hitchhike Opportunity: Stimulate resource groups to come up with ideas instead of terms. Insight: External resources from the internet to help make associations Insight: Easy access for the resource group to add ideas on existing ones	Opportunity: Facilitators would feel losing the overview because of not participating in the process. Opportunity: Facilitators feel the heaviest workload at reverging phase. Opportunity: Use the inquiring mind Insight: Visual clues to evidently distinguish different clusters Emotion: There is a feeling of uncertainty, will something useful come out?	Opportunity: Stimulate resource groups to come up with game ideas. Opportunity: Use affirmative judgment	Opportunity: The enthusiastic vibe and motivations for new ideas suddenly disappear after the session. Problem: The final idea developed by all resource groups would hard for later game development Insight: Digital document is a suitable format for saving and future development.

Factors that applied to the whole process

Opportunity:
Except for the result, offer a good experience for the clients is also essential.
Opportunity:
Introvert and extrovert people shall be given equal chance to speak loud.
Opportunity:
New media to act as node generation and meaningful space
Opportunity:
Let resource group feel comfortable to draw ideas for communication with the help of tech
Opportunity:
Find suitable positioning for better creative session experience
Opportunity:
Design for intrinsic motivations instead of extrinsic motivations
Opportunity:
Design a system for facilitators to customize their own session flow via provided templates
Problem:
There was never a fair amount of time to really work out a concept at final phase.
Insight:
Offer clients sense of control to help them better into the session
Insight:
Positioning of hearth game can apply to creative session
Insight:
Cellphone as the new artifact of node generation and touch screen as the new artifact of meaningful space.
Insight:
More playful interactions and visual feedback can increase resource group's enthusiasm
Insight:
Apply AR technology to present information in a space
Insight:
The potential of speech input to replace post-it
Insight:
Instant team member action feedback to improve the sense of teamwork
Insight:
Digital information are presented by playful physical interactions

Appendix F
Setup of Session 1

Method

Problem Briefing & Team Building

The session starts with problem briefing. In this phase, participants are supposed to emphasize the problem and have a small talk about the process of creative sessions to help recourse group better understand the context. Also the recourse group would be asked to draw their own profile together and name the team for themselves.

Crazy Ideation Rounds

In this phase, the original problem was divided into 3 problems in different phases. At diverging phase, the question is " how to generate ideas as much as possible?" At reverging phase, the question is "How to cluster ideas?" At converging phase, the question is " How to choose ideas?" And trough a mini-game, the four resource group were divided into 2 teams as team campaign.

Also in different phases, every two teams both can have some cards for stimuli cards, which respectively encourage resource group to write down ideas, draw ideas or use body movements to express. Each round lasts 10 minutes and at the end of each round, the two teams will communicate their ideas.

Media Ideation

After the crazy ideation rounds, many ideas were generated. And in this phase, the ideation would step into a more practical phase. Every participant would get a random media(cellphone, big touch screen, lego and post-it & flip paper to come up with ideas to imagine what the creative session would be like in the future with this media. Every 5 minutes, the resource group would write down ideas based on their own media. When finished, the resource group would transform their own media to the next one to think new ideas based on the new media. After four rounds, this phase ended.

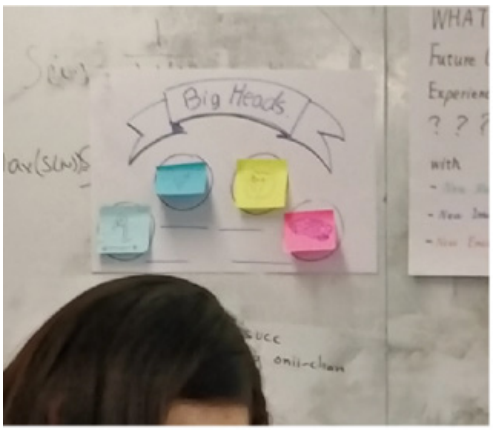
Elaborate Ideas

In the final stage, every participant would have all ideas from the whole resource group about their own chosen media. Then in 10 minutes, they would look through all the ideas and chose some of them to make up with a complete story. In the end, everyone presented their final concepts to others.

Result

Here are the photos taken in different phases.

Problem Briefing & Team Building

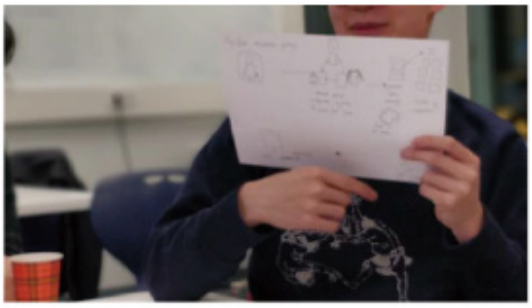


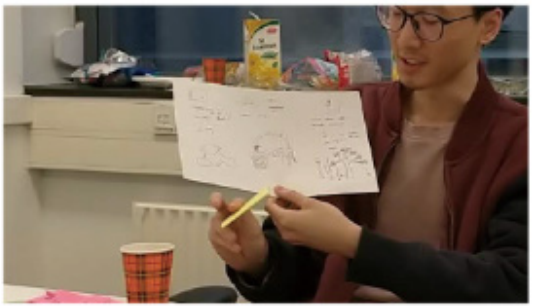
Crazy Ideation Rounds

Figure XX: Game for team pairing

Media Ideation

Elaborate Ideas





Appendix G
Method Used in Session 2

Method

First of all, the LEGO serious play would be used to help resource group build the personas for the clients. The resource group would choose a character respectively as the user profile. Then they would use different mini-blocks to build on the persona based on their strength, weakness, value, and goal. After that, every resource group would present their personas based on the four criteria.

