



### **Hak cipta dan penggunaan kembali:**

Lisensi ini mengizinkan setiap orang untuk mengubah, memperbaiki, dan membuat ciptaan turunan bukan untuk kepentingan komersial, selama anda mencantumkan nama penulis dan melisensikan ciptaan turunan dengan syarat yang serupa dengan ciptaan asli.

### **Copyright and reuse:**

This license lets you remix, tweak, and build upon work non-commercially, as long as you credit the origin creator and license it on your new creations under the identical terms.

## **CHAPTER II**

### **LITERATURE STUDIES**

#### **2.1. Interactivity**

Interactivity is the reciprocal process of communication between user and media that involves control of the user, so that the way the user acts affects how the information is conveyed towards the user, vice-versa. The exchange of information can also be divided into three levels of interactivity. (Williams, Rice, and Rogers, 1996) The highest level of interactivity allows information exchange to be done face-to-face and in *real time*. At lower level, the exchange of information is done through intermediaries or mediums. Then the lowest interaction does not allow intervention in the presentation of content. (Valley, 2016).

##### **2.1.1. Interactivity Levels**

According to Valley (2016), interactivity adds involvement. There are four levels of interactivity, namely: passive, limited, moderate, and simulation. These levels are based on games and multimedia design which can help overall product development.

1. Passive: users use linear flow, the results are already determined, to facilitate the use of a function. Examples are navigation, animation, true or false questions, and multiple choice questions.
2. Restricted: involves a degree of passive interactivity, plus a number of additional functions in the form of user controls that add to their interaction

3. experience. Examples are clickable images, basic activities such as drag and drop on digital media.
4. Moderate: including from the previous two levels, moderate level gives users more involvement and developers to change the experience that users feel more. Examples are video game animation based on scenarios, and flash-based animations.
5. Simulation: The last level which is the most immersive of all levels of interactivity, simulation combines the previous aspects. This level is usually done by means of gamification, 3D simulation, with various multimedia varieties.

## **2.2. Serious Games**

Serious games are types of games that are designed for purposes more than just entertainment, such as for the purposes of education, health, science and technology, civil engineering, and politics. The ideas and concepts of serious games are more or less the same as the simulation aspect as the last level of interactivity, but are more emphasized on strengthening the elements of challenge and entertainment. (Suttie, 2012).

### **2.2.1. Serious Games Mechanics**

According to Suttie (2012), serious games' user-centric game mechanics can be linked to pedagogical aspect in games, such as genres, design patterns, and game mechanics by researchers. Serious games has aspects can provide pedagogical constructs which represented in game mechanics that defines the learning

mechanism which replicates pedagogically effective serious game mechanics as follows:

GAME MECHANICS	THINKING SKILLS	LEARNING MECHANICS	LOTS to HOTS
<ul style="list-style-type: none"> <li>○ Design/Editing</li> <li>○ Infinite Game play</li> <li>○ Ownership</li> <li>○ Protégé Effect</li> <li>○ Status</li> <li>○ Strategy/Planning</li> <li>○ Tiles/Grids</li> </ul>	<b>CREATING</b>	<ul style="list-style-type: none"> <li>○ Accountability</li> <li>○ Ownership</li> <li>○ Planning</li> <li>○ Responsibility</li> </ul>	
<ul style="list-style-type: none"> <li>○ Action Points</li> <li>○ Assessment</li> <li>○ Collaboration</li> <li>○ Communal Discovery</li> <li>○ Resource Management</li> <li>○ Game Turns</li> <li>○ Pareto Optimal</li> <li>○ Rewards/Penalties</li> <li>○ Urgent Optimism</li> </ul>	<b>EVALUATING</b>	<ul style="list-style-type: none"> <li>○ Assessment</li> <li>○ Collaboration</li> <li>○ Hypothesis</li> <li>○ Incentive</li> <li>○ Motivation</li> <li>○ Reflect/Discuss</li> </ul>	
<ul style="list-style-type: none"> <li>○ Feedback</li> <li>○ Meta-game</li> <li>○ Realism</li> </ul>	<b>ANALYSING</b>	<ul style="list-style-type: none"> <li>○ Analyse</li> <li>○ Experimentation</li> <li>○ Feedback</li> <li>○ Identify</li> <li>○ Observation</li> <li>○ Shadowing</li> </ul>	
<ul style="list-style-type: none"> <li>○ Capture/Elimination</li> <li>○ Competition</li> <li>○ Cooperation</li> <li>○ Movement</li> <li>○ Progression</li> <li>○ Selecting/Collecting</li> <li>○ Simulate/Response</li> <li>○ Time Pressure</li> </ul>	<b>APPLYING</b>	<ul style="list-style-type: none"> <li>○ Action/Task</li> <li>○ Competition</li> <li>○ Cooperation</li> <li>○ Demonstration</li> <li>○ Imitation</li> <li>○ Simulation</li> </ul>	
<ul style="list-style-type: none"> <li>○ Appointment</li> <li>○ Cascading Information</li> <li>○ Questions And Answers</li> <li>○ Role-play</li> <li>○ Tutorial</li> </ul>	<b>UNDERSTANDING</b>	<ul style="list-style-type: none"> <li>○ Objectify</li> <li>○ Participation</li> <li>○ Question And Answers</li> <li>○ Tutorial</li> </ul>	
<ul style="list-style-type: none"> <li>○ Cut scenes/Story</li> <li>○ Tokens</li> <li>○ Virality</li> <li>○ Behavioural Momentum</li> <li>○ Pavlovian Interactions</li> <li>○ Goods/Information</li> </ul>	<b>RETENTION</b>	<ul style="list-style-type: none"> <li>○ Discover</li> <li>○ Explore</li> <li>○ Generalisation</li> <li>○ Guidance</li> <li>○ Instruction</li> <li>○ Repetition</li> </ul>	

Figure 2.1 Serious Game Mechanics According To Thinking Skills.  
(Suttie, 2012)

### 2.2.2. Fun Theory

Fun, etymologically, comes from the middle English word “fonne” which means “fool”, or “fonn” which means “pleasure” in Gaelic. Fun is described as a source of enjoyment.

Humans are programmed to enjoy learning patterns, which are seen in games. This enjoyment incites fun, which arises from learning and mastering. The enjoyment is a product a set of chemicals called ‘endorphins’, which happens from learning and mastering something. Thus, our bodies reward us with moments of pleasure, which arises comprehension. (Koster, 2004).

### 2.3. Tabletop Game

Tabletop in Oxford is defined as the surface of a table. By adding the word game, it can be interpreted as a game that is played on the surface of a table. Tabletop games can be divided into several categories based on the physical form of the game:

- a. Boardgame: a game played on a board with various complementary elements or assets such as pawns, dice, or cards. Example: chess, monopoly, ludo.
- b. Card game: a game that uses card media. Card games use representation elements of the content depicted in cards to support gameplay in the game.

An example of a card game is playing cards.

#### 2.3.1 Card Game Elements

According to Whiter (2011), in the book *The Ultimate Book of Games*, there are various terminologies in card games:

1. Rank: a representation of the level of values on a card.

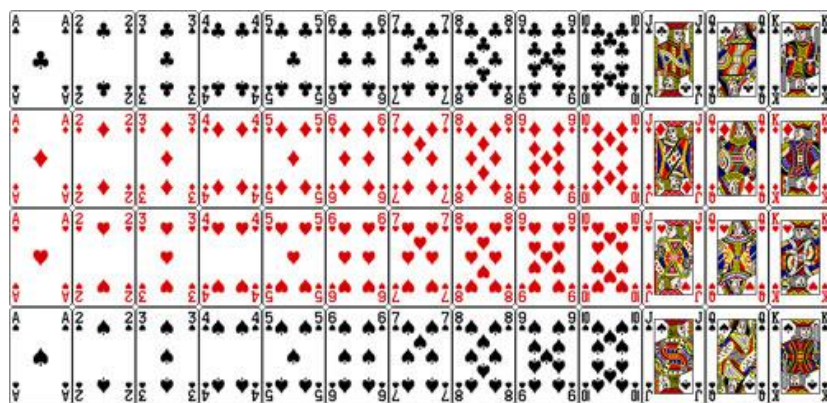


Figure 2.2 Rank In The Poker Card Game

(source:<https://www.emanueleferonato.com/images/cardz.jpg>)

2. Suits: the categories that classify cards. For example diamonds, curls, hearts, spades.
3. Trump Card: the card that has the highest level of all cards in the game.
4. Wild Card: is a card that is able to represent any card chosen by the user.
5. Trick: cards that have effects and strategies that are able to change the flow of the game.



