
Design of the 'LAPPY' Card Game as an Educational Medium for Daily Activities to Limit Screen Time in Children Aged 9-12 Years

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Abstract

Screen time is a common activity in today's digital era, such as when children engage in online learning, play games, or use social media anything that involves screens. This study aims to help children understand and manage their daily activities in a balanced manner while becoming aware of appropriate limits for screen use. Using the design thinking method with stages of empathize, define, ideate, prototype, and test, this research resulted in a card game titled "LAPPY", which focuses on managing daily activities up to a total of 24 hours through a mechanism of completing mandatory cards and calculating earned time points. Designed primarily for children aged 9-12 years, the game helps them recall their screen time duration and organize their daily activities more effectively. Testing involved media experts (94%), material experts, teachers (94.6%), material experts, doctors (98.6%), the general public (91%), and children (95%), showing that the game is suitable as an educational medium and an enjoyable learning tool. Therefore, the "LAPPY" card game can support children in developing habits of managing their daily activities from an early age while reminding them of appropriate screen time limits within a day.

1. Introduction

The rapid development of technology in Indonesia has brought various innovations such as smartphones, digital wallets, televisions, tablets, and computers. These devices have become an essential part of daily activities, supporting not only work and shopping but also children's learning processes. However, this technological advancement has also led to challenges, especially for children who are increasingly exposed to screens at an early age.

Most parents allow their children aged 9-12 years to use digital devices independently. Studies have shown that unsupervised screen use can negatively affect children's health, increase stress, and cause emotional imbalance (Rizki Fauzan et al., 2021). Several reports from Indonesia reveal alarming data: many elementary school students experience eye disorders, sleep problems, or learning difficulties due to excessive gadget use (Kartika Hentty & Oktavia Happy, 2023). Research findings also indicate that children spend an average of 3-7 hours daily on digital devices, exceeding the recommended screen time limit of 1-2 hours per day (Kompas.com, 2020). This condition highlights the importance of parental roles in managing children's daily activities to

maintain a balance between digital and non-digital engagement. According to UNICEF (2023), 95% of children aged 9-12 in Indonesia access the internet at least twice a day, which increases the risk of exposure to harmful online content. Parents, therefore, need practical and educational tools to guide children in managing time effectively while reducing dependency on screens.

One promising alternative is the use of educational boards or card games. Card games are flexible, simple, and can be played anywhere without digital devices. Beyond entertainment, they enhance children's social, strategic, and cognitive skills. Previous research (-Banar et al., n.d.) supports that card games can serve as an alternative learning medium, helping children shift their attention from gadgets while learning through play.

The purpose of this study is to design an educational card game that helps children aged 9-12 years understand the importance of balancing daily activities. The motivation behind this research arises from the increasing gadget addiction among children and the need for interactive learning tools that encourage healthy habits. The method involves designing and testing a card game prototype focusing on daily activity balance. The expected finding is that this game can serve as an effective learning medium to educate children about time management and reduce excessive screen exposure.

1.1 Literature Review

Several previous studies have explored the design of educational card games as interactive learning media for children. These studies provide theoretical and practical insights into how card games can effectively deliver educational content while maintaining engagement and enjoyment.

(Kartini, 2024) The "MITKIT" card game teaches children aged 9-10 about disaster mitigation and preparedness in a fun way. Like "LAPPY", this game uses cards as an interactive learning tool, but its focus is on disaster prevention rather than balancing daily activities. (Mauludi Amin et al., n.d.) designed a card game about online gaming habits to teach time management, unlike "LAPPY", which promotes an overall balance between digital and offline activities. The card game "Tanda Elok" (Studi, n.d.) teaches "tajwid" using augmented reality to increase engagement, focusing on Islamic reading rules rather than time management. (Dan & Noviriesca, n.d.) created a game about "unggah-ungguh" (Javanese etiquette) for children aged 4-6 years, emphasizing moral and language education rather than time management. (Ricky Kristanto et al., n.d.) developed a card game about types of plastic to raise environmental awareness, similar to "LAPPY" in method but different in theme.

In summary, previous studies have shown that educational card games are effective in supporting children's learning and behavior. However, few have focused on helping children balance their daily activities and limit their use of gadgets. The "LAPPY" project fills this gap by providing time-based interactive games that teach children aged 9-12 to manage their days effectively through interactive learning.

