Safenet Journey: Building Teenager's Resilience Against Cyber Grooming Through Innovative Game-Based Learning

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Abstract. Low digital literacy and a lack of understanding regarding cyber grooming prevention make students more vulnerable to this crime. This study aims to develop an educational tool called "SafeNet Journey," designed as an educational board game to prevent cyber grooming among students in Malang City. The SafeNet Journey board game enhances students' understanding and awareness of cyber grooming through educational gameplay tailored to the characteristics of middle school students. Thus, the novelty of this study lies in the use of an educational snakes-and-ladders-style board game that integrates cyber grooming prevention education into interactive learning, thereby strengthening students' understanding of digital safety. This study employed the Research and Development (R&D) method using the ADDIE model, which encompasses Analysis, Design, Development, Implementation, and Evaluation. Based on the results of validation tests conducted by media experts and content experts, the suitability rating for the SafeNet Journey board game reached 91.25%, placing it in the "Highly Suitable" category. Meanwhile, the suitability rating for the cyber grooming content presented in the board game reached 90%, placing it in the "Highly Suitable" category. These results indicate that SafeNet Journey is suitable for use as a learning tool in efforts to prevent cyber grooming among junior high school students in Malang City.
Keywords: Cyber grooming; SafeNet Journey board game; Digital literacy; Students.

1. Introduction

Technology and communication are advancing rapidly and bringing about significant changes to people's lives. By 2025, the number of internet users in Indonesia is projected to reach 229.4 million, with the younger generation or Gen Z making up the majority (R. Sari, 2025). The growing prevalence of digital activities poses the risk of a type of cybercrime known as cyber grooming. According to data released by the Indonesian National Police, there were 236 cases of child cyber grooming in 2019–2020, while in 2025 there was a significant increase to 300 cases; however, only about 50% of these cases were resolved due to challenges in the investigative process (Holivia & Sutarman, 2021). CATAHU has noted that the most frequently reported forms of violence are sexual violence and psychological violence, each accounting for 26.94% of cases (Komnas Perempuan, 2025). These data indicate that cyber grooming constitutes a form of online sexual violence with the potential to cause psychological harm to victims. Consequently, effective preventive measures are needed to minimize the occurrence of cyber grooming in educational settings.

Civic awareness and digital literacy play a crucial role in helping students understand, prevent, and respond to the threat of cyber grooming. Cyber grooming is the act of approaching minors with the intent of persuading them to engage in sexual activities via digital media as desired by the perpetrator (Andaru & Imara, 2021). Meanwhile, according to Syabilla (2024), cyber grooming is an approach taken by an adult toward a minor with the aim of satisfying the perpetrator's biological desires. Raising students' awareness and understanding requires an educational and contextual learning approach tailored to their needs. Therefore, to support this objective, an educational medium is needed that can help students deepen their understanding of cyber grooming namely, an educational board game. An educational board game is a type of game that uses a board as its primary medium of play (Najib, 2018). Through case simulations and decision-making, educational board games can serve as a learning tool to help students understand cyber grooming and strengthen their civic values.

A review of the literature from previous studies indicates that the research focused on educational aspects, specifically the role of peers (Rakhmawati & Yuliejatiningsih, 2023). In addition, Ishmah, Ramadhana, Sicillia, Arimbawa, & Putri (2024) highlighted regulatory aspects regarding applicable legal policies, regulatory limitations, and the government's response to the phenomenon of cyber grooming. The novelty of this study lies in the innovative media developed to help students understand cyber grooming using the ADDIE model. Previous research on the use of educational board games has incorporated digital citizenship material focused on the phenomenon of cyber grooming; thus, this study not only offers new content but is also relevant to the learning characteristics required by junior high school students.

Based on this previous research, it appears that efforts to prevent cyber grooming have focused more on educational approaches and regulatory studies, while the development of interactive learning materials tailored to

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the characteristics of junior high school students remains very limited. This study introduces an innovation through "SafeNet Journey," an educational snakes-and-ladders-style board game that integrates cyber grooming prevention material into interactive learning to enhance students' civic awareness and digital safety literacy. Therefore, this study aims to develop and test the effectiveness of the SafeNet Journey board game as a learning medium in cyber grooming prevention efforts for junior high school students in Malang City.