In the next phase, these personas would be the teammates within the game designers. And two rounds of ideation would be hosted. In the first round, the resource group would be asked to come up with as many interesting mechanics they have played or designed in cooperative games.

In the second round, based on mechanic elements already collected, the resource group begin to think of more concrete ideas about how to put these elements into diverging, reverging and converging phase respectively.

Appendix H
Detailed Storyline

	Redefine Problem	Diverging	Reverging	Converging	End Result
Session Goal	Formulate a HOW TO question	Come up with sufficient ideas in this phase	Have enough clusters and ideas on each cluster	Vote for the best ideas and combine ideas together	
Plant a tree together	Find a good place to deposit the seed	The tree is tall enough to get through the shadow	Have enough branches and leaves to defend strong wind. Have enough branches and leaves to leave a shadow for animals.	-Bloom flowers to attract bees for yielding fruit.	The selected ideas yield fruits
Work together to fight ghost	Understand the danger -Cause & why Describe a strategy -How can you...	Come up with different tools to defend the ghost	Determine which tools can best be used to get the job done.	Improve the chosen tools to formulate a game	Use the improved tools to fight ghosts.
Planet Exploration	Assemble for preparing to launch	Fly to a specific planet	Explore new areas on the planet	Choose the best places to live	

Appendix I
Choice of Interaction

The first interaction is technically based on the controller on the table. The operation area and digital screen are divided.

Strength:

Easy to accomplish and the screen can be more dynamic

Weakness:

The operation area and the display area is divided so the focus of the participants would frequently change during the session. The way of input is sort of limited.

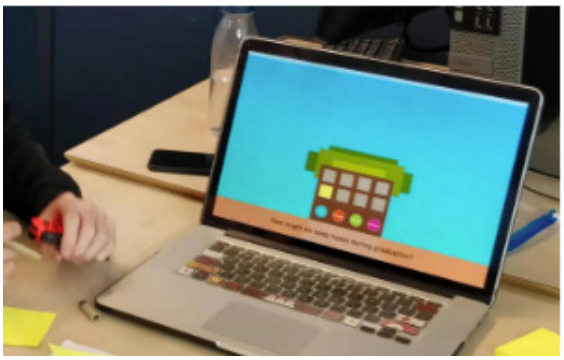
The second interaction is technically based on touchable projector. The operation area and digital screen are the same.

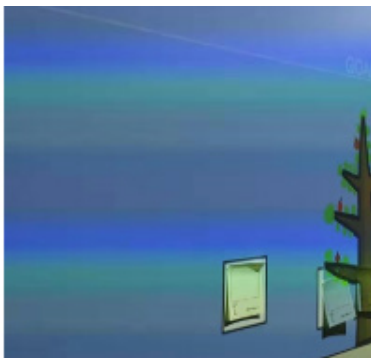
Strength:

The visual area and the operation area are in the same spot so the participants wouldn't easily be distracted.

Weakness:

Because the physical post-it is directly pasted on the wall, the screen content dynamics is hard to be accomplished. And the cost is expensive.



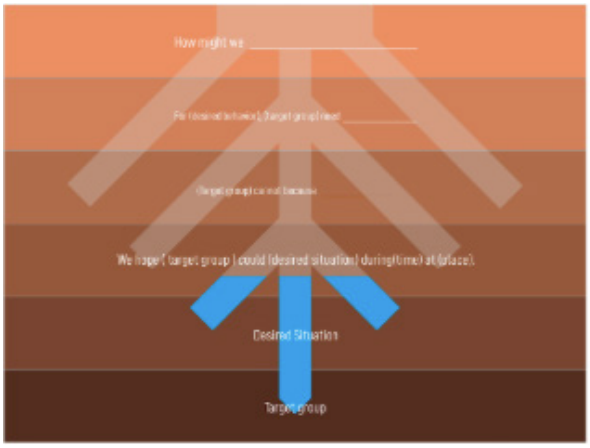


Appendix J
Complete Iteration Process

The 1st Playloop

Problem Statement

Playtest a mini game that asks questions in a linear order based on 5w1h technique.



Brief Introduction

Based From the result of Chapter Exploratory Research, one of the main problems in the redefine problem stage is that the process is too dependent on the control of facilitators and easily goes to disorder.

In the first design, the visual contents on the screen are based on 5w1h technique and shown to the players one by one in order. And at the end players need to redefine the original problem.

Combined with the story of deep diving into the earth, the game is about water moving upwards from deep layer to the earth along the tree root.

Feedback from Players

What worked Players felt positive about the instructions of answer questions one by one and 5w1h technique itself can help summary the current problem.