Figure 2.3 Wild Card And Trick Card In Uno  
 (source: <https://www.unorules.com/>)

6. Discard: the act of discarding or replacing cards in a game.
7. Tableau: take a card from the deck.

#### 2.4. Gameplay

*Gameplay* is a way to play or mechanism in a game that connects players with the goals of a game. Gameplay is different from play, where players are required to have a goal, and also immersed in the flow of the game. For example, in the video game GTA (Grand Theft Auto), when the player is in freeroam mode, where the player can explore the area freely, this situation cannot be said to be a gameplay,

but only play, because the player is not immersed in the game and has no goals. However, when the player gets a mission, chased by the police, blocked by a roadblock, then this situation can be called gameplay, because the player is immersed in the game because he has a goal. The experience of 'immersion in the game is referred to as flow, and is an important aspect in designing the gameplay of a game, (Walther, 2003)

#### **2.4.1. Types of Gameplay in Tabletop Games**

Kritz (2017), divides the type of gameplay in tabletop games based on their goals into seven, namely :

1. Pick-up and delivery: players take an item or source at a certain location in the game area and deliver it to another area.
2. Pattern recognition: game components are arranged in the game area to form certain patterns, and players must identify these patterns to achieve certain objectives.
3. Memory: players must remember events or information at certain times to reach certain objectives.
4. Player elimination: a mechanism that eliminates players in a game that contains more than 2 people. Players are eliminated and the game will continue without these players. Example: in a monopoly the player will be eliminated if he is bankrupt.
5. Area control: players fight over control or resources in a certain area and typically give rewards and rewards to the player who has control or has the most unit a certain area.

6. Resource Management: players manage a number of resources as they compete to collect and spend these resources to obtain profits.
7. Area Enclosure: the player moves and places the pieces as far and wide as possible to reach certain objectives.

#### **2.4.2. Types of Mechanics in Tabletop Games**

Kritz (2017), divides the type of mechanics in tabletop games based on their goals into 19, namely :

1. Gamble: players need to gamble in the game by making a choice which outcome depends on other player's choices or a random thing.
2. Expression: require players to express themselves in specific ways to play the game, such as role-playing, singing, or storytelling. The objectives is expressing information to fulfill a requirement to progress in the game.
3. Trading: players can exchange resources with each other.
4. Random Draw: using some random mechanism to generate a random object or value, such as number of movement in snake and ladders.
5. Action Programming: this mechanic, every player must secretly choose their next number of actions, and then each player execute their actions according to the choices made.
6. Collection: A game where players need to collect something, a component, points, resources etc as a set or as a pool.
7. Tile Placement: placing tile pieces in order to get benefit in the gameplay.
8. Take That: players directly influence other players by stalling or stopping their progress within the game.



9. Commodity Speculation: purchasing and selling commodities while predicting their value in order to gain profits. The change of value may be directly affected by players actions, or by the game itself.
10. Voting: players are voting to collectively make a choice that influences the game directly.
11. Line Drawing: involve the drawing of lines as objectives, such as connecting nodes.
12. Press your luck: players repeat an action, or part of an action, until forced to stop due to some event.
13. Auction: players bid something, usually resources as currency, in order to get some benefit in the gameplay.
14. Movement: components move around the play area during the game, by rules or affected by players actions.
15. Draft: players choose a component from a limited set. This set should be available to other players on the game. The values of the component may be hidden and unknown to other players.
16. Chit Pull: a chit, token, dice roll or card draw from a stack or bag dictates player's actions.
17. Simultaneous Action Selection: players secretly choose their actions, and those actions resolve following the rules of the game.

## **2.5. Formal Elements**

Formal elements are elements that define the structure of the game. Formal Elements in the game are divided into: Players, player interaction patterns, game

objectives, rules, resources, conflicts, boundaries, and conclusions. Each of these elements can be combined into new gameplay types. (Fullerton, 2019).

### **2.5.1. Players**

A game is designed to be played by players, and the player must not be forced to accept the rules and restrictions in the game. (Fullerton, 2019, p.57-65).

According to Fullerton, a player's specifications for the game are divided into:

1. **Invitations:** inviting players into the game is an important aspect of the game, because without a player the game will not work. On board games and card games, game invitations are social activities where one player invites other players to play. In addition, the designer must think of ways to attract players to play the game.
2. **The number of players:** Games designed for one person will certainly be different with games designed for 100 people. The number of players is determined by the game itself where the structure of the game accommodates the number of players. An example is Solitaire, where the game can only accommodate one player.
3. **The role of players:** In general, the role of players in the game is the same. For example in chess and monopoly, every player has the same role. There are other games that require different roles, such as Poker, where the game requires one player as a card dealer to narrate action and distribute cards to players. In role-playing games, players can choose the roles they want to take, such as healer, or warrior. In team games, for example soccer, each player has

a role that is determined from the beginning of the game, such as goalkeeper or striker.

### **2.5.2. Interaction Pattern**

In game design, the designer must also design patterns of interaction between players in determining the number of players, game objectives, and conclusions drawn. Fullerton (2019, p.58-59) divides player interaction patterns into:

#### **1. Player vs. Game**

An interaction pattern where players play alone against the game, and the objective of the game is usually to solve challenges or stories in the game. This pattern of interaction can be found in many single player video games, where the focal point is challenge or the story.

#### **2. Multiple Player vs. Game**

Structure of this game is that some players play against challenges in the game. Actions on the game are not shown to each other, but to the game system, thus minimizing the level of competition for players. Examples of games that use this pattern are Bingo and Monster Hunter. This type of interaction pattern is suitable for games that are not competitive, or gambling types of games.

#### **3. Player vs. Player**

An interaction pattern where one player plays against another player, with the objective of beating other players. This interaction pattern is suitable for strategy type games and for competent players. This type of interaction pattern is widely used in fighting genre, such as Mortal Kombat.

#### **4. Cooperative Play**

An interaction pattern where two or more players play against the challenges of the game. An example is the raid system in some digital games, where many players fight the boss of the game within a specified time. This type of interaction can be used in non-competitive games.

#### 5. Multilateral Competition

An interaction pattern where three or more players play against each other. This pattern of interaction encourages players to have their respective roles. On board games and card games, this interaction pattern usually has a number of players from three to six people. This number is the number most often used in board games, where experts assess the number of players this is the ideal number because it optimizes the level of interactivity between players. This pattern of interaction is often also called battle royale in digital games.

#### 6. Unilateral Competition

A type of interaction pattern where one player fights two or more players, vice-versa. Examples of this game are cat and mouse or romp. This interaction patterns used to combine competitive and cooperative gameplay.

#### 7. Team Competition

A type of interaction pattern that requires more than two players to play. Players form teams, usually in equal numbers with each other, to fight other teams. The objective of this interaction pattern is to defeat other teams. This pattern of interaction emphasizes aspects of teamwork, not just one player. This pattern of interaction is often used in sports and e-sports.

### 2.5.3. Objectives

Objectives give players a reason to play the game. Objectives define what players must achieve and how to achieve *goals* in the game. A game designer must base the rules of experience to be shown to the player and the game's objectives. (Fullerton, 2019, p.68-73).

The objective of the game is to give an impression of the game and accommodate the challenges in the game. Of course, the impression of an objective game to beat other players is different from the objective game to spell words.

Fullerton divides the game's objectives into:

1. Capture: players take, capture, or destroy something from an opponent (area, unit, etc.), while avoiding the same thing happening to yourself. This objective is commonly used in area control and player elimination types of gameplay.
2. Chase: players chasing or running from other players. An example is a cat-and mouse game. Interaction patterns that relates with chase objective are single player versus game, player versus player, or unilateral competition.
3. Race: players compete to reach goals, both conceptually and physically. This type of objective can be used in strategy and opportunity type games.
4. Alignment: players arrange resources or pawns in the game according to certain configurations that benefits the players to achieving goals. Example: Tic-tac-toe, Solitaire.

5. Rescue / escape: Players save or escape objects in the game. Example: Mario Bros.
6. Forbidden act: Players compete not to perform actions that are prohibited in the rules of the game, such as laughing, moving, blinking, and so on. Example: Twister, Taboo. This objective type is rarely used in digital games due to limitations in watching fair play.
7. Construction: Players compete to arrange, create and arrange objects in the game with restrictions in the rules of the game. This objective type often uses the type of gameplay that is resource management or trading.
8. Exploration: players explores areas of the game. This type of objective is often paired with pattern recognition, memory and puzzle types of gameplay. This type of objective is often used in open-world video games.
9. Solution: the player solves a problem that is a challenge in the game.
10. Outwit: players compete to have knowledge in the game that can be used as a way to defeat opponents. This objective supports players to exploit the rules of the game.

#### **2.5.4. Rules**

Rules are an important aspect in the gameplay of a game. Rules are things that make a game unique and different from one another (Salen & Zimmerman, 2004).

According to Salen & Zimmerman, rules in games must have characteristics of the following:

1. Limiting the actions of player: rules in the game are guidelines as well as written norms in the game that maintain order during the game. For example,

when playing dice, the dice must be shuffled randomly, the player cannot deliberately place the dice.

2. Clear and unambiguous: rules must be detailed and unambiguous. When there are ambiguity due to unclear rules, then the ambiguity must be removed so that the game continues to run by clarifying the rules in the game.
3. Applies to all players and is fair: when the rules do not apply to all players, the gameplay could become unbalanced because certain players have a bigger chance to win than others.
4. Cannot be changed When the game is being played, players cannot arbitrarily and like to change the rules of the game, because it can cause irregularity and ambiguity to the gameplay.
5. Can be applied repeatedly to different players: rules can be applied to other players who play at other times. For example, in card games the rules that apply remain the same and are repeated even though the players playing are not the same.

