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Emotion Recognition Board Game Design for Adolescent

Christian Vincent Santoso¹ and Nadia Mahatmi¹

¹ Visual Communication Design Department, Universitas Multimedia Nusantara, Scientia Boulevard Gading, Curug Sangereng, Serpong, Kab. Tangerang, Banten 15810, Indonesia
christian.vincent@student.umn.ac.id

Abstract. Emotions refer to special thoughts and feelings psychologically and biologically to carry out an action. Emotions affect the development of every human being, especially during adolescence. This is because adolescents still have imperfect thoughts so they often feel confused about what they are experiencing, one of which is emotion. Adolescent who feel confused about their emotions can think about themselves so that it makes them feel apprehension, to mental illness caused by excessive anxiety. Emotion recognition needs to be done in order to reduce the occurrence of mental illness that is caused emotionally. The author chose to create board game-based interactive media to introduce emotions to adolescents because board games are an effective medium of information. The design methodology that the author uses is Ideation, Theme-driven vs Mechanic-driven, Card Game vs Board Game, Reality Check, Write a Design Memo, Develop the Idea, Know Your Audience, Build a Prototype, Write the Rules, Play Test, Simplify, and Publish.

Keywords: Emotion, Adolescent, Board Game

1 Introduction

Emotions are one of the conditions that affect human daily life. Emotions refer to special thoughts and feelings psychologically and biologically to take an action. Generally, emotion is a person's response to stimuli that originate in an individual from within and outside of himself [1].

Emotions in adolescents are very influential in the growth and development of each individual. Because in adolescence often have an unstable emotional level. This emotional instability can be caused by the family and the immediate environment of each individual [2]. Emotional instability can cause a teenager to find it difficult to know what emotions are being felt. Some people find it difficult to know what emotion they are actually feeling, but they name several emotions such as sadness, fear, anxiety, and depression to let them know that they is feeling bad for someone [3].

As a result of the difficulties of adolescents to know what emotions they are feeling, they make teenagers keep these emotions to themselves so that teenagers have the possibility of experiencing mental problems emotionally. This is supported by the results of WHO research states that 1 in 5 adolescents experience emotional mental problems due to ignorance of their emotions [4]. In fact, teenagers themselves already know these

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emotions, but because this understanding just appears in their stage, they cannot distinguish these emotions [5].

Based on the problems above, the introduction of emotional names **needs to be done in order to reduce the occurrence of emotional mental problems** in adolescents. The author chooses board game as an interactive medium for recognizing those emotions because one of the interactive media that is often used for learning is a board game. Game-based learning is used as a learning medium because it has a fun impression in the learning process [6]. Board games can also make teenagers socialize more and get to know their closest people.

2 Review of Literature

2.1 Emotion

The meaning of emotion is a feeling that is displayed or shown through psychological functions such as facial expressions, behavior, to a person's heartbeat [7]. Emotion is a feeling that is strong and comes from a mood, situation, or relationship with someone. Emotions have two classifications, namely the classification of positive emotions and the classification of negative emotions. Positive emotions include happiness, gratitude, trust, and others. Negative emotions include anger, disgust, guilt, and others.

Emotions are divided into eight basic emotions which include joy, trust, surprise, sadness, disgust, anger, and anticipation [8]. On the emotion wheel, it can be seen that each emotion has a relationship between one another, such as joy as opposed to sadness, trust and disgust to a combination of emotions between existing basic emotions such as love resulting from feelings of happiness and trust.

Beyond the eight basic emotions, there are many descriptions of them. [8] The description of these emotions is developed through ten basic benchmarks on the evolution of the emotions themselves. Some of the basic benchmarks that influence the evolution of emotions are humans or animals, life problems, history, prototype patterns, hypothesis construction, opponents, to their similarity and intensity.

2.2 Adolescent

The transition from childhood to adulthood is referred to as adolescence [9]. Adolescence itself is a transitional period in the lifespan that takes individuals from childhood to early adulthood [10]. Adolescence is divided into two stages: early adolescence, spanning from 13 to 17 years of age, and late adolescence, ranging from 17 to 18 years of age [11].

During adolescence, individuals experience emotional and labile states [12]. The impact of this crisis makes it challenging for teenagers to control themselves, particularly during early adolescence when they are undergoing a developmental transition from one stage, namely childhood, to adulthood [13].