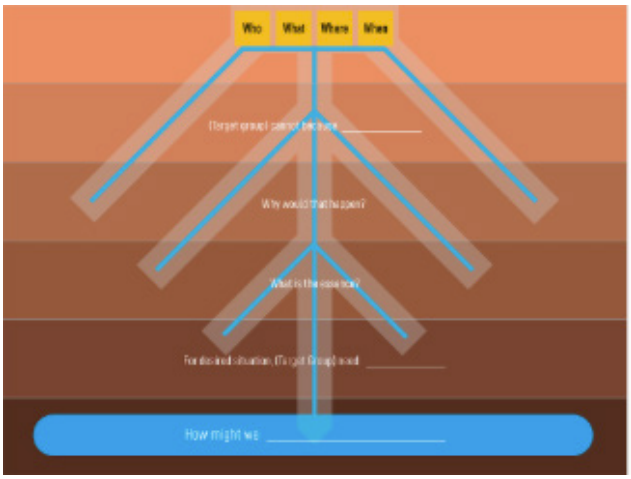
What not The visual of moving upwards from deep layer to the earth along the tree root convey the info for players that they were searching for the real problem in depth. But current 5w1h technique didn't make it work

What not At the end of redefining problem, it was hard to reach an agreement for the resource group.

The 2rd Playloop

Problem Statement

Playtest a mini game that combines 5w1h and 5why techniques for redefining the problem.



Brief Introduction

Based on the feedback from the first design, the 5w1h and 5why techniques are combined together for this stage. 5w1h helps the resource group better understand the current problem and the 5why technique help the resource group get the right depth of the problem.

Feedback from Players

What worked Asking more why helped players think more about the real problem and the final how problem helped add details to the redefined problems

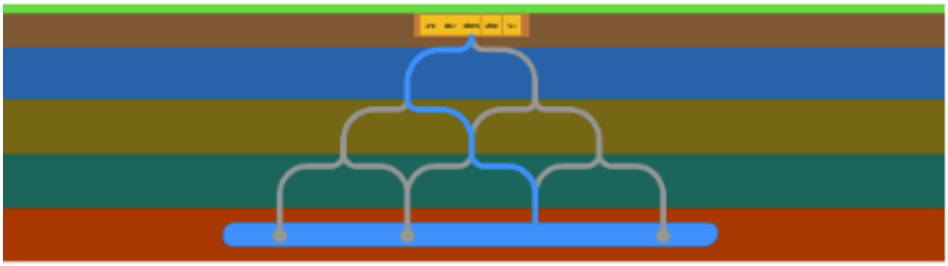
What not The process still wasn't like a game which was short of interactions. The players most of the time followed facilitator's instructions.

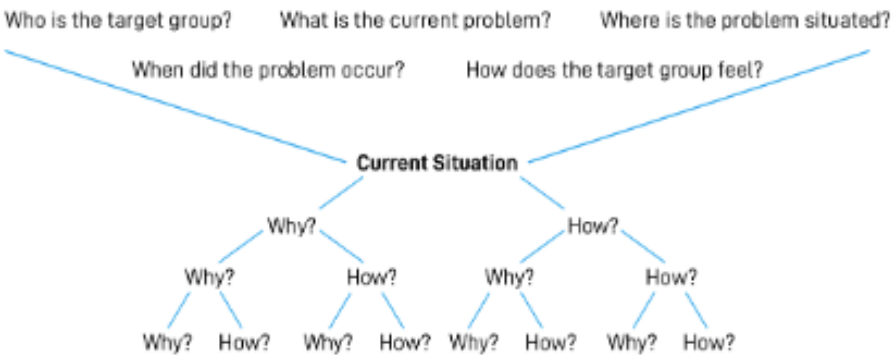
What not At the end the players found it hard to make a decision and they picked a random problem as redefined one.

The 3rd Playloop

Problem Statement

Develope the second design based on a more interactive technique- ladder of abstraction.





Brief Introduction

Ihe second design already fulfills the session goal that redefine a question in a clear and simple way. However, it still can be improved in several aspects. First of all, 5 why technique can help find the latent knowledge of the problem. But not every problem is suitable for this technique. For the problem which is already abstract and latent, it needs to be asked how to be more specific. Therefore a technique was introduced - ladder of abstraction.

The ladder of abstraction is a technique to help exploring the problem on different levels of abstraction. By asking "why?" the problem statement will become more abstract, broad and general. By asking "How", it will become more concrete, narrow and specific. The aim is to reframe the problem to get to the essence of the problem that should be resolved and open up the potential solution space.

In the third design, for every problem statement, the players could decide together to ask why to be more abstract or ask how to be more concrete. After 3 rounds, the players get a new problem statement.