#### **2.5.5. Resources**

*Resources* are objects in the game that have value in the game, and can help players to achieve objectives. (Fullerton, 2019). For example Yu-Gi-Oh! TCG players have a resource in the form of life points which if the value reaches 0, determines the victor in the game.

The game designer must plan how the player controls the resources in the game to maintain balance in the game and flow in the game. Resources must have uses as well as scarcity. If the resource has no use, it is not needed in the game

and is only decorative. Likewise, if the resource does not have scarcity, it will lose its value in the game. The absence of one of these aspects will make the gameplay unbalanced,

Resources can be divided into:

1. *Lives*: a classic element in the game, and commonly referred to as life. If a player loses lives, they will be categorized as losing in the game.
2. *Units*: resources in the game that function as objects arranged by the player in gameplay.
3. *Health*: resource in games that functions as elements of dramatization of lives and units. Health is a resource in the game that if exhausted or zero will reduce the lives of players.
4. *Currency*: resource in the form of currency in the game, which is used as a medium of exchange. *Currency* is an important element in maintaining the game economy.
5. *Actions*: resources in the form of movements or actions taken by players in turn. The number of Actions in a game is usually determined per turn so that it has a scarcity value.
6. *Power-ups*: resources that can increase the strength or intrinsic value of resources other. Power-ups are generally the rarest resource in a game so users are limited.
7. *Inventory*: resource that allows players to collect units.
8. *Special Terrain*: resource where players benefit from gameplay that has a system area. Example: triple letter box in Scrabble that triples the player's score.



9. *Time: resource*: resource taking form as a time limit in player's actions.

### **2.5.6. Conflict**

Conflict is a product of the actions of players who try to achieve goals in games that are set in rules and restrictions. Conflict prevents players from achieving goals in the game to maintain challenges and flow in the game, thus allowing players to develop their skills. Conflicts on the game also gives competitive element to the game, thus making the game more fun. (Fullerton, 2019).

Conflicts in the game consist of:

1. **Obstacle**: obstacles that prevent players from achieving goals so they have to look for other alternatives or develop skills to get through obstacles. Example: sharp turns on tracks car racing.
2. **Opponents**: in a game with more than one player, opponent is an opponent who competes against players to achieve goals.
3. **Dilemma**: is a mental conflict that arises when a player is faced with a choice that determines winning or losing. Example: the choice to fold or call a poker game.

### **2.5.7. Boundaries**

Boundaries are part of the regulation, which defines the boundary between the game with things outside of the game. The game designer must clearly define these boundaries. Limits can be real or conceptual. Limitation becomes a very important aspect of the game, imagine if the soccer game does not have a boundary in the form of a line area, players can run anywhere in any direction and will lead to unbalanced gameplay.

### 2.5.8. Conclusion

Conclusion is the result of a game containing an element of uncertainty to bring dramatic elements to the game. Example: a winning system in a game where the winner is not determined at the beginning of the game, thus making the player as the aspect that determines the victory itself. (Fullerton, 2019).

## 2.6. Dramatic Elements

Dramatic elements are important parts of the game elements that build a player's emotional bond to the game. Generally, dramatic elements intersect or are products of formal elements. (Fullerton, 2019). Dramatic elements in the game generally take the form of flow theory by Csikszentmihalyi.

### 2.6.1. Flow Theory

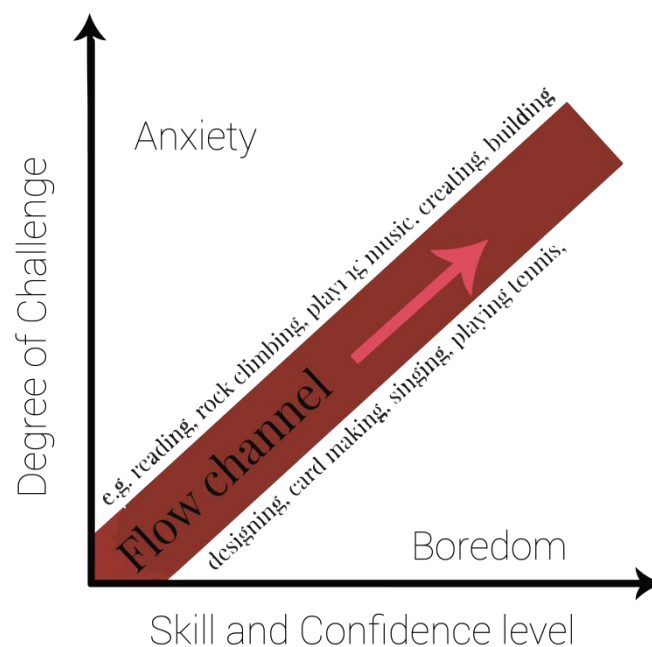


Figure 2.4 Flow Theory Graph

(Csikszentmihalyi, 1975)

Flow is a psychological theory proposed by Mihaly Csikszentmihalyi in 1975. Flow in psychology refers to the mental condition of a person who is focused, actively participating, and fully enjoying in the process the. In flow theory, the mental condition can only be achieved when there is a dynamic balance between challenges and abilities possessed by someone who is doing an activity. What is meant by dynamic is the possibility that someone can adjust the level of difficulty (challenge) in accordance with their own abilities, so that people can enjoy the activities they are living. One can also develop their ability to solve more complex problems or challenges.

A good game is a game that can keep players in the flow zone. This is explained in Theory of Fun stated by Raph Koster, an American game designer, where entertainment in games comes from mastering the skill (ability) to solve problems or win challenges.

According to Csikszentmihalyi, there are three conditions regarding the condition of mental flow, namely:

1. One must carry out activities that require a certain level of ability to overcome the challenges presented.
2. These activities must have clear goals.
3. The results of these activities are open ended, the results depend on the actions taken by the player, thus giving the player a sense of control over a situation, but in fact the player has no direct control over the results (paradox of control).

When these conditions are met, then the player who is in a state of flow will have the following effects:

1. Spontaneous actions and reactions, consciousness and thoughts become one.
2. In a state of total focus, players can concentrate quickly on the problems and challenges presented.
3. Players will forget the time and are not aware of the surroundings because they are immersed in the game.
4. The experience gained by players is not long-term, but rather fixated on the game. When the game is finished, the flow of state also finished.

## **2.7. Illustration**

Illustration is a production of visually communicative content in imaginative, distinctive, yet highly personal ways to solve problems, decorate, entertain, adorn, comment, inform, inspire, explain, educate, provoke, beguile, enchant, and storytell. (Wigan, 2009).

Illustration differs slightly from design, whilst design mostly relies on a set of element (see elements of design, p.57), then organizes them in an engaging compositions to focus the attention of the viewer on a certain visual concept, illustration is the production of the imagery, and not necessarily work on the whole design, and often accompanied by descriptions in order to further explain the illustration. (Nikolaeva, 2017).

In order to illustrate, the designer needs to research information, with the purpose of acquisition of information for subject. and to help illustrate the object of the design. The method of research could be any of the following examples or a

combination: library and database access, the Internet, fieldwork, studio work, interviews. (Male, 2017).

### **2.7.1. Visual Notes**

Visual note is used as reference at a later stage or to specify the consistency of objects of illustration. The most common practice of visual note taking is to draw on location and document or record of illustration objects, either could appear as imagery used in published form that was actually produced on site, or in the sketchbook. (Male, 2017).

### **2.7.2. Illustration Styles**

According to Nikolaeva (2017), styles in illustration means different genres in illustrations, used for the individual to express the individual artists. Styles and illustration can be classified as:

#### **1. Concept Art**

Includes Fantasy illustrations, illustrations for Gaming, Animation and One-Pager Fine Illustrations. In concept illustration, artists creates interpretations of a certain theme, from which the client choose from and see the different stages, development and the process of creation of the illustration.



Figure 2.5 Concept Art Illustration Example  
([graphicmama.com/blog/types-of-illustration](http://graphicmama.com/blog/types-of-illustration))

## 2. Children

Children illustration style can be very diverse – from realistic, full with details illustrations to very simplified, child-like, naive drawings. The style depends on the story, the target user’s age, and many more. Children illustrations are colorful, and narrating. The characters are cute and friendly.



Figure 2.6 Children Illustration Example  
([graphicmama.com/blog/types-of-illustration](http://graphicmama.com/blog/types-of-illustration))

## 3. Comics/graphic novels

Comic is a medium used to express ideas by images, combined with text or other visual information. Comics takes the form of sequences of panels of images, with the help of textual devices such as speech balloons, captions, monologue, dialogue, narration, sound effects, or other information. Size and arrangement of panels contribute to narrative pacing. Cartooning and similar forms of illustration are the most common image-making means in comics.



Figure 2.7 Comics and Graphic Novel Illustration Example  
([graphicmama.com/blog/types-of-illustration](http://graphicmama.com/blog/types-of-illustration))

#### 4. Books/publications/editorial

This style depends on the vision of the author and the subject of the book. Illustrators try to create eye-catching covers in order to compete with other books in order to catch the viewer's attention, giving a hint of what is inside the book.



Figure 2.8 Book/publication/editorial illustration example  
([graphicmama.com/blog/types-of-illustration](http://graphicmama.com/blog/types-of-illustration))

## 5. Advertising

Advertising style of illustration is meant to grab the user's attention and make a lasting impression on one big idea or brand/product. Many companies choose illustration as the medium to send their message to the audience, because the style better translates the idea than photography.