The changes experienced by teenagers are closely related to social adjustment. During adolescence, they are required to socialize with individuals they have never met or

experienced outside of their family and school environments. Teenagers spend more time with their peers, and as a result, peers play a significant role in influencing attitudes, conversations, appearances, and behaviors, often more so than family members. For example, most teenagers are aware that wearing the same clothing as popular group members can increase their chances of being accepted as part of that group [11].

2.3 Board Game

Board games in general are games that are played on a board with interactions between players and components on the board. When the game starts, the material contained in the game board must first be prepared, such as dice, cards, or tokens that will be used later during the game. If the material has been prepared, the game is ready to start. When the game is underway, players will interact a lot with other players and with components on the game board by swapping, throwing dice, and working together [14]. There are three types of elements that include a board game or board game; Rules and Mechanic, Material and Graphic, and Theme [15].

3 Design Methods

3.1 Ideation

In the first stage, namely Ideation, the author writes and seeks information about the background of the topic to be raised, through reference research, interviews, focus group discussion, observation, reference studies, and existing studies.

The author collects data for designing board games using books and journals as references related to Design, Board Game, and Emotions. The insights found were what is board game, how to make a board game, what is emotion, and how emotion works on adolescent.

The second data collection carried out by the author was conducting interviews with Mr. Ariyanto Yanwar, M.Psi., as Child and Adult Clinical Psychologists, at this stage the author received information about emotions in general, the role of emotions in adolescents, the response of emotions in adolescents, understanding emotions in adolescents, recognition of emotions, and result of emotional ignorance in adolescents.

Focus Group Discussions were conducted by the authors as a way to collect data. FGDs were conducted with 8 children aged 10 to 18 years. The results of the FGDs conducted by the author are the extent to which adolescents' knowledge of emotions, experiences of anxiety caused by emotions, and opinions regarding the recognition of emotions.

The author made observations on YouTube videos uploaded by Adhicipta Play-ground to get information about board games. At this stage the author gets information about board game explanations in general, types of board games, advantages of board games, how to design a board game, and tips for making a board game interesting.

The author conducted a reference study using two board games, namely "When I Dream" and "Love Letter". used by "When I Dream". At this stage the author also pays attention to the advantages and disadvantages of the board game which is used as a

design reference study. The Existing Study conducted by the author is by using two Board Games, “DiXit” and “Feelinks”. At this stage, the author learns how to play the two board games, what kind of mechanics are used, then how to collect scores used, and also pays attention to the advantages and disadvantages of the board game.

3.2 Theme-driven vs Mechanic-driven

In the second stage, the author carried out three methods, namely making a Mind Map and Tone of Voice, determining a Big Idea, and making a Stylescape Mood board. In this process the author uses 8 colors as the core color, and 16 colors derived from the core color and 8 combined colors from the core color. The typeface used for Headlines is Futura Bold, while the font used for Body text is Avenir Book. The big idea that is obtained is "Identifying Emotional Regulation Through Reflection in a Safe and Non-Judgmental Space," which means that when connected to the creation of a board game, the board game will provide a non-judgmental environment for players to reflect on and regulate their emotions. While playing the board game, participants engage in a structured and interactive experience that allows them to explore various scenarios, make decisions, and experience different emotions in a safe and controlled environment.

This process encourages self-reflection and introspection as players navigate challenges, successes, and failures in the game. By creating a non-judgmental space, the board game provides an opportunity for individuals to identify their emotions, understand their triggers, and practice emotional regulation techniques in a supportive and accepting atmosphere. The connection between the creation of the board game and emotional regulation highlights the potential of board games as a good medium for facilitating emotional awareness in adolescent growth.



Fig. 1. “Mood Mess”’s Stylescape Mood Board

3.3 Card Games vs Board Games

At this stage, the author determines what kind of game design will be made. Where the author determines it is better for the game to only use cards, or there are other assets such as dice, tokens, points, and so on. So it is determined by the author where cards are needed as images to describe emotions, boards to place guess bets, tokens to guess and match emotions, and tokens to calculate emotional points.

3.4 Reality Check

After the game assets have been determined, the authors find that the game board is required for the board game to be played. The author determines the shape of the board used to play. Some of the options made by the author are flip-flops boards, 2:3 ratio boards with card decks, and square-sized boards. The design of the emotional board is also determined as hexagon or reverse-hexagon, until in the end the author decides to make a reverse-hexagon shaped board.

3.5 Write a Design Memo

At this stage, the author makes a game mechanism design when it is played. The game mechanism is made in a rough outline to know in outline how the game will work.