2. Research Methods

Quoting from Gilbert et al. (2018), Design Thinking developed by Stanford d.school is an innovative, user-centered approach to problem solving. It emphasizes understanding user needs to generate relevant and applicable solutions. This study applies the five stages of Design Thinking: Empathize, Define, Ideate, Prototype, and Test.

Empathize

This stage aims to understand the problem of excessive screen time among children aged 9-12 years in Malang City. Data were collected through three techniques:

- Interviews
Conducted with parents and a general practitioner. The results indicate that excessive gadget use causes emotional instability, low responsiveness, sleep disorders, and speech delay. Parents are especially concerned about exposure to inappropriate content.

- **Observation**
Children typically spend long periods watching YouTube and playing online games after school and at night, indicating high daily screen exposure.
- **Literature Study**
Previous studies report that excessive screen time negatively affects concentration and academic performance (Rizki Fauzan et al., 2021). WHO (2020) recommends screen time for children aged 9–12 should not exceed 2 hours per day. Educational card games are considered effective media for improving motivation and learning engagement.

Define

The problem was analyzed using the 5W+1H approach. The findings indicate that screen time among children has increased significantly since the pandemic due to easy gadget access and limited parental supervision. Therefore, an educational medium is needed to help children manage daily activities and screen time effectively.

Ideate

Based on the identified problem, the proposed solution is the design of an educational card game called “LAPPY”, which aims to teach children about balanced daily activities.

Main ideas:

- LAPPY functions as an educational card game to manage screen time.
- The game contains hidden educational messages about time management.
- The target users are children aged 9–12, parents, and elementary school teachers.
- The product can be distributed through bookstores and toy stores.

Prototype

The LAPPY card game is designed to help children arrange daily activities within a 24-hour structure. The name “LAPPY” is derived from Laplace’s philosophy that present actions influence future outcomes, simplified to sound child-friendly.

Target Audience

- **Demographic:** Children aged 9–12 in Malang
- **Psychographic:** Parents and adults concerned with children's development
- **Behavioral:** Families seeking alternative educational media

Game Design

- **Media:** Print
- **Card size:** 6 × 9 cm
- **Total cards include activity categories such as:**
- Screen time (2 hours / trap 4 hours)
- Education
- Creative activities
- Household activities
- Sports
- Play
- Rest
- Worship

All activities were selected based on their positive impact on children’s cognitive, social, and emotional development.

Gameplay Design

The game adopts hand management and set collection mechanics. Players must arrange activity cards to reach exactly 24 hours, including four mandatory cards:

- Sleep
- School
- Worship
- Screen time (max 2 hours)

The first player who successfully completes a balanced 24-hour activity set is declared the winner.

Layout and Visual Design

Sketches were created as the initial visual guide for developing the digital version of the cards. These sketches help determine the placement of visual elements such as icons, titles, duration, and activity categories.

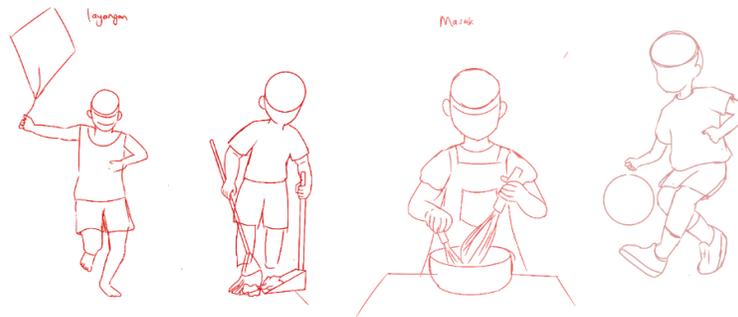


Fig. 1 Character sketch

The game features two main characters (male and female) representing elementary school children to strengthen visual storytelling and help users relate to the activities illustrated on the cards.

Card Digitization Example

At the digitization stage, the card designs were finalized into visual assets representing daily activities. The cards are divided into mandatory cards and optional cards to support flexibility in gameplay while maintaining the educational objective.

Mandatory Cards

Mandatory cards represent essential daily activities that must be included to complete the 24-hour arrangement.