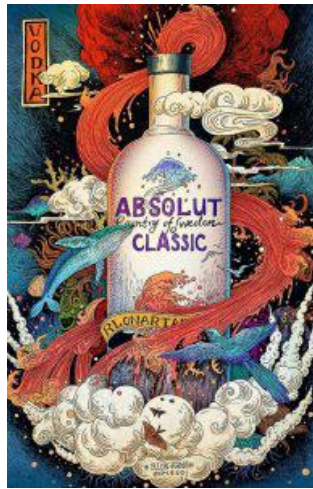


Figure 2.9 Advertising illustration example  
([graphicmama.com/blog/types-of-illustration](http://graphicmama.com/blog/types-of-illustration))

## 6. Packaging

This style has a personalized touch, elegance and custom feel for businesses such as jewelry, bakery, children's products, depending on the context of the product.





Figure 2.10 Packaging Illustration Example  
([graphicmama.com/blog/types-of-illustration](http://graphicmama.com/blog/types-of-illustration))

## 7. Branding/logo

Branding/Logo type of illustration should be simple, yet grabbing attention and memorable. It also requires to be recognizable and readable at smaller sizes.

Brand/logo illustration is more than just a logo illustration, but can also be mascots, cartoonized version of employees or products.



Figure 2.11 Branding illustration example  
([graphicmama.com/blog/types-of-illustration](http://graphicmama.com/blog/types-of-illustration))

## 2.8. Brand Key

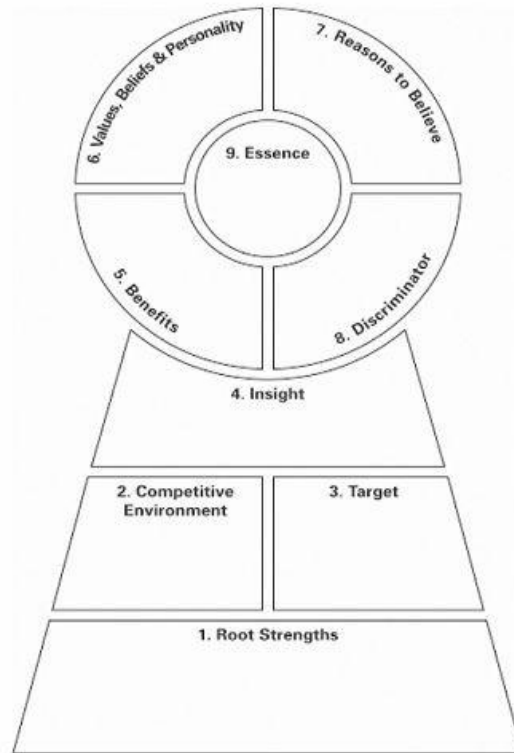


Figure 2.12 Brand key model

In order to find the idea of the design and the identification of the problem, brand Key model by Miecznikowski (2016). This model is chosen because it helps strategically define the value of the design to the subjects. The key is divided into 9 different aspects:

### 1. Root Strengths

Basic strengths of the design, describing the positioning of the product. In this research, the author chooses card game as a medium of serious games as means for edutainment.

### 2. Competitive Environment

A brief statement of primary competitors.

### 3. Target

A brief overview of the target group. In this case, the target is high school students, who want a quick, fun, and simple way of information.

### 4. Insight

A description of unmet needs or unresolved potential customer, in this case is the design idea.

### 5. Benefits

What benefits the game gives the consumer. Benefits are divided into functional and emotional benefits.

### 6. Discriminator

What differs the product from other from competitors.

### 7. Reasons to believe

Features that support the benefits. At this stage of the process, the designer needs to find an argument describing why customers would choose the product.

### 8. Values

Brand personalities as values to attract customers and make the brand more recognizable.

### 9. Essence

Essence is the big idea of the design overall, using every other aspects to create a two-three words description of what the design is about.

## **2.9. Visual Styles**

Visual styles is one of the important aspects that exists in a game, and takes a large part of the experience as a visual representation of objects or characters in

the game. In a game, visual styles are often also referred to as graphics, especially in digital games (Christensson, 2009).

Throughout the history of both conventional and digital games, many methods have been used in visualizing a game object. These methods are referred to as graphical styles which is a presentation of the content the game presents to the player (Lee & Hammer, 2016).

Various experts in the field of gaming such as Järvinen (2009), McLaughlin, Smith & Brown (2010) and Egenfeldt-Nielsen (2015) determined that there are 3 main categories in visual styles in games. The categories are: Abstract, Stylized, and Realistic.

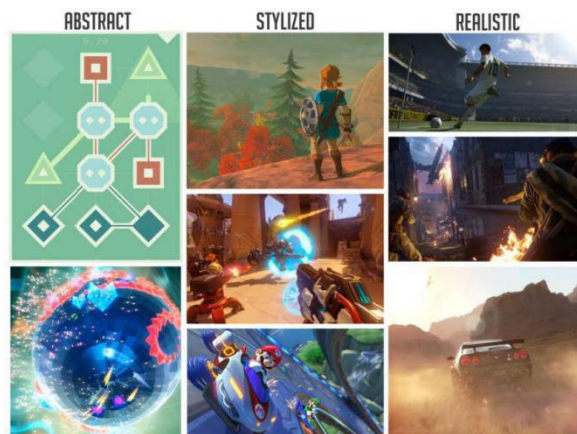


Figure 2.13 3 Main Categories of Visual Styles in The Game

### 2.9.1. Abstract

Abstract is a graphic style that directs the game to a geometric representation, not a picture in general. (Järvinen, 2009) Nowadays, abstract styles are rarely used, due to the popularity of storytelling in games that makes abstract styles difficult to market. (Egenfeldt-Nielsen, 2015). However, this does not mean abstract styles are not used at all in modern games. One example of a card game successful in

using abstract style is Uno (1992). The factor that made Uno successful was due to the type of game that focused on simple challenges (spending a pair of cards), as well as the lack of storytelling aspects.



Figure 2.14 Uno

(source:<https://www.wopc.co.uk/games/uno> )

### 2.9.2. Stylized

Stylized style focuses on the representation of humans or objects by exaggerating hyperbole to the main characteristics of the object. (Egenfeldt-Nielsen, 2015). Because this style has been around for a long time and its implementation in games can be done with a variety of approaches, this style is more widely used in various games of all time. Usually the stylized style is used in two-dimensional games and board games.

More visual approach means more choices so designers can use these styles more freely but are more specific to the goals and targets of the user. This style provides more specific immersion so as to provide a more conical experience

in the game by giving accent to the image or object without losing the harmony of the atmosphere. (Järvinen, 2009) An example is when a designer wants to make a design especially for children, he will emphasize the visual style of objects and atmosphere that the child thinks is interesting.



Figure 2.15 In The Game Yu-Gi-Oh! Tcg (1999), Visual Emphasis Is Placed On Monster Characters That Are Portrayed In a Variety Of Styles, From Simple, Funny, To Complicated And Spooky So That They Appeal To Teens And Even Adults.

(Source: /Http://Yugioh.Wikia.Com)

### 2.9.3. Realistic

Realistic style in art and literature is a representation of a subject without idealization. Realism pursues the reproduction of as realistic images as possible on the original image. Realism can be divided into two, namely televisionism and illusionism. (Järvinen, 2009) Televisionism pursues graphic reproduction as in television that uses cameras and is linked to realistic activities. Illusionism on the

other hand pursues simulations of realism on non-realistic (fictional) situations and activities, for example the film Game of Thrones and the game The Witcher.

The problem that often occurs in the use of realistic styles is the inability to simulate realism perfectly due to hardware, time, and skill constraints, causing inaccuracies. (Orland, 2012). In addition, even though the characters and objects in the game are made as closely as possible to the original, many people still feel there is something lacking and artificial, even because of small things like eye movements, anatomy, or rigid expressions. This phenomenon is called Uncanny Valley.(Mori, 1970).