3.6 Develop the Idea

After determining the rule mechanism that will be used to play, the author determines how the game ends. The author makes a "Winning Condition" to end a game because to make a game, there must be a winner in a game.

3.7 Know Your Audience

At this stage, the author seeks to find out more about the intended target audience, by conducting deeper research regarding the target's behavior regarding board games. The research conducted by the author is to find out what type of board game the intended target audience is interested in, find out the prices of local board games and international board games, and find out the assets used in board games.

3.8 Build a Prototype

At this stage, the author made a rough first prototype by making pen and paper. Pen and paper is made using paper and a pen and only takes the form of a card. Pen and paper was created to try out what a running game is like

3.9 Write the Rules

At this stage the author finalizes the board game that was made so that it can be carried out a Play Test or Alpha Test at the next stage. At this stage the author creates the assets needed by board games such as:

Board Game

The game board made by the author is a circular game board with a dual-fold size of 40cm x 40cm because based on the results of the second prototype, a board measuring 20cm x 30cm is still not big enough for the game to be played. The circular board were

also inspired by Plutchik's wheel of emotion with the exact same emotions shown. The design of the game board is a reverse-dual-octagon shape, where there are 8 sides on the inside of the octagon, and there are 16 sides on the outside of the octagon. The colors and illustrations used on the emotion board are the same as the colors and illustrations on the Emotion Card.



Fig. 2. "Mood Mess"'s emotion board

Emotion Card

In making emotion cards, the author makes cards with a size of 5.7cm x 9cm, according to the size of US Game cards. The colors used on the emotion card are 32 different colors which are 8 core emotion colors taken from the color palette used, 16 derived colors from the core emotion colors, and 8 colors derived from a combination of two overlapping core emotion colors.

At the top of the emotion card there is also a square-shaped asset that has a dot in the middle, the number of dots on the emotion card describes how high the intensity of the emotion is. Overlapping complex emotions are symbolized by the two colors that cause these emotions to occur. The name of the emotion is written on the black block, and at the bottom of the name there is an explanation of the emotion. Illustrations are also used to describe the written emotion names.

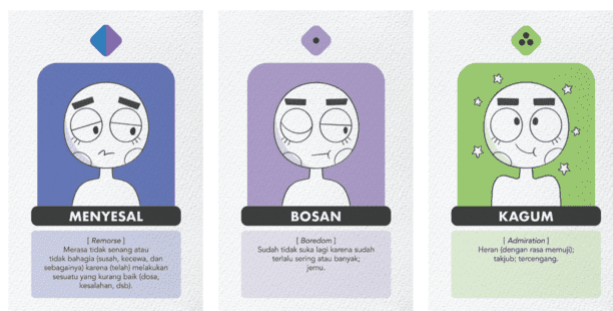


Fig. 3. "Mood Mess"'s emotion card

Role Card

Making role cards has the same layout as emotion cards, which has a size of 5.7cm x 9cm equivalent to US Game cards, and has the same position, namely illustrations, role names, and explanations of how these roles work. There are 8 role cards, with 1 The Mood and 7 The Mess. The color used on the role card is the same color as the color on the complex emotion card.

Game Tokens

In a game designed by the author, it requires two tokens to perform an action, the first is "Matching Token", where the token is a square with an "exclamation mark" in the middle indicates that the intended emotion is "Match!" or the same and has a function to equate emotions. The next token is the "Guessing Token", which is in the shape of a triangle and has a "question mark" in the middle indicates that this token is a question (like guessing something). The color used in all tokens is the same color as the color of the role card, that is, it uses the same color as the complex emotion card.

Emotion Points

On the emotional points used, the author chooses the octagon shape as the pattern of the emotional points. The octagon on the emotion points also represents the eight core emotions found on the emotion board. Emotion points in the game total 100 tokens, with 40 emotional tokens worth 1, and 20 tokens each for emotion points worth 3, 5, and 10. The purpose of making different points is so that players can have large points without having to have a lot of tokens.

The color used for emotion points is a monochrome color, with a whiter color the higher the points. This usage illustrates the same as the theory of a color wheel, if the color wheel rotates stably, the color will turn white, and if the color wheel rotates unsteadily, the resulting color will turn dark. It's the same as the color of the emotion points used, the higher the player can guess and match the emotions, the brighter the color that gets on the points.

Rules Sheet

On rules sheet the author using a modular grid, featuring an explanation of the game, components of the game, game mechanics, winning conditions of a game, and some tips when playing. In making regulations, the author uses A5 size using a single-column grid.