Sleep Card

Sleep cards have two duration options: 8 hours and 10 hours. These durations are based on international health recommendations, which state that adequate sleep is essential for brain development, emotional regulation, and immune function in children (NSF, 2015; AASM, 2016).



Fig. 2 Example of sleep card design

School Card

The school card has a duration of 6 hours, following national and international standards (Ministry of Education and Culture, 2018; UNESCO, 2016; OECD, 2021). This activity supports children’s intellectual, social, and disciplinary development.

Screen Time Card

The screen time card is limited to 2 hours in accordance with WHO (2019) recommendations for children aged 9–12 years. A 4-hour version is designed as a trap card that exceeds the recommended limit and cannot be used to complete the 24-hour target, functioning as a game distraction element.

Worship Card

The worship card has a duration of 1 hour and is categorized as mandatory because it contributes to character building, emotional balance, and discipline (Ministry of Education and Culture, 2017).

Optional Cards

Optional cards are designed to provide flexibility and variety in gameplay while still supporting balanced child development.

- Educational Activities: homework, studying
- Creative Activities: painting, music, origami
- Play Activities: kite flying, congklak, engklek
- Household Activities: sweeping, washing dishes, shopping, cooking

These activities were selected because they support cognitive, social, emotional, and motor development, while also serving as alternatives to excessive screen use.

3. Result and Discussion

3.1 Discussion

The main issue identified in this study is the lack of awareness among children and parents regarding the importance of limiting screen time, which has gradually become a daily habit and resulted in an unbalanced routine dominated by a single activity.

To address this problem, the researcher designed an educational card game titled “LAPPY”, which teaches children about time management and appropriate screen time limits through interactive gameplay. The game requires players to arrange daily activities into a balanced 24-hour schedule, indirectly training counting skills, logical thinking, and self-awareness of time use.

With colorful illustrations and simple mechanics based on hand management and set collection, the game promotes interaction, critical thinking, and social communication. Therefore, LAPPY can be utilized as an educational medium for families, schools, and communities.

3.2 Results

The LAPPY card game was developed as a physical educational medium featuring a simple layout, bright colors, and cartoon-style illustrations to attract children and reduce dependence on digital devices. Each card represents a daily activity and contains time-based points, allowing children to practice basic numeracy while learning balanced routines.

The cards were printed on 260 gsm art paper, with a 6 × 9 cm size and rounded corners to ensure durability and safety. Several trial sessions were conducted to ensure that the design, rules, and educational objectives were clearly understood by elementary school-aged children.

A. Media Expert Evaluation

Media expert validation was conducted by Istvano, a game designer from Let’s Play Indonesia, during a playtest session at MCC Malang. The results are presented in Table 1.

Table 1. Media Expert Assessment Results

No	Evaluation	Skor				
		1	2	3	4	5
Media Aspect						
1	Clarity of card packaging				✓	
2	Card design/UI					✓
3	Card mechanics				✓	
4	Card size					✓
5	Print image quality and paper quality					✓
Aspects of Attractiveness						
6	Illustrations support content and are easy to understand					✓
7	Font and color selection					✓
8	Character suitability					✓
9	Game flow is easy for children to understand				✓	
10	Clarity of game objectives and benefits					✓
11	Interactivity between players (communication, healthy competition)				✓	

No	Evaluation	Skor				
		1	2	3	4	5
12	Game flow is easy for children to understand				✓	
13	Durability of card media for repeated use					✓
14	Daily activity materials are appropriate for children's needs					✓
15	Educational values are conveyed (time management, screen time)					✓
16	Language used is appropriate for the target age group					✓
17	Game design and concept spark curiosity				✓	
18	Card size and shape are suitable for children's hands					✓
19	Are educational values conveyed without sounding patronizing?					✓
20	Does this game have the potential to be used as a learning tool at home or school?					✓

Based on 20 assessment items:

Very Good (VG): 14 items (70%)

Good (G): 6 items (30%)

No negative ratings

The average score was 4.7 out of 5, resulting in a final score of 94%, categorized as Very Good.



Fig. 3 Media expert test (source: author's documentation)

These results indicate that the LAPPY card game has strong potential as an educational learning medium.