Feedback from Players

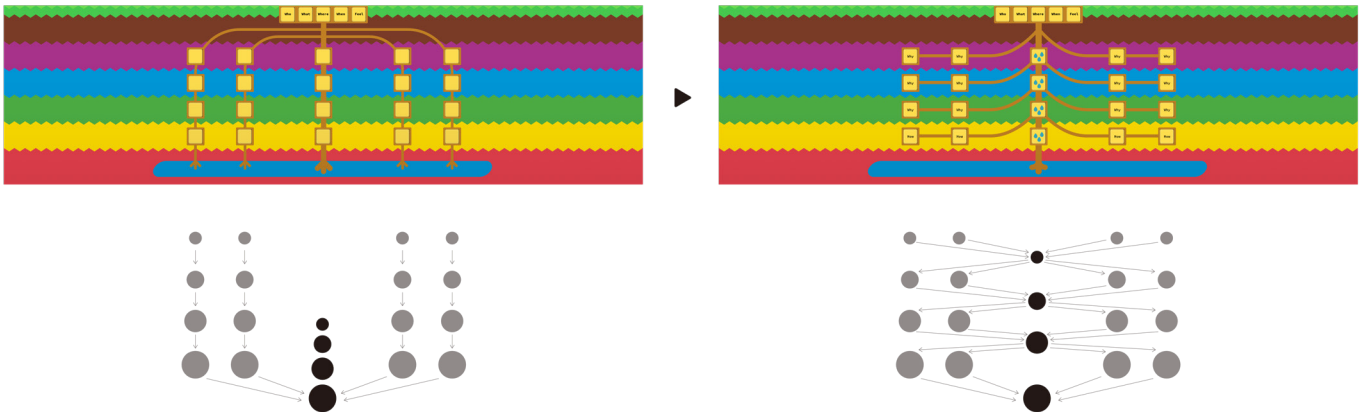
What worked The players were more into the session because of the chance to make a choice.

What not The quality of redefined problem statements from players are diverse.

The 4th Playloop

Problem Statement

Develop the second mini game based on an improved 5why techniques for multiplayers



Brief Introduction

In this playloop, a comparative play was conducted and the most focus was put on improving 5 WHY method for multiplayers. In the orginal 5 WHY method, the individual player was asked to keep thinking why for several rounds to find the essence of the initial problem. It worked for individual players but not for multiplayers. As seen in the left side of figure 39, players were asked to keep thinking why individually. Every player was on its own track for several rounds and at the end, it was hard to get an agreement between players. When encounting this situation, another 5 WHY method was proposed. As seen in the right side of figure 39, in every round the players were asked to think why first then discussed to get an agreement. Based on the agreement, players were aksed to think a new round why.

Feedback from Players

What worked Discussion after each round made it easier to get an agreement between players

What not Choose one opinion from four opinions to get an agrement made it like a competition between players. It made some players feel stressful.

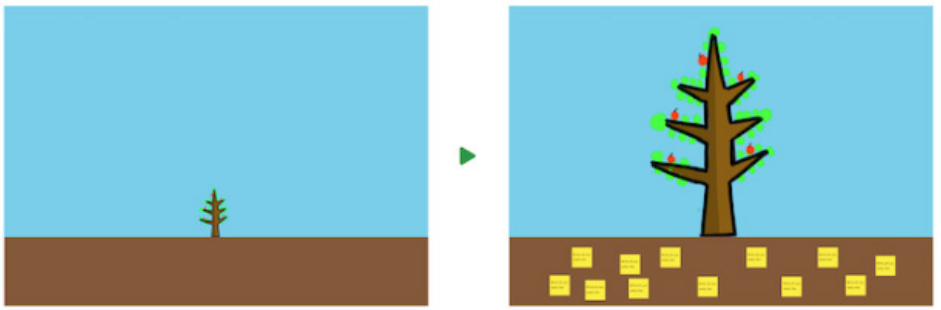
Summary for Redefien Problem Stage Iteration

Compared with designs in different playloops, they both have their own strength and weakness. The design in third and forth playloop performed best. Considering that the deisgn is faced up to multiplayers, the improved 5WHY method in forth playloop is more suitable for this context. In conclusion, the final design would be based on the improved 5WHY technique and aspire to increase the degree of interaction for players.

The 1st Playloop

Problem Statement

Playtest if the players can easily understand the relationship between growing up the tree and coming up with ideas.



Start as a sprout.

The writen ideas work as nutirents to make the tree grow.

Brief Introduction

Based on the minimum viable product (MVP) principle, the first design shall be simple enough to test if players would accept the story of cultivating a tree together during the creative session.

In the design, the post-it functions as nutrients to grow up the tree.

Feedback from Players

What worked The story of growing up trees worked and all players understood it immediately

What not The strength of motivation was limited and more design elements shall be applied to the game.

What not The visual change from a sprout to a tree is not evident.

The 2nd Playloop

Problem Statement

Playtest the game that includes different creativity technique blocks.

Brief Introduction

In this design, the overall goal of growing up the tree is divided into several little challenges to improve motivation and more creative technique blocks were introduced into the game including thinking reverse, super power, random stimuli etc.