2. Research Methods

This study employs a Research and Development (R&D) approach using the ADDIE development model to create game-based learning media as an educational tool on cyber grooming for junior high school students. The study involved several junior high schools in Malang City selected using a random sampling technique, namely Malang Public Junior High School No. 5, Malang Public Junior High School No. 6, and Malang Public Junior High School No. 24. In general, the ADDIE model consists of five main stages: analysis, design, development, implementation, and evaluation. This model provides an organized framework for design, development, and evaluation, making it widely used as a guideline for producing a viable, engaging, and effective product (Tegeh, Jampel, & Pudjawan, 2014). This study was limited to the development stage; thus, the activities conducted included needs analysis, product design and development, and expert validation. During the analysis stage, the researcher identified the needs and characteristics of junior high school students as the basis for developing educational materials and media to prevent cyber grooming. Subsequently, the researcher formulated a set of indicators to assess the suitability of the developed product. During the design phase, the researchers designed the concept, components, and games, and developed the research instruments. During the development phase, the researchers transformed the conceptual design into a physical prototype, validated the product, and revised it based on feedback from validators.

Research data is categorized into quantitative and qualitative data. Quantitative data was obtained through validation forms filled out by subject matter experts and media experts to assess the product's suitability in terms of content and media. The instrument used was a Likert scale with five rating categories: very poor, poor, adequate, good, and very good. Meanwhile, qualitative data is obtained through suggestions and feedback from validators as a basis for product refinement. Quantitative data is analyzed using descriptive analysis techniques in the form of suitability percentage rates, while qualitative data is analyzed descriptively through a process of data reduction, presentation, and drawing conclusions to support improvements to the developed product.

3. Results and Discussion

3.1 Analysis

The analysis phase began with a needs assessment through a literature review on the phenomenon of cyber grooming, the characteristics of junior high school students, and learning needs at the junior high school level. The results of the analysis showed that students have limited ability to recognize the forms, signs, and preventive measures for cyber grooming. This situation is influenced by the nature of cyber grooming, which occurs covertly through interactions in digital spaces, making it difficult to detect early on. Cyber grooming is described as a manipulative process that begins with building a relationship and emotional attachment through compliments and attention, eventually leading to the exploitation of the victim (Amilda, Sutari, Audi, Hafizhah, & Rosmalinda, 2025). Furthermore, interview results with teachers indicate that there are currently no educational materials specifically designed to educate students about cyber grooming. Therefore, an approach is needed that can provide a contextual, enjoyable learning experience tailored to students' characteristics.

Based on the results of the needs analysis, a game-based learning approach was chosen as an alternative to address students' need for understanding cyber grooming. The game-based learning approach was chosen because it integrates play with the delivery of content, allowing students to learn through experience, discussion, and decision-making in situations that resemble real-life conditions (Wibawa, Mumtaziah, Sholaihah, & Hikmawan, 2021). Based on these considerations, the game-based learning tool SafeNet Journey was developed to help students recognize forms of cyber grooming, understand warning signs, and determine the appropriate actions to take when facing risky situations in the digital space.

3.2 Design

The design phase involved developing a preliminary design for the cyber grooming educational board game and validation instruments. All components of the board game were designed in an integrated manner so that gameplay would support the achievement of the learning objectives: for students to be able to recognize forms of cyber grooming, understand warning signs, and determine the appropriate actions to take when facing risky situations in the digital space. The initial design of the educational cyber grooming board game was created using the Canva app to facilitate the visual design process and the integration of each component, including the game board, game cards, and a leaflet containing material on cyber grooming. The game board was designed by adapting

the concept of the classic “Snakes and Ladders” game, modified by adding case scenario squares, information code squares, and warning code squares.

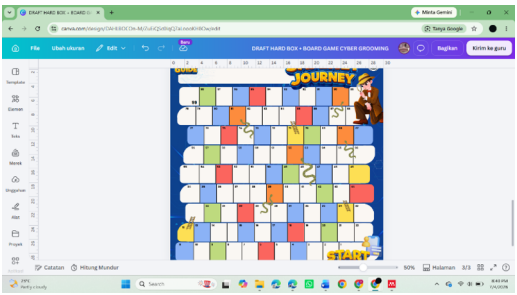


Fig 1. SafeNet Journey Prototype, Author’s own work (2026)

In addition, there are game cards and leaflets designed as supporting components integrated with the game board. The game cards were developed to represent the case scenario tiles through the presentation of case studies, answer keys, and reflective questions, while the leaflets were designed to represent the codes found on the information and warning tiles. Furthermore, the validation instrument was developed in the form of a Likert-scale questionnaire used by validators to assess the product’s suitability in terms of content and media.

3.3 Development

The development phase involved turning the completed design into a ready-to-use SafeNet Journey board game. The development process included refining the visual design, incorporating content on cyber grooming into each game component, printing the product, and conducting expert validation tests. The final product consists of a game board, game cards, a leaflet, game pieces, and dice, all designed as an integrated SafeNet Journey board game.