B. Material Expert Evaluation

1. Subject Matter Expert (Elementary School Teacher)

Validation was conducted by Mrs. Wiwik Hismawati, teacher at SDN 1 Karangbesuki.

Results:

- Number of items: 15
- Very Good: 11 (73.3%)
- Good: 4 (26.7%)
- Average score: 4.73
- Final result: 94.6% (Very Good)

This shows that the content is highly suitable for elementary school students.

2. Health Expert (Medical Doctor)

Material validation was also conducted by Dr. Emmi Wijayanti, a general practitioner experienced in child health.

Results:

- Very Good: 14 items
- Good: 1 item
- Average score: 4.93
- Final result: 98.6% (Very Good)

The expert stated that the game is highly relevant for educating children about healthy screen habits and expressed interest in using the cards.



Fig. 4 Subject matter expert trials (source: author's documentation)

C. Public Respondent Trial

The game was tested on 44 respondents from the general public. The detailed results are shown in Table 3.

Table 2. Results of general respondent assessment

No	Assesment	Skor				
		1	2	3	4	5
1	Have you ever played a card game before?	3		39		2
2	Do you understand the concept of the Lappy card game?		2	2	4	36
3	Is the theme of this game relevant to the habits of children today?		6		2	36
4	Do you think this card game can teach children to manage their daily activities?		2	1	6	35
5	Do you think this card game can help reduce gadget usage?		4		7	33
6	Are the characters and color tones used attractive to children aged 10+?			1	4	39
7	Is the packaging design compact enough to carry around?			2		42
8	What do you think of the UI/card design in this game?			3	4	37
9	What do you think of the UI color palette on these cards? Is it appropriate for children aged 10+?	2		3	3	36
10	What do you think of the font on these cards? Is it appropriate for children aged 10+?		1		39	4
11	Are the icons and descriptions on the Activity cards easy to understand?	3	2		7	32

No	Assesment	Skor				
		1	2	3	4	5
12	Are the rules of the game easy to understand?	1	1		4	38
13	Is this game fun and interactive?		5	6		33
14	If you were playing as a child, would you want to play this game more than once?	3	4	4		33
15	Are the game mechanics simple enough for children aged 10+?			5	34	5
16	If you are a parent or educator, would you be willing to play or recommend this game to children?				5	39

Summary results:

- Total responses: 704
- Strongly Agree: 513 (72.87%)
- Agree: 100
- Somewhat Agree: 62
- Negative responses: only 4.12%

The average score was 4.55, with a final result of 91%, categorized as Very Good.



Fig. 5 Adult respondents (source: author's documentation)

D. Children Trial Results

The game was tested on 33 children from SDN 1 Karangbesuki and Kemantren Village.

Results:

- Total responses: 330
- Strongly Agree: 303
- Agree: 27
- No negative responses
- Average score: 4.91
- Final result: 98.2% (Very Good)

These findings indicate that children were highly engaged, responsive, and enthusiastic while playing.



Fig. 6 Documentation of village children in Kemantren & students at SDN 1 Karangbesuki (source: author's documentation)

4. Conclusions

In this final project report, the author has designed a card game called “LAPPY”, primarily intended for children aged 9–12 years. Based on the results of research and testing, this game is designed with the concept of balancing daily activities as a learning tool to help children understand the importance of daily routines and manage their screen time duration. In this game, children are challenged to arrange their daily activities within 24 hours by completing four main mandatory activity cards. The design of the game incorporates cartoon-style illustrations of daily activities, simple and easy-to-understand game mechanics, and competitive elements. The testing results show that the “LAPPY” card game received positive responses from children, teachers, parents, and professionals, such as doctors. The game was also deemed appropriate by experts in game design and visual communication as an alternative learning medium. Therefore, the “LAPPY” card game can serve as an effective and enjoyable educational tool with game rules that are easy for children to understand. Writing an academic article is a challenging but very fulfilling endeavor. Hopefully, the guidelines presented here will enable you to write your first academic article with relative ease. Students, however, often underestimate the time required to produce a “polished” first effort. You cannot write a proper research article in a weekend or even a week. It is, therefore, extremely important to allow yourself enough time –at least three to four weeks to work on the successive draft.

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