Feedback from Players

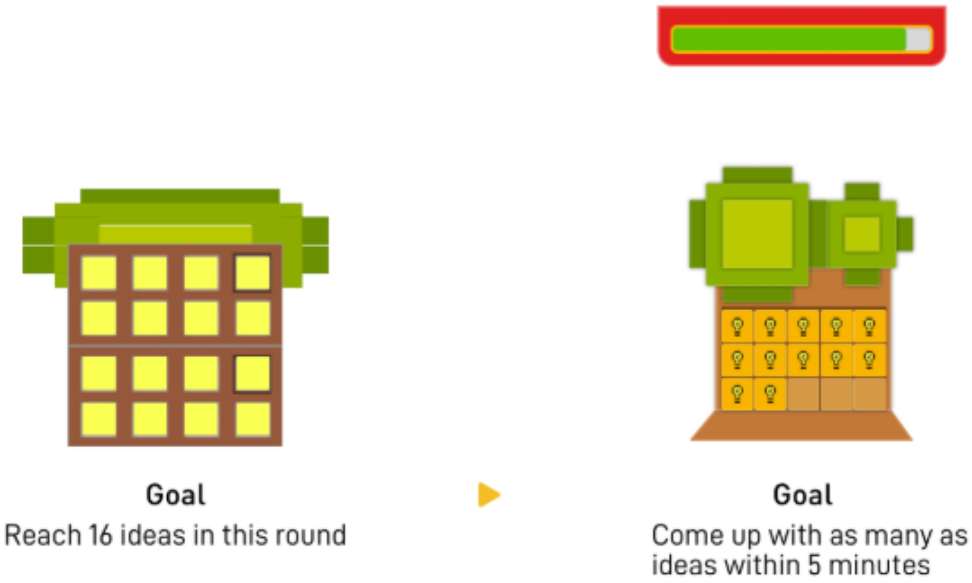
What worked The several little challenges gave the players continuous sensen of progression

What not Some mechanics were not reasonable. For the goal of each creative technique block, reaching a certain amount of ideas was not practical. And the goal that coming up with as many as ideas in a limited time was recommended.

The 3rd Playloop

Problem Statement

Playtest the mechanism that the reaching goal of each round is time limited.



Brief Introduction

Based on the feedback from the second design playtest, the original goal of reaching certain amounts of ideas in a round was not practical because for some players they still have the urge to come up with more ideas after reaching the goal. Therefore the goal was adjusted that players could ideate as much as they can within a certain time.

Feedback from Players

What worked The new time goal for each round worked.

What not At the end of each round, the players could be asked to fill in 2 more ideas as the ending.

What not The final goal of getting the tree to a certain height is clear but not motivating enough.

The 4th Playloop

Problem Statement

Design the characters that help players jump into the story of the game.

Brief Introduction

From the result of exploratory research, acting as new character could help players get away from their life and jump into the magic circle of the game. Also the adding of animal characters can make the whole tree growing games more vivid. Therefore the part of character selecting process was made .

Feedback from Players

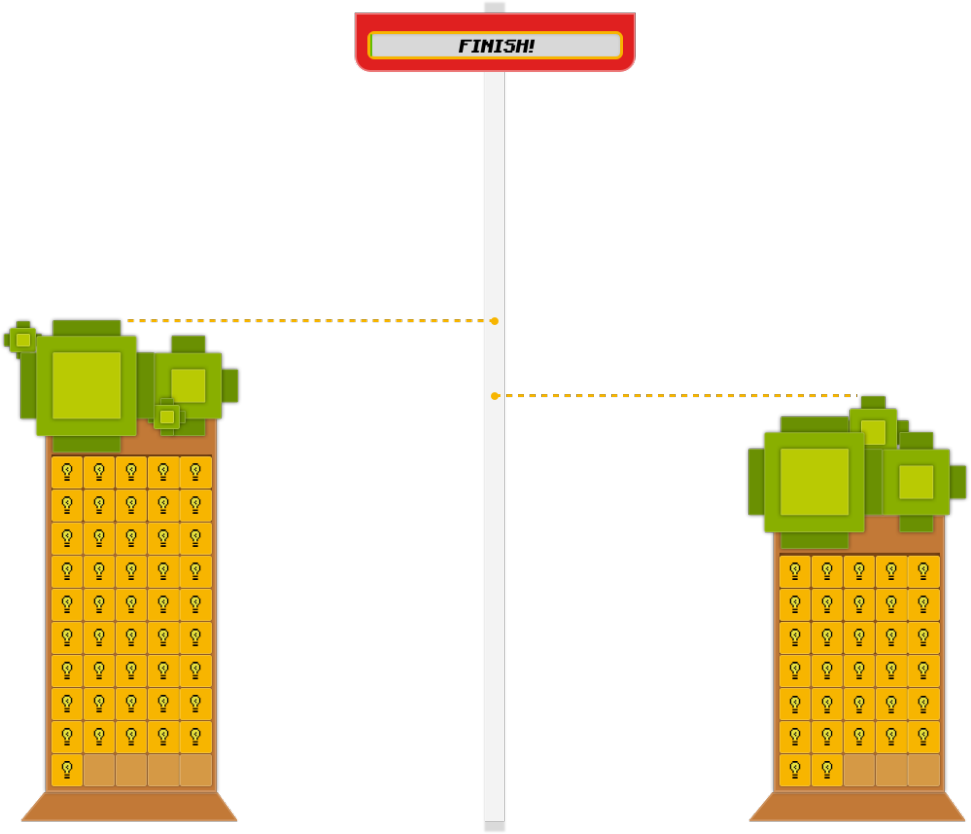
What worked The players liked it and thought it cute

What not Now the current concept was really like a game but not everyone liked games. Therefore this concept had some risks to the player who didn't have a game experience before.

The 5th Playloop

Problem Statement

Playtest the mechanism that divides players to two teams competing the height of growing trees.



Brief Introduction

From the feedback of the 3rd playloop, the game goal of reaching a certain height for the tree together is clear but not motivating enough for the players. In order to give more meaning to the height of the tree, the mechanic of team competition was introduced. 4 players would be split into 2 teams to compete the height of trees they build.