Emotion Card List Book

In the emotion card list book, the author uses the same size as the size on the rules sheet, namely A5. The contents of the emotion card list book are all the components of the emotion card. The function of having a list of emotion card books is so players can see a list of pictures on the emotion cards in the game.

3.10 Play Test

At this stage, the author conducts a Play Test or Alpha Test to determine whether the objectives of the board game have been conveyed. The Alpha test was conducted by 46 users, consisting of 13 males and 33 females aged 18-22 years. The duration of the game is approximately 2-5 minutes per one emotion card to be described and guessed, which means to complete 1 game round with 32 cards it will take at least 64-160 minutes.

The results of the Alpha test conducted by the author yielded several user feedback. The feedback from the Alpha test will be analyzed and used to improve the game, making it more visually appealing, enhancing its content, and increasing its interactivity to make the designed game more perfect.

Table 1. Results about “Mood Mess”

Question	Mean	Score (%)
The font size (typeface) on the board game is designed to be easily readable	4,71	89,13%
The components of the board game (cards, board, tokens, game pieces, etc.) are designed to be easily distinguishable from one another	4,56	91,30%
The information on the rule sheet is designed to be easily understood	4,45	89,13%
The game mechanics are clear and well-defined	4,69	93,91%
The scoring system in the board game is clear and well-defined	4,60	92,17%
The information regarding Game Notes on the rule sheet helps facilitate the smooth progression of the game	4,47	89,56%
The information explaining emotions on the Emotion Cards is easily understandable	4,71	94,34%
The Emotion Cards and Role Cards are easily distinguishable from each other	4,60	92,17%
The Emotion Card reference book assists throughout the game	4,67	93,47%
The board game is easy to understand and play	4,60	92,17%
There are numerous interactions between players during the board game	4,63	92,60%

During gameplay, I feel curious about the board game	4,78	95,65%
I feel thrilled while playing the board game	4,78	95,65%

The results obtained from the alpha test conducted indicate that the majority of users say that the visuals of the board game "Mood Mess" are good. However, the author found that the font size in the emotion explanations is difficult to read for some users. The font size in the emotion explanations should also be enlarged and given spacing from the English emotion names and their explanations.

The author also found that some players find it difficult to distinguish between the emotion cards and the role cards at first glance. They have to carefully examine them to differentiate between the role cards and the emotion cards.

Criticisms and suggestions received by the author is the illustrations used to depict emotions are also not descriptive enough for some users. Means that the illustrations should be made more expressive or exaggerated to better depict an emotion.

In the end the analysis reveals that the board game is easy to understand and play, and there are many interactions among players during the game. Players also feel curious and enjoy themselves throughout the game.

3.11 Simplify

At this stage the author makes improvements to the work based on the results obtained during the Play Test or Alpha Test. the improvements made by the author are as follows:

Illustration of Emotion Card

The illustrations on the emotion cards were changed because some of the illustrations on the cards did not sufficiently depict those emotions. The expressions on some of the cards were still too flat, so there was a need for changes in several emotion cards.

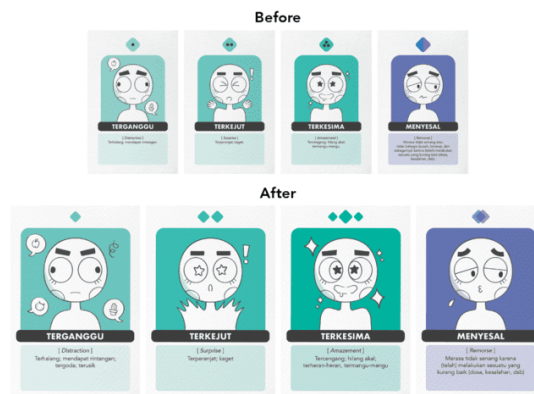


Fig. 4. Mood Mess's Improved Emotion Card

Emotion Card Size

The size of the emotion card was changed from 5.7cm x 9cm to 8cm x 12 cm. This size change was made because there was input during the play test where the typeface on the emotion description on the emotion card was too small.

Role Card Size

Changes were also made to role cards, from 5.7cm x 9cm to 6.35cm x 6.35cm or the equivalent of 2.5". This change was made because there is the same explanation on the role card and regulatory paper or it is called redundant. This change was also made so that role cards and emotion cards are easy to distinguish.