### 2.8.3.1 Uncanny Valley

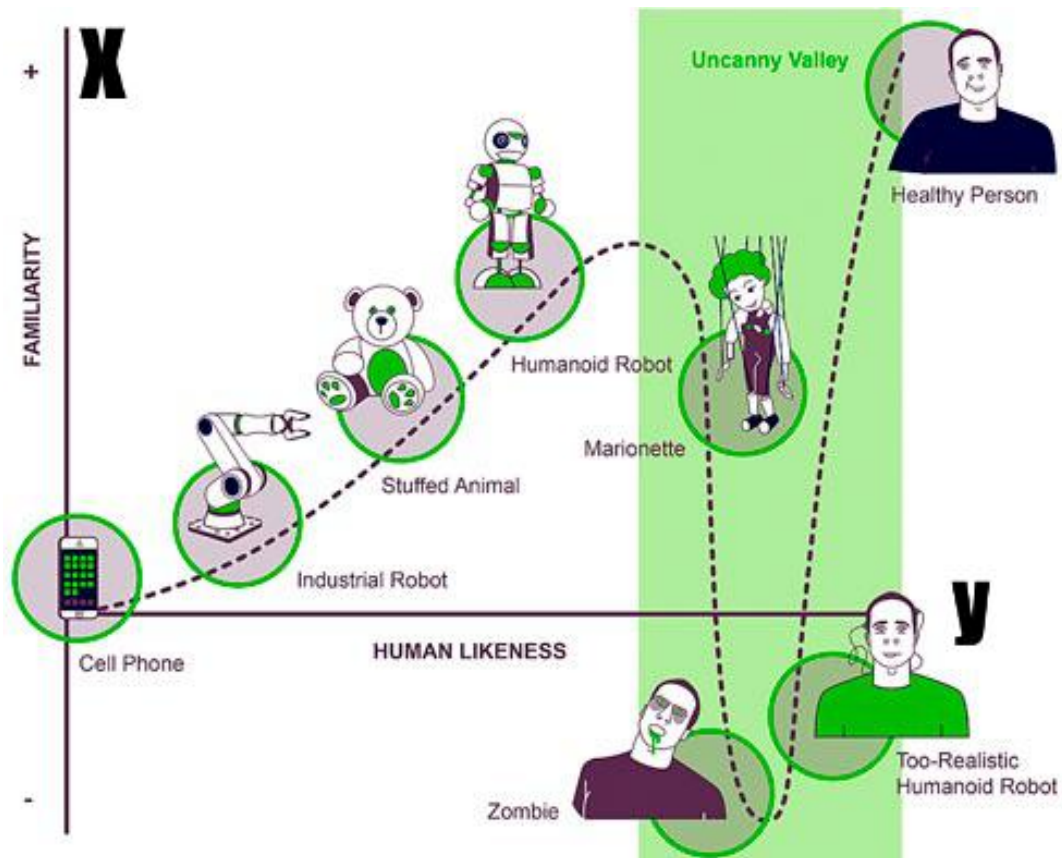


Figure 2.16 Uncanny Valley graph

(source: <https://www.therobotreport.com/a-pragmatic-spin-on-the-uncanny-valley-theory/>)

Continuing from theories about visual styles, Uncanny Valley is a concept that raises human perception about something that resembles humans. This concept shows that, the more something resembles a human, the greater the discomfort caused by something in the observer (human) itself (Mori, 2003). For example, when faced with a replica wax statue of a human, the writer feels there is an oddity and an uncomfortable feeling.



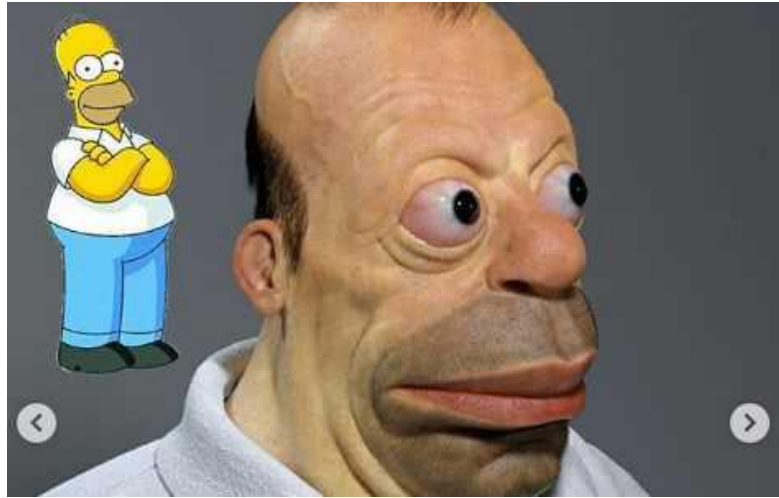


Figure 2.17 A cartoon character, Homer Simpson when made to resemble humans makes discomfort for observers.

(source: 3D artist Miguel Vasquez: [pic.twitter.com/NVkyO65ItC](https://pic.twitter.com/NVkyO65ItC))

Based on an article in National Geographic Indonesia, Professor of Computer Science and psychology, Jonathan Gratch, explains that when we are dealing with something that is close to reality, then we will respond with expectations of something. When humans are faced with the expectation that something is human, it turns out that it is not a human, then we will feel uncomfortable.

In figure 2.8, it is shown that on the x-axis is something that resembles humans and the y-axis is our reaction to the object. At the beginning of the graph it is shown that industrial robots up to humanoid robots respond positively to one's feelings. However, when things start to approach humans but not humans, like zombies, the graph shows negative reactions and decreased interest (Mori, 2003).

## 2.10. Elements of Design

Elements of design are the most basic form in a design in which is used in accordance and in harmony with one another in order to communicate and express a design. (Landa, 2018, p.15-18). Landa divides the elements of design into:

1. Lines: connection between two or more points across a certain distance. A line is not always straight, as it can form curves and angles and can be used to help users navigate through a design.
2. Shapes: the combination of lines forms a shape. A shape can be recognized by the outline and the use of colors. There are different kind of shapes, namely geometric and organic. Geometric shapes are more stoic and has angles, such as rectangle, triangle, hexagons, with volumetric formation such as cubes, pyramids, prisms. Organic shapes looks more natural and fluid.

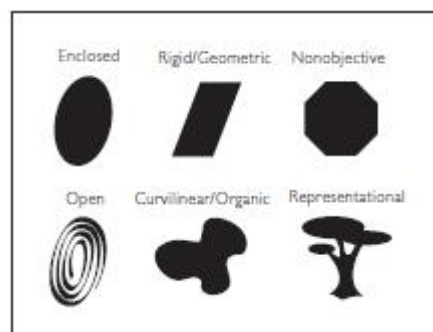


Figure 2.18 Type of Shapes  
(Landa, 2018)

3. Figure and Ground: interconnection between shape and figure with its background within a 2-dimensional surface, usually called positive negative space. Human has the tendency to separate the two while focusing on the figure of the image or design.



Figure 2.19 The Usage of Figure and Ground  
(Landa, 2018)

### 2.11. Design principles

Design principles are important elements in visual design, especially in the user experience of a design. The design principle is used to reduce the user's cognitive load so as to facilitate decision making. Another use of the use of design principles is to optimize the use, perception, influence, visualization, and effectiveness of designs. (White, 2011).

According to White, is seven design principles that can be applied, namely:

1. Unity and Harmony: setting right on other design principles to provide harmony and unity as a whole. According to White, the ultimate goal of all designs is to achieve unity and harmony.
2. Balance : design elements have a weight, and balance is a condition where the elements have an equal visual weight distribution.

3. Hierarchy: the arrangement of text and images in the design is in order of importance.
4. Proportion: the use of different design element sizes to emphasize or focus an object of design.
5. Repetition and Rhythm: strengthen the overall visualization of the design by connecting different design elements to make it look organized and consistent. Repetition and rhythm can be achieved through linear repetition, alternation, gradation, or complicated shapes.
6. Emphasis: Emphasis is used to control the focus and attention of users on an object of design, by distinguishing the size, color, style or shape.
7. Space of contrast and similarity: Used as an emphasis on design objects and design effectiveness. Contrast and similarity must be balanced and not burdensome on one side. Designs that are too similar will be boring and designs that are too contrasting will reap incompatibility. The use of negative space is an example of the use of contrast and similarity in the space of good design

## **2.12. Layout**

Layout in design is an arrangement of the elements of design in the form of text and images on a design work so that the delivery of information becomes communicative and effective (Landa, 2016).

### 2.12.1. Grid System

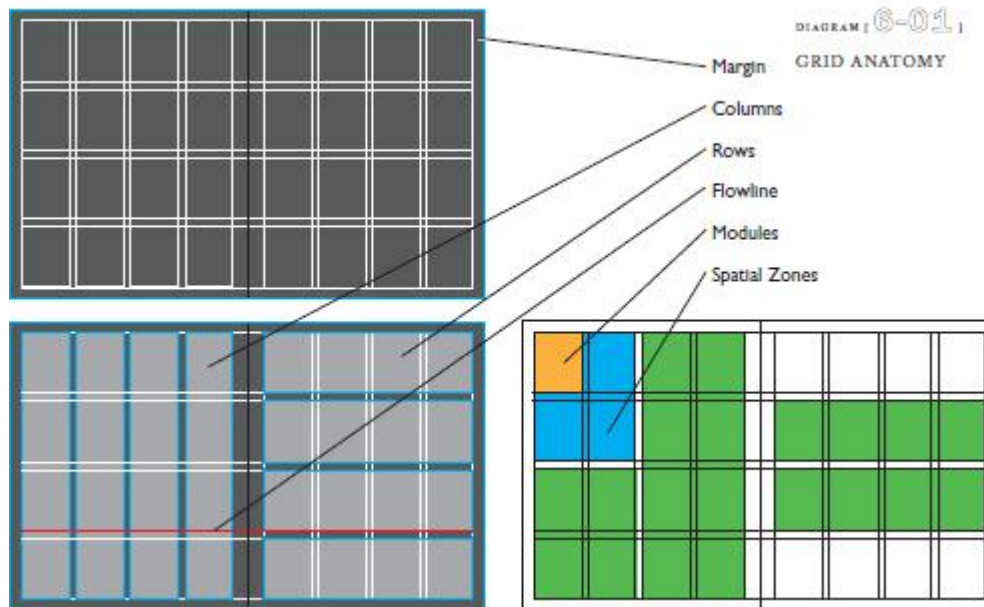


Figure 2.20 The Anatomy of Grid System

(Landa, 2018)

The grid system is the base guideline of creating a layout in a design. It helps to compose a design by reaching visual hierarchy. (Landa, 2018, p.158-162).