Feedback from Players

What worked The players cared more about the result of the game.

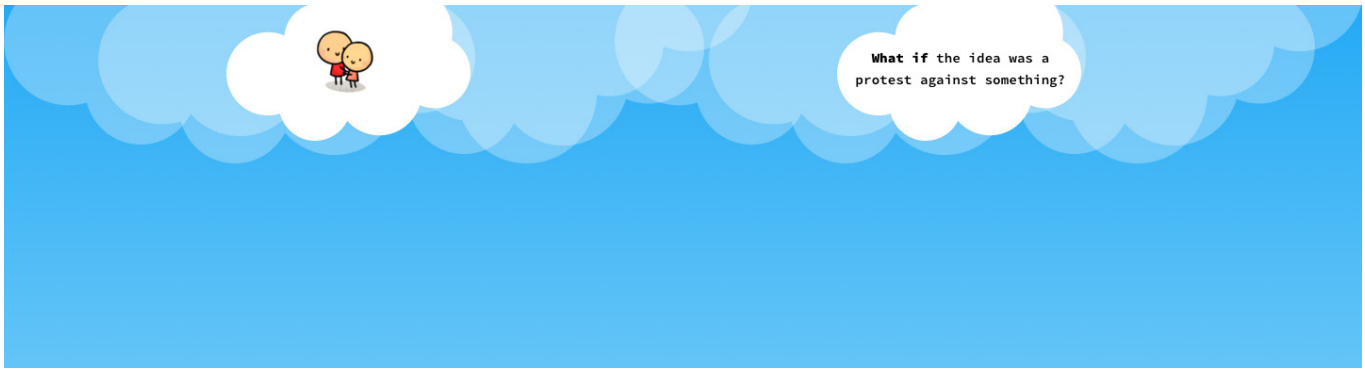
What worked The discussion within the team helped improve the quality of ideas to some extent

What not With the mechanism of competition, the players focused more on the quantity of ideas and ignore the quality of ideas.

The 6th Playloop

Problem Statement

Choose the best stimuli type for particpants with diverse backgrounds



Brief Introduction

There are different kinds of stimuli for the players such as random images, random words or trigger words. And different stimuli are suitable for different target group. In the grauate student's assumption, for the players without design backgrounds, when facing up with an open-ended problem statement, they don't know where to start and the ideas they come up with for the problem is always general. Considering that a trigger with the question " what if " could offer some promising directions for players to come up with more solid better ideas. Therefore a comparative playtest between random images and random trigger words was conducted.

Feedback from Players

What worked Trigger words worked better on narrowing problem scope and helped player come up with better ideas

What not Trigger words made players think in one certain direction

Summary for Diverging Stage Iteration

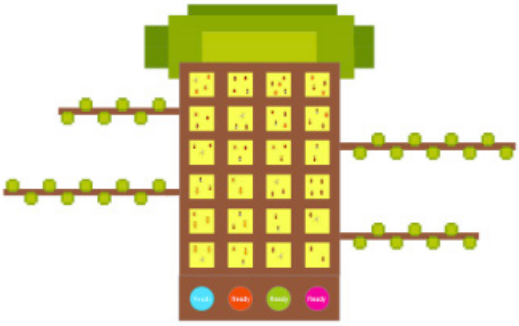
After six loops of playtest, the main elements for the final design are assured like time slot, character selecting ,team competition and trigger words. What needs to mention is that the creative technique blocks in the diverging phase. It shall be modular and be selected according to facilitator's requirement.

The 1st Playloop

Problem Statement

Playtest if the players can easily understand the relationship between branching out and clustering

Paper Prototype



Digital Prototype

Brief Introduction

To test the relationship between clustering ideas and branching out, a paper prototype was made and play tested. Then in order to use more dynamic interactions to help players better understand the relationship, a digital prototype was also made.

Feedback from Players

What worked The relationship was easy to understand and the players could see clearly see the overview of the distribution of ideas on each cluster.

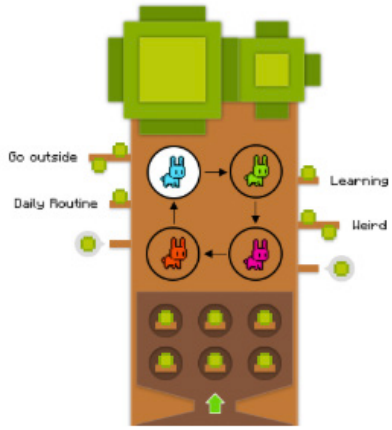
What not The current game didn't give enough motivation to the players for clustering

What not The mechanic didn't help the clustering process.

The 2nd Playloop

Problem Statement

Playtest the mechanics that every player has the chance to be the leader and make the decision for clustering.



Brief Introduction

In the second design, the mechanic is based on the card game. Every player draws 6 ideas in turns. And in one of the player's turn, he or she would be the leader and discuss with the rest of the team to put ideas into the branch area.

Feedback from Players

What worked The mechanics worked great and every player had the chance to speak out.