Fig. 5. "Mood Mess"'s Improved role Card

Token Thickness

Token thickness (matching tokens, guessing tokens, and emotional points) changed because they are often difficult to pick up when playing. The change in token thickness from 0.5mm to 2mm was made so that when playing, players are more comfortable taking actions and scoring.

Thickness and Form of the Board

The thickness of the board has also changed because there is an input that if the board is too thin, the game media will be prone to damage. The author changed the size of the board from 0.5mm to 2mm. The shape of the board was also changed from a circle

(dual-fold) to a square (quad-fold). The change in the shape of the board was made to save storage space.

Rules Sheet Size

The size of the rules sheet was changed from A5 to a square measuring 20cm x 20cm. This change was made so that when storing game assets, it would be neater and more organized. In this change the author also added from one visual asset for each component to all board game visual assets.

Emotion Card List Book Size

The size of the emotion card list book was changed from A5 to a square measuring 20cm x 20cm. This change was the same as the change in the size of the regulation paper, namely so that when storing game assets, it would be tidier and more organized.

Emotion intensity level icon on Emotion Card

Changing the icon The level of emotional intensity on the emotion card has changed because some groups when playing did not find information about the icon, even the contrast on the icon was still lacking so that some players often ignored the icon. The author made changes to the icon which was in the form of a dot in a square to become a square in number with the intensity of his emotions.



Fig. 6. "Mood Mess"'s Improved Emotion Intensity Level Icon

Box Design for Board Game

Not only making improvement on the assets, the author also creating box design for the board game. The creation of this box is measuring 21.3cm x 21.3cm x 5.3 cm for the top of the box and 20.8cm x 20.8cm x 5.15 cm for the bottom of the box. The design contain triangle that represent prism but also represent the board game, the white light represents the user, and the color means the emotion. The design of the box means that when the user playing this board game, they can identify the emotion.

3.12 Publish

At this stage, the board game design is completed and ready to be published, and results of the design can be played with a predetermined target audience. However, this published board game cannot be bought or sold yet because it is a final project work.



Fig. 7. “Mood Mess”’s Final Product Mockups

At this stage, the author also preparing the budget required for the production of the "Mood Mess" board game and its supporting elements. The calculations performed by the author include the production costs of the board game and the production costs of the supporting elements. Here is the breakdown of the budget required for the mass production of the "Mood Mess" board game with 500 units in rupiah:

Table 2. “Mood Mess” Production Cost

Items	Quantity	Unit Price	Subtotal
Emotion Cards (80mm x 120mm) 32 Cards / 4 = 8 A4 sheets	4000	10.500	42.000.000
Role Cards (63.5mm x 63.5mm) 8 Cards / 12 = 1 A4 sheet	500	10.500	5.250.000
Rule Sheet (200mm x 200mm) 1 A4 sheet	500	10.500	5.250.000
Booklet (200mm x 200mm) 12 pages / 4 = 3 A3 sheets	1500	10.500	15.750.000
Emotion Board (400mm x 400mm) 4 A4 panels	2000	21.000	42.000.000

Game Tokens 100 hexagon, 8 triangles, 8 squares	500	50.000	25.000.000
Telescoping Box (204mm x 204mm x 50mm)	500	100.000	50.000.000
-			
Total			185.250.000
Net/pack			370.500

4 Conclusion

Overall, emotions play a significant role in the daily lives of adolescents. Recognizing and understanding emotions is crucial, especially during adolescence when emotional instability is common. Difficulty in identifying and expressing emotions can lead to mental and emotional challenges for teenagers. Introducing and teaching teenagers about the names and explanations of emotions is crucial in enhancing their emotional knowledge.

Introducing emotions through board games yields positive outcomes, such as increased imagination, motivation, and understanding of their emotions. The introduction of emotions through board games helps individuals to relate to the feelings of other players, as they may encounter emotions that they have never experienced before.

Playing board games provides a conducive setting to introduce emotions to teenagers. During gameplay, a non-judgmental atmosphere is fostered, allowing teenagers to reflect on themselves and delve into their emotions. This concept is in line with the overarching idea of "Identifying Emotional Regulation Through Reflection in a Safe and Non-judgemental Space."

This demonstrates that using board games as an interactive medium to introduce emotions can help teenagers enhance their understanding of emotions and develop their ability to manage them, reducing the likelihood of unidentified mental and emotional issues. It is important for teenagers, families, and society to support this approach in order to enhance emotional knowledge in teenagers and support their development.

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