According to Graver & Jura (2012), there are six basic structures in the layout of grids, namely:

1. Single column / manuscript grids, layout utilization with one column without borders on layout content.
2. Multicolumn grids, the use of layouts with multiple columns to organize varied content.
3. Modular grids, the use of boundaries between columns and lines so as to bring up horizontal and vertical orientations.
4. Hierarchical grids, the emphasis of certain objects on the layout content.

Usually used for specific visual design.

5. Baseline grid, the use of consistency of text elements that create a sequence of sequences.
6. Compound grid, the use of several layout structures while maintaining the area and margins of these structures.

### **2.12.2. Layout in Card Games**

Layouts on card games are used to optimize user experience for said games, such as readability, and visual hierarchy. (Mangini, 2018). There are 4 main layout applications used in card games, namely:

1. Space: a card's layout should have enough spacing so players can visually distinguish important information at a glance. This allows the player to learn cards faster and spend their time actually playing the game rather than just understanding the game.
2. Visual hierarchy: showing the most important information first on a card based on how much impact they give in the gameplay by using color, location, shape, scale or combining them to add visual interest and focus the player's attention on particular information.
3. User Interface/User Experience: matching the layout and interface on the card based on the gameplay used. Example: if the card is played mainly on the hand and stacking with each other, the main interface should be on the corner, so that it is easier to see all of the relevant information when you fan the cards out in your hand.



Figure 2.21 Remy Cards With Suits and Numbers on the Corner for Better UX.  
(<https://medium.com/@dylanmangini/4-layout-tips-for-designing-card-games-17cc98b89b96>)

4. Font: needs to be as simple as well as readable. A good rule of thumb is to treat text using complicated fonts as artwork rather than copy. Relatively, font sizes below 10pt introduce accessibility issues for the visually impaired and is hard to read. If the text can not fit its bounding box, the text might need rewording, by using a condensed typeface, or changing the size of the text box itself. The spacing of the font is needed to leave ample space between the text and its borders, and to create room between each line of text for readability aspects. Spacings for card game should be about 1.4–1.5x the font size.

### 2.13. Color Theory

Color is an important aspect of design, because color attracts attention. When an ad uses for the vibrant colors (colorful) will generally be more interesting than

colorless. Color increases the efficiency and value of memory in layout. Color is divided into 3 main properties based on Munsell's theory of colors, namely: hue, value, and chroma. Hue is the name of a color (red or green, blue or orange). Value is the level of luminosity of a color, for instance, light blue or dark red. Shade, tone, and tint, are different aspects of luminosity. Chroma and intensity are synonyms for saturation, which is the dullness of a color. (Landa, 2016).

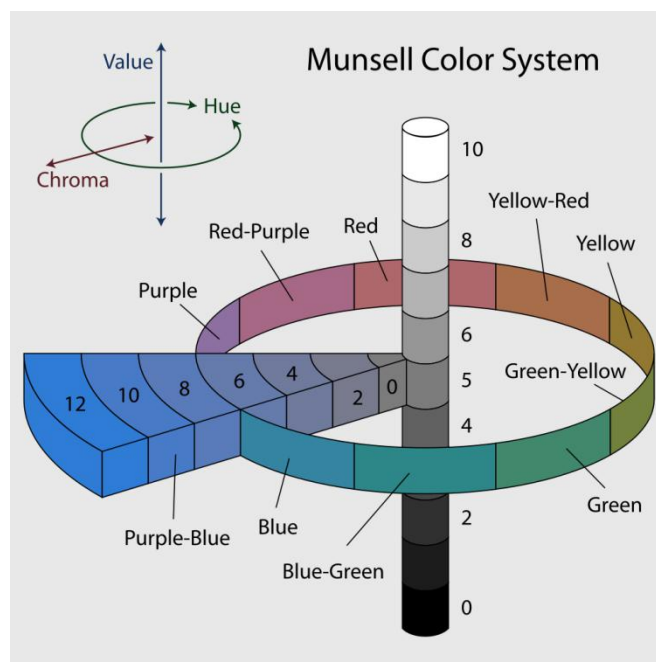


Figure 2.22 Munsell Color System

### 2.13.1. Color Characteristics

Townsend (2017), divides colors into two categories based on temperature, namely warm color and cool color. Warm color covers the spectrum of colors from red to yellow. As the name implies, warm color makes people remember about something warm, like sunlight. Cool color covers the spectrum of colors



from green to purple. If warm color is reminiscent of warmth, cool color is reminiscent of coolness, such as water, sky, snow or ice.

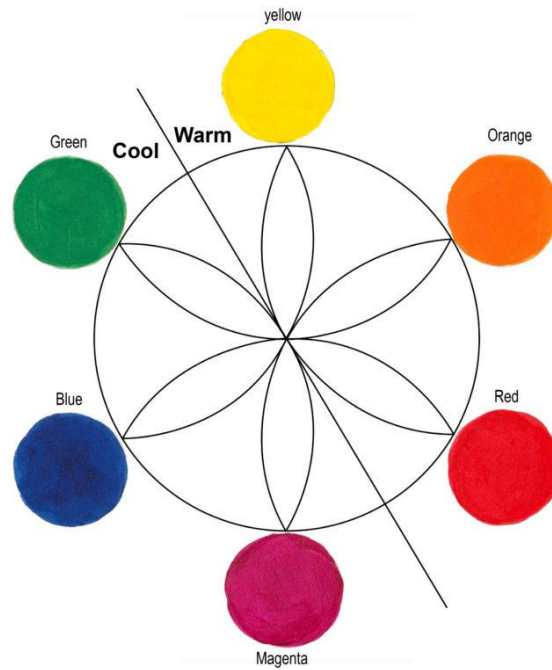


Figure 2.23 Warm Colors and Cool Colors  
(NCS, 2013)

According to Chen (2013), color has a representation of emotions that can be used to emphasize information in a design work. Chen conducted research to find the relationship between emotions and color by assigning 20 people aged 23-35 who live in urban areas, to match the natural color color system with several categories of emotions that have been given.

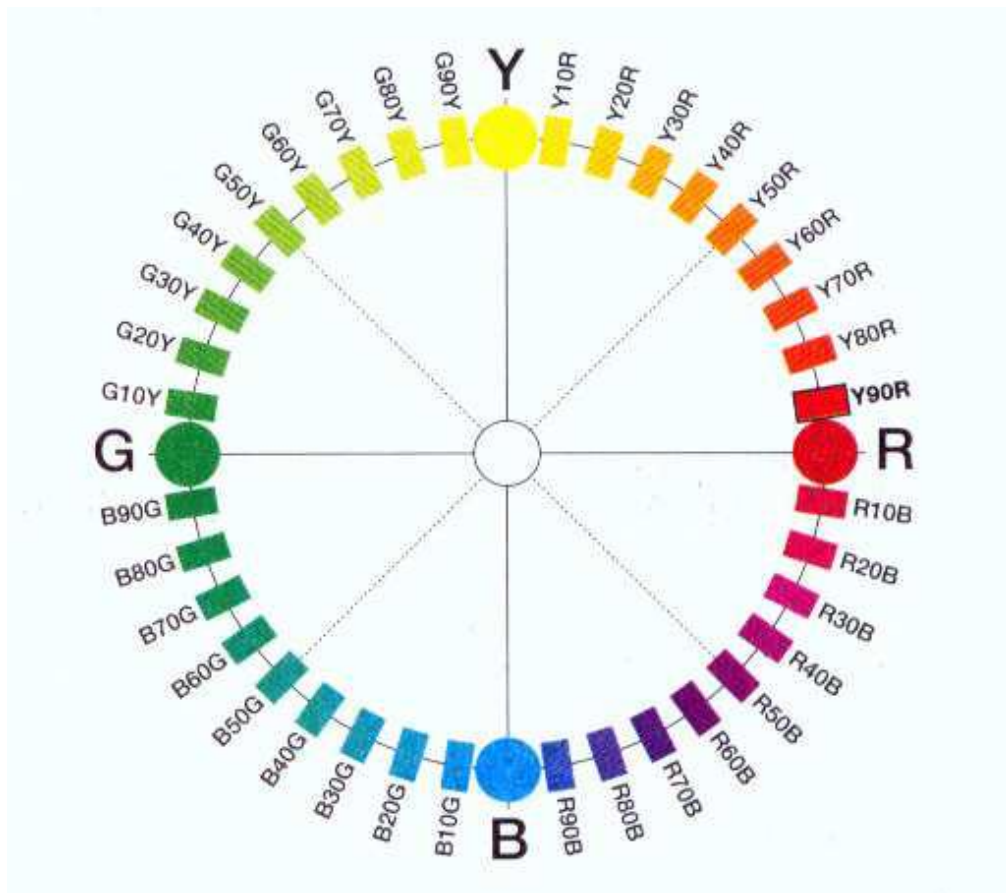


Figure 2.24 Color Diagram Used, Natural Color System.  
(Chen, 2013)

Table 2.1 Emotion Category.  
(Chen, 2013)

Touchy	Aggressive	Excitable	Active	Outgoing	Leadership
Calm	Reliable	Thoughtful	Passive	Quiet	Anxious

Table 2.2 Results From the Categories of Emotions that Have Been Matched to the Natural Color System by 20 Subjects.