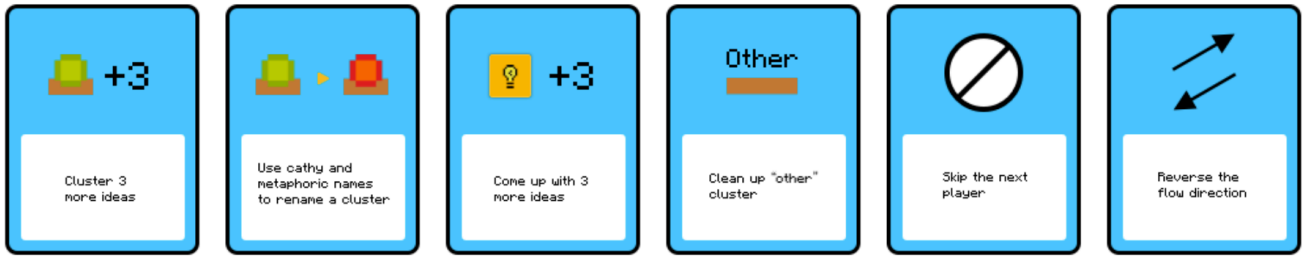
What not The players felt the mechanics can be accomplished without the TV screen and it was not essential.

What not The mechanics is linear and the players would feel bored after several rounds

The 3rd Playloop

Problem Statement

Playtest the added mechanics that make the process of the reverging stage more fun and dynamic.



Brief Introduction

In the third design, the random mechanic was introduced. Every time the player finished his or her turn, he or she would have a chance to draw a function card. The contents on the card are diverse to help increase the dynamics of the game. And the playtest was to test if the mechanism could help the clustering process or make it more chaotic.

Feedback from Players

What worked The process of the reverging phase became more interactive and players got more involved in

What not The content of the function still had spaces to adjust.

Summary for Reverging Stage Iteration

After three loops of playtest, the final design would focus on the mechanics of drawing ideas post-it and function cards in turns.And more story would add to the reverging stage to better connect with other stages.

The 1st Playloop

Problem Statement

Comparative playtest between the creative technique dot voting and C-box within the story in the converging stage.

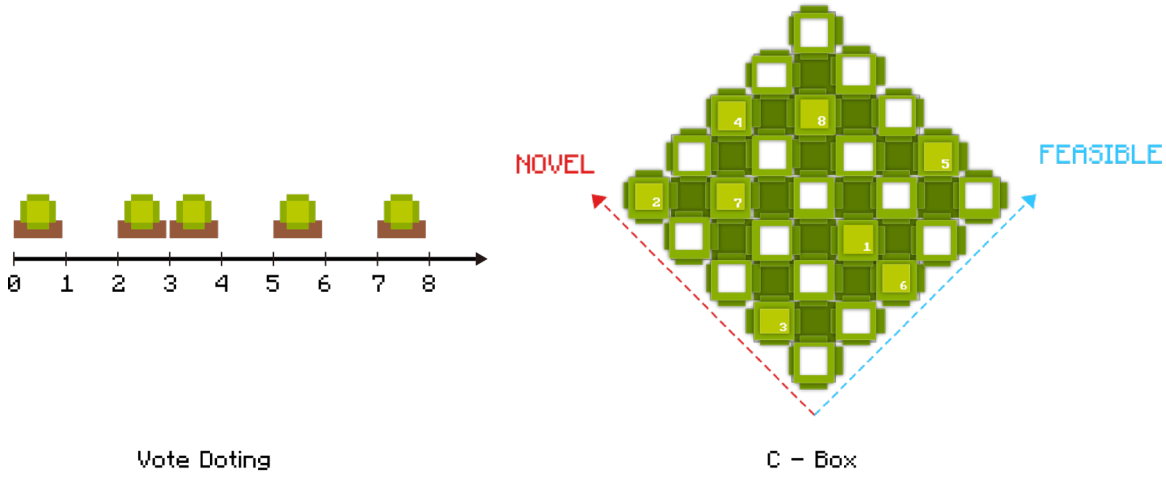


Figure 50. Comparison between Dot Voting and C - Box Techniques

Brief Introduction

In this playtest, more focus were put on the comparison between vote doting and c-box creative techniques. Both of them were common techniques applied in converging stage and players tried both the digital prototypes to see which one was more suitable for the current design. There is a main criteria for judgement: outcome of this operation shall seamlessly connect to the next iteration step.

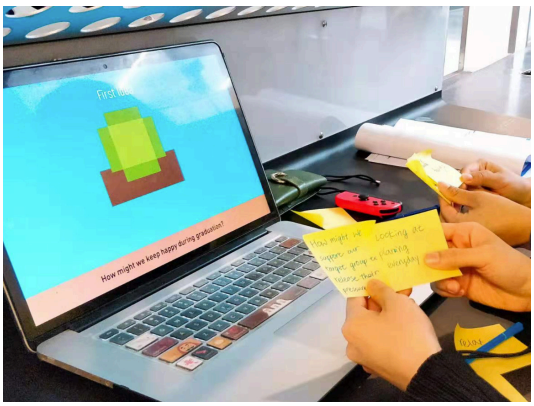


Figure 51. During the Dot-Voting Process

Feedback from Players

What worked Dot-Voting is easy to operate, but the evaluation criteria is single which the chosen ideas are hard to directly iterate.