(Chen, 2013)

Emotion descriptors	NCS colours				
<b>Touchy</b>	Y (8)	Y40R (8)	Y80R (4)		
<b>Aggressive</b>	Y80R (8)	R (4)	R10B (8)		
<b>Excitable</b>	Y60R (12)	Y70R (4)	Y80R (4)		
<b>Active</b>	Y90R (15)	R (5)			
<b>Outgoing</b>	Y60R (7)	Y80R (3)	R10B (10)		
<b>Leadership</b>	R10B (10)	R90B (10)			
<b>Calm</b>	R80B (5)	R90B (7)	B (5)	B20G (2)	B30G (1)
<b>Reliable</b>	R70B (5)	R80B (7)	B50G (8)		
<b>Thoughtful</b>	Y10R (3)	Y40R (5)	B70G (7)	G (5)	
<b>Passive</b>	B (7)	B70G (5)	B90G (8)		
<b>Quiet</b>	R70B (3)	R90B (7)	B50G (2)	G10Y (8)	
<b>Anxious</b>	Y30R (2)	Y60R (8)	R (8)	G80Y (2)	

From the results of this research we can see that, warm color (g60y-r40b) represents sensitive emotions, aggressive, fun, active, friendly and leadership. Whereas cool color (g40y-r60b) represents calm, dependable, thinking, passive, mysterious, quiet, anxious, anxious, and sad emotions.

## 2.14. Typography

Typography is an important aspect of a design that helps to set the mood, emotions, and helps to build opinions about a design. Example: people will prefer free column text in graphic design magazines than column text in very dense newspapers. (Sadko, 2017).

### 2.14.1. Typeface Characteristic

According to Kolenda (2016), humans unconsciously associate forms, in this case the fonts, to the things they perceive. For example, Kang and Choi (2013), conducted an experiment on a mobile phone advertisement, when the 'slender' trait

wanted to be delivered, condensed fonts are more effective than the decorative types. However, when the trait delivered was changed to 'elegant', decorative type typography is more effective than solid types.

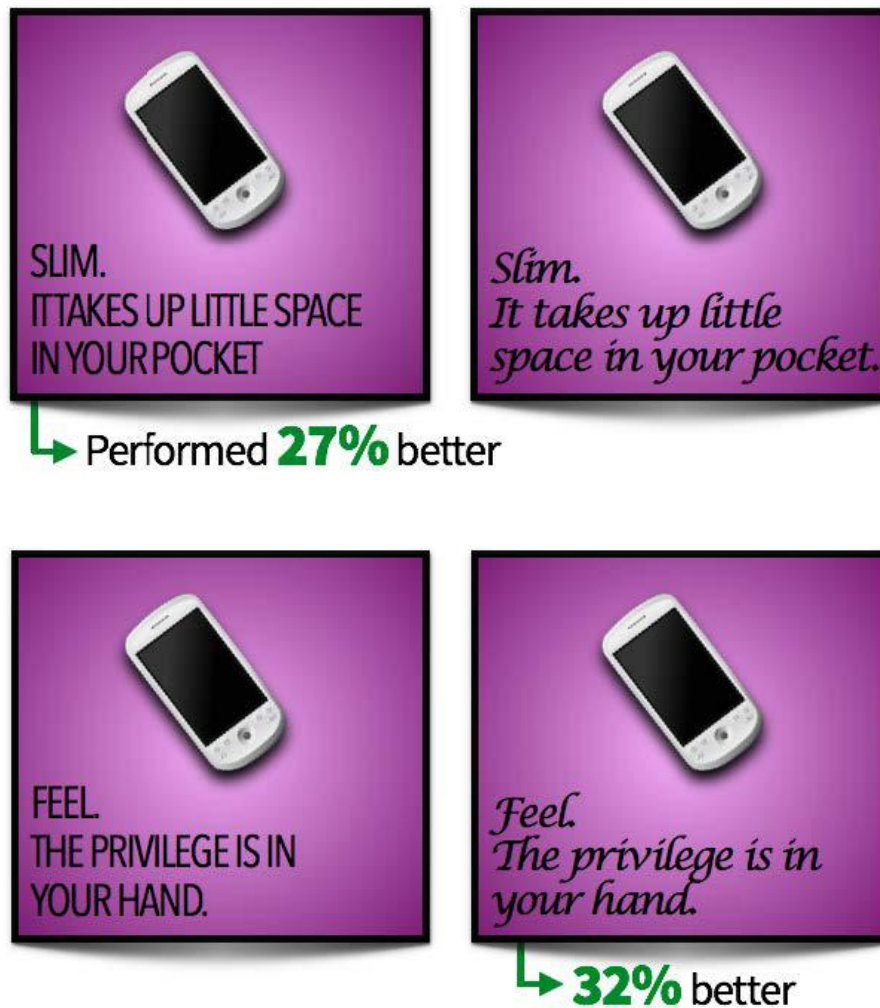


Figure 2.25 Performance Font based on Characteristics

(source: Kolenda, 2016)

Kolenda divides font characteristics into 18, where half of these characteristics have visually opposite characteristics to each other.

## 2.14.2. The Use of Typeface Based on Characteristics

### 1. Serif vs. Sans-serif



Figure 2.26 Serif vs. Sans-serif

(source: Kolenda, 2016)

The use of serif type fonts is formal and elegant, while the use of sans-serif fonts is informal and innovative. In general, the use of serif fonts is for formal and scientific subjects. (Tantillo, Lorenzo-Aiss, & Mathisen, 1995).

### 2. Light vs. Bold



Figure 2.27 Light vs. Bold

(source: Kolenda, 2016)

fonts of type are light usually associated with elegant and feminine qualities, while bold type fonts are associated with strong, coarse, and masculine qualities. (Lieven, 2015).

### 3. Rounded vs. Angular



Figure 2.28 Rounded vs. Angular

(source: Kolenda, 2016)

Rounded font is associated with a delicate nature, comfortable and femininity, while the angular-type is associated with formal, bitterness, and masculinity. (Lieven, 2015).

#### 4. Simple vs. Complex



Figure 2.29 Simple vs. Complex

(source: Kolenda, 2016)

Simple type fonts are associated with frankness, straight and rigid, while the complex manifold does not have specific properties for most of the font type has typeface its respective that can be associated with font. any other type. (Li, 2009).

#### 5. Slanted vs. Straight



Figure 2.30 Slanted vs. Straight

(source: Kolenda, 2016)

Slanted type fonts are associated with the nature of movement, and speed, while straight type fonts are associated with stability, rigid, and hardness. (Walker, 2015).

## 6. Lowercase vs. Uppercase



Figure 2.31 Lowercase vs. Uppercase

(source: Kolenda, 2016)

Oosterhout (2013), said that lowercase letters tend to be effective for designs that prioritize aspects of caring and humility, while capital letters are heroism, courage, and focus.

## 7. Separated vs. Connected



Figure 2.32 Separated vs. Connected

(source: Kolenda, 2016)

Kolenda (2016) says that separate letters have the nature of fragmentation and individuality, while conjunctions have the nature of unity, closeness, and collectivity.

## 8. Condensed vs. Extended



Figure 2.33 Condensed vs. Extended

(source: Kolenda, 2016)

The dense arrangement of letters has the nature of precision and narrowness, while the arrangement of letters that is tenuous has the nature of loose, relieved and relaxed. (Kang & Choi, 2013).

## 9. Short vs. Tall



Figure 2.34 Short vs. Tall

(source: Kolenda, 2016)

Short letters take the concept of the force metaphor of gravity so as to describe the nature of weight and stability, while high letters describe the nature of light and luxury.(Kang & Choi, 2013).

### 2.15. Logo

Logo is an identifier in the form of symbolization of something, namely a product, media, organization, idea, business,etc. A logo should clearly represent an organization's identity. In order to make a good logo, certain aspects should be taken into consideration; (1) it should be simple, (2) readable at small and large scale, (3) effective in black and white. The symbolic meaning of a logo is used to represent an idea, for example: in the Apple logo, the apple is a symbol of knowledge. The “byte” taken out of the apple could symbolize you taking a bite out of knowledge.



Figure 2.35 The Apple logo



## 2.16. Card Dimensions

According to PrintNinja, a printing company, in general, game card sizes can be divided into 4 based on their use, namely:

1. Poker: 6.35cm x 8.89cm, used for card games that require players to hold several cards at the same time.



Figure 2.36 Poker sized cards.

(source:<https://www.printninja.com/printing-resource-center/printing-options/custom-game-printing/card-dimensions>)

2. Tarot: 6,985cm x 12,065cm, used for card games that require two decks with different functions. Generally, tarot-sized cards are used to represent characters, while poker-sized cards are used as resources.



Figure 2.37 Tarot cards compared to a standard poker card.