What worked For C-box, the operation is more complicated but with the two criteria, the chosen ideas are better suitable for iteration

What not Considering clients have their own criteria to choose ideas, both dot - voting and c- box cannot make it work.

The 2nd Playloop

Problem Statement

Playtest the game that helps iterate the chosen ideas

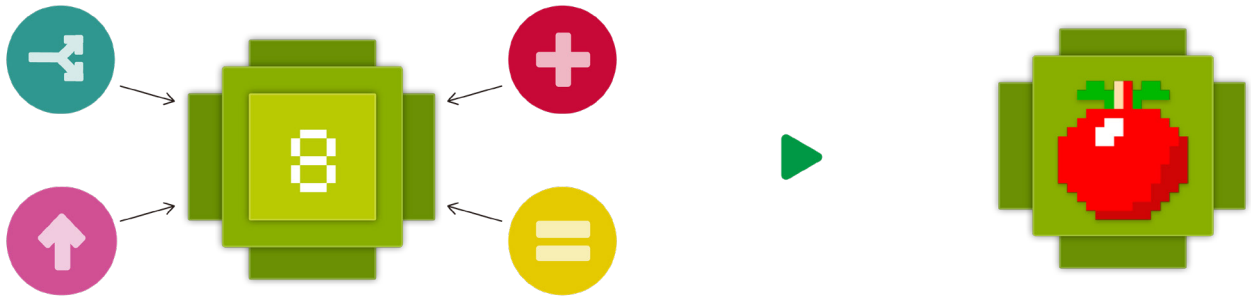


Figure 52. The process of iterating ideas

Brief Introduction

In this design, the story narritive is to use different creative methods involving combine, adapt, magnify and another use as nutrients to make the chosen ideas flourish to a unique fruit. And the playtest was conducted to see if players could make a connection between iterating the idea and flourishing.

Feedback from Players

What worked The game based on SCAMPER creative technique could help iterate chosens to be suitable with clients' requirements.

What not Players didn't have the urge to press the button to interact with the screen during the process.

Summary for Converging Stage Iteration

Based on the result of playtest, in the evaluation step c-box would be chosen as the main creative method but the two criteria have the potential to be adjusted. In the iteration step, the SCAMPER technique would continue to be applied but the progression feedback shall be provided during the process.

Appendix K
Material for Evaluation Test

Quantitative Evaluation (Questionnaire)

Name:

Before test

How valuable do you think could gamifacation bring to the creative session?

No value at all ◯ ◯ ◯ ◯ ◯ Very Valuable

Introduction

To which extent could you understand the introduction story?

No at all ◯ ◯ ◯ ◯ ◯ To a great extent

How far do you think the story jump out of your ordinary life identity?

No at all ◯ ◯ ◯ ◯ ◯ Very far away

To which extent do you think the story help you build connections with others?

No at all ◯ ◯ ◯ ◯ ◯ To a great extent

Redefine Process

To which extent do you like the whole expereince?

No at all ◯ ◯ ◯ ◯ ◯ To a great extent

To which extent do you have the eager to think deep during the challenge?

No at all ◯ ◯ ◯ ◯ ◯ To a great extent

To which extent do you feel you make your own decisions during the challenge?

No at all ◯ ◯ ◯ ◯ ◯ To a great extent

Diverging

To which extent do you feel stressed?

No at all ◯ ◯ ◯ ◯ ◯ To a great extent

To which extent do you feel collaborative with your team member?

No at all ◯ ◯ ◯ ◯ ◯ To a great extent

To which extent do you feel inspired by stimuli clouds?

No at all ◯ ◯ ◯ ◯ ◯ To a great extent

Reverging

To which extent do you feel organized in this process?

No at all ◯ ◯ ◯ ◯ ◯ To a great extent

To which extent do you have the sense of ownership?

No at all ◯ ◯ ◯ ◯ ◯ To a great extent

Converging

To which extent do you feel clear about the overview of evaluation?

No at all ◯ ◯ ◯ ◯ ◯ To a great extent

To which extent do you feel the urge to keep iterating?

No at all ◯ ◯ ◯ ◯ ◯ To a great extent

Ending

To which extent do you feel fun?

No at all ◯ ◯ ◯ ◯ ◯ To a great extent

To which extent do you have the sense of accomplishment?

No at all ◯ ◯ ◯ ◯ ◯ To a great extent

To which extent do you feel unique of the result?

No at all ◯ ◯ ◯ ◯ ◯ To a great extent

Qualitative Evaluation (Interview , Observation)

Before test

What do you think of gamification?

What is creative session in your mind?

How do you feel putting game experience into the creative session?

Introduction

What do you think of the introduction story?

How do you feel when selecting the character(jump out of their identity)?

Redefine Problem

Can you follow the instruction in this challenge?

Have you encounter difficulties when selecting WHY insight with others?

Is there anything that confuses you in this process?

Diverging

How do you feel about win or lose in this part?

Do the blocks help you come up with more interesting ideas?

Do you feel the time pressure in this phase?

Reverging

How do you feel about the way of taking the lead in turns?

What do you think of the content of function cards?

How do you feel about the whole interaction experience?

Converging

How do you feel about the interaction experience?

What do you think of the voting system?

Do you like the concept of iterating fruits' conditions?

Ending

What do you think of the end result?