(source:<https://www.printninja.com/printing-resource-center/printing-options/custom-game-printing/card-dimensions>)

3. Mini style: 4.191cm x 6.35cm, generally used for card games especially for children, due to smaller palm size, card games that emphasize portability, or to differentiate card functions such as tarot.



Figure 2.38 Mini Sized Cards

(source:<https://www.printninja.com/printing-resource-center/printing-options/custom-game-printing/card-dimensions>)

4. Square style: 6.35cm x 6.35cm, this size is generally used for card games that have a way of playing draw pile, and for children's games because this size is easier to draw, or for card games that have a playing method arrange cards in a grid.



Figure 2.39 Square size cards

(source:<https://www.printninja.com/printing-resource-center/printing-options/custom-game-printing/card-dimensions>)

## **2.17. Career Development**

Careers are a series of individual processes in work achieved by a person within a certain period of time relating to attitudes, values, behavior and motivation. Career describes the role or status of an individual relating to work that has a value of responsibility. (Ekaningrum, 2002).

Career development is a condition that indicates an increase in the status of a person in the work and career that he took. Career development includes career management and career planning. The things that encourage a person to develop a career can be known through personality assessments such as experience and individual background. (Sumitro, 2001).

According to the career center of University of Texas at Dallas, there are 5 phases of career development:

1. Assessing self preferences: Understanding self, skills, interests and values.
2. Exploring options: Proactively identifying, understanding and matching self to the possibilities.
3. Developing skills and experience: Building skills, knowledge and reputation.
4. Marketing self: Obtaining the skills to seek, obtain, maintain and change jobs.
5. Performing and planning next steps: Developing the skills to make effective career-related decisions and career transitions.



Figure 2.40 Model of Career Development  
 (source <https://www.utdallas.edu/career/model/>)

### 2.17.1. Jobs and Employment

According to Ornstein and Levine (2008), work is part of a career carried out in life. Workers are residents who are of working age. According to Law No. 13 of 2003 concerning manpower, what is referred to as labor is anyone who is able to do work to produce goods or services to meet their own needs as well as the community. Generally, labor based on quality can be divided into:

1. Educated workers: workers who have an expertise or expertise in a field by means of formal or informal education. Example: Doctor, teacher, lawyer, designer.
2. Trained workers: workers who have a skill through work experience. Examples: mechanics, surgeons, public relations.

- Uneducated and untrained workforce: workers who only rely on labor without the need for education or training.

According to Indonesian Labour Organization, the ideal job sector according to degree (university) obtained are:

- |                                    |                          |
|------------------------------------|--------------------------|
| 1. Communication and Technology    | 6. Retail                |
| 2. Monetary and Insurance services | 7. Health and Social     |
| 3. Manufacturing                   | 8. Construction          |
| 4. Education                       | 9. Hotel and Restaurant  |
| 5. Art and Entertainment           | 10. Science and Research |

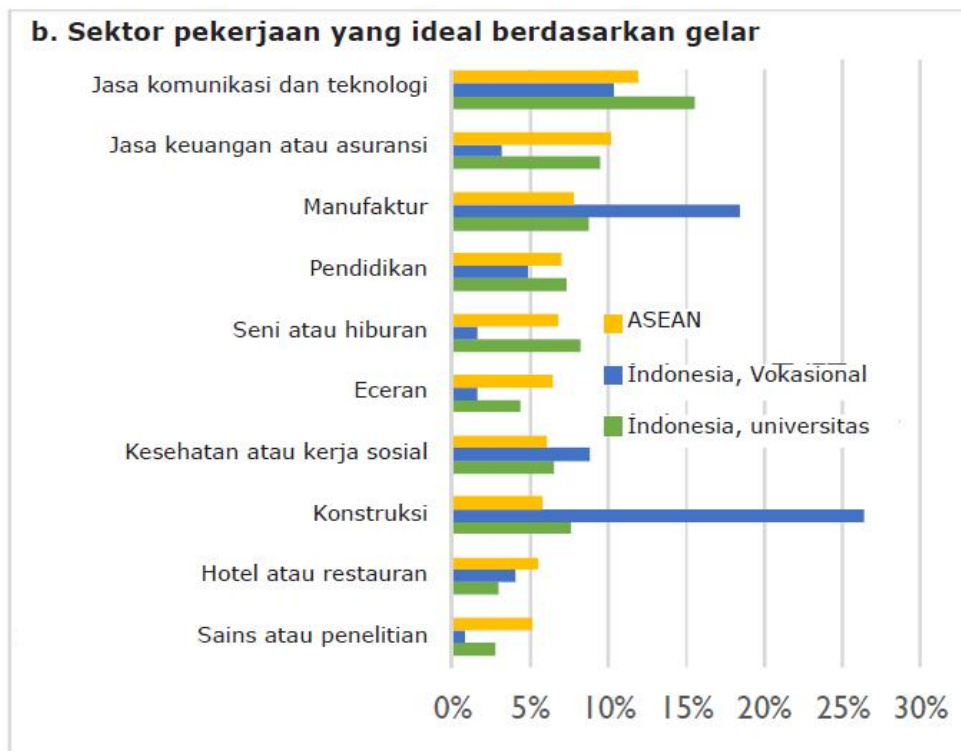


Figure 2.41 Job Sectors in Indonesia Based on Degree  
(source: ILO, 2017)

### 2.17.2. University

University is an education institution for higher education or research, which awards academic degrees towards graduates under academic circumstances. According to Rencanamu, the sooner an individual plans, knows their skills, abilities, and choice on university matters, the better. Applying to university is not just for obtaining degree and money, but also for developing career and certain important skills like self-exploration, working and adapting under pressure, social networking, and giving yourself a significant life experience.

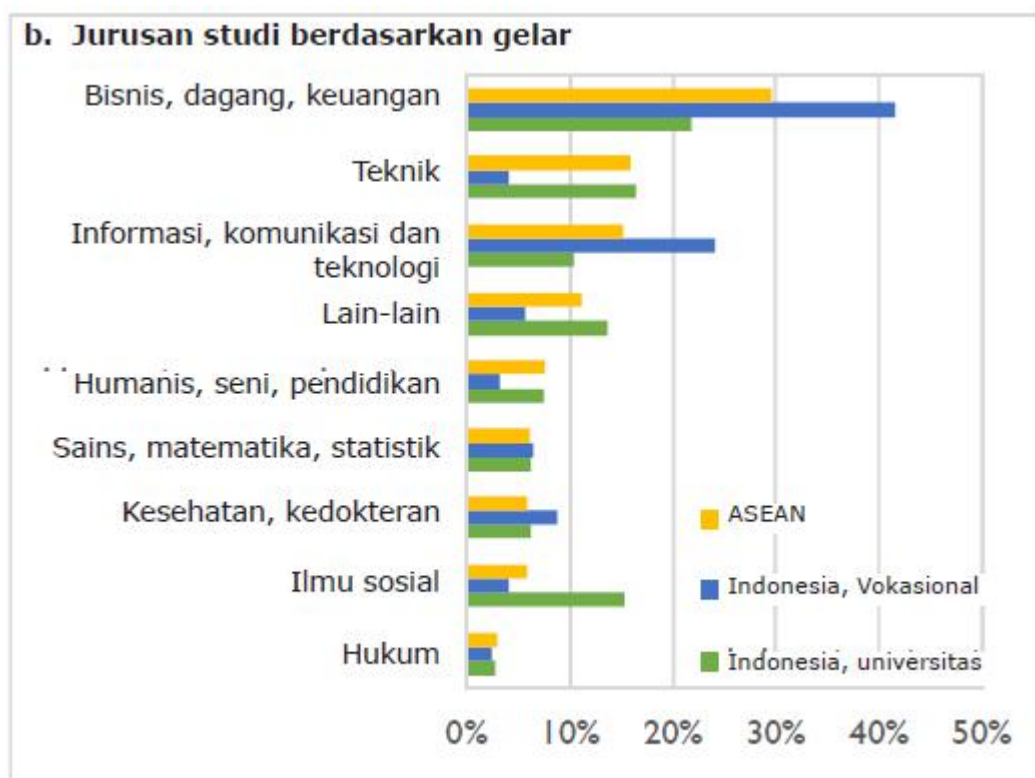


Figure 2.42 Education Major in Indonesia Based on Degree

(source: ILO, 2017)

### **2.17.3. Choosing University Majors**

In choosing university majors, there are several steps that should be taken. According to Rencanamu, the steps are similar with the model of career development, which are:

#### **1. Knowing one's personality, potential, skills and abilities**

The most important step, which requires one to know their own personality, their interest, their skills and abilities. One needs to decipher and unify these three factors in order to choose the right major for them. This step can be acquired from personality tests, interest and talent tests, and other psychological tests.

#### **2. Exploration**

The step to identify, understand and match the options. One needs to understand more than meets the eye about their options in university majors, such as what will be studied, how long the education will be, the facilities, the terms and conditions, and the long term results like possible competition the career prospects.

#### **3. Discussion**

Discussion means reasoning the options by communicating with other parties that may affect your choice, like parents, teachers, and friends. One should explain the reasons logically by providing the previous steps. This step functions as a comparison so that one should choose in a more objective manner.