3.3.1 Description of the SafeNet Journey Board Game

This study produced a game-based educational tool called SafeNet Journey. The development of the SafeNet Journey board game aims to help students understand the forms of cyber grooming, recognize its signs and risks, and determine the appropriate steps to take when facing situations that could undermine their digital resilience. These abilities are an important part of digital resilience, the ability to adapt and persevere in any situation in the digital space (I. Sari et al., 2026). The development of this educational tool adopts a board game mechanism by integrating educational content about cyber grooming into a snakes and ladders game. The Snakes and Ladders game was chosen because it is familiar to all age groups, making the basic rules easy to understand and implement in a school setting.

A game-based learning approach allows students to learn through hands-on experience, interaction, and simulations of real-world situations, making the concepts being taught easier to understand (Widiana, 2022). This approach also encourages students to develop higher-order thinking skills to analyze problems and consider the consequences of a decision (Fajrin & Hasanuddin, 2026). Through this approach, the SafeNet Journey board game is expected to encourage student engagement in developing problem-solving strategies, critical thinking, and making wise decisions when facing situations that pose a risk of cyber grooming.

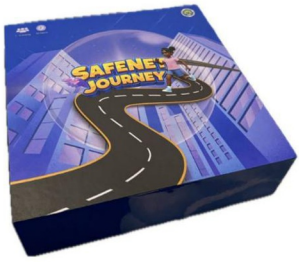


Fig 2. SafeNet Journey Box, Compiled by the author (2026)

The SafeNet Journey board game consists of several integrated components designed to provide an interactive and enjoyable learning experience. The main components of the SafeNet Journey board game are the game board, cards, a leaflet, game pieces, and dice. The innovation of this medium lies in the design of the game board, which features a digital world theme complete with social media icons, digital devices, and digital security symbols. Like a typical snakes and ladders game, the SafeNet Journey board game consists of 99 squares that players must traverse from the starting point to the finish line. All squares on this board game are designed with varied concepts to distinguish the function of each square, including scenario squares, information code squares, and warning code squares that represent students' digital experiences. These scenarios align with the concept of contextual learning that is, learning based on real-world problems and practical problem-solving activities. Contextual learning is considered capable of enhancing students' conceptual understanding, enthusiasm for learning, and emotional experiences, thereby balancing cognitive and affective aspects (Hayati, Karim, Kartika, & Fachrurazi, 2025). These three types of squares are designed to complement one another in building a holistic learning experience.

The case scenario section serves as a contextual learning tool that presents various situations that could potentially lead to cyber grooming. This approach allows students to connect the concepts they have learned with their everyday experiences, thereby helping them develop analytical and critical thinking skills in making decisions in various situations, including those in the digital space (Sugiansyah, Solari, Adhim, & Suyuti, 2025). Information code tiles serve as a medium for reinforcing concepts by linking game activities to the cyber grooming educational material in the leaflet. Meanwhile, warning code tiles serve as reminders of various digital behaviors that could potentially endanger personal safety in the digital space. Both types of tiles are designed to encourage students to explore the material independently through the leaflet. Through this approach, the learning process takes place not only through play but also through feedback that helps reinforce students' understanding (Febrian & Sani, 2023). By integrating these three types of tiles, the game board functions not only as a game component but also as a learning strategy that presents information, case analyses, and reflections to strengthen students' understanding of cyber grooming prevention.

In addition, this medium retains the functions of the snake and ladder icons as part of the game's mechanics. The ladder icon represents safe behavior in the digital world, allowing players to advance to a higher square. Conversely, the snake icon depicts risky behavior or decisions that increase the potential of becoming a victim of cyber grooming, forcing players to return to the previous square. These icons serve not only as visual elements but also facilitate conceptual understanding by providing visual representations that stimulate students' imaginations, making abstract concepts more concrete and easier to remember (Nkosinkulu, 2024). Thus, the snake and ladder icons not only enhance the visual presentation but also serve as a learning tool that helps students understand the relationship between digital behavior and its consequences. This gaming experience is expected to improve students' understanding and awareness of how to stay safe while interacting in digital spaces.



Fig 3. SafeNet Journey Game Board, Compiled by the author (2026)

The SafeNet Journey board game also includes 20 game cards that integrate various scenarios from the digital world into the gameplay. Each card contains a case study representing digital experiences relevant to teenagers' lives, such as interactions with strangers on social media, requests for personal information, and other forms of communication that could potentially lead to cyber grooming. In addition, each card comes with answer keys and reflection questions to guide the discussion and evaluation process. During the game, students are asked to analyze the cases and answer the reflection questions both individually and in group discussions. This approach aims to train students to make decisions and determine the appropriate actions when facing similar situations in the digital space.



Fig 4. SafeNet Journey Card, Compiled by the author (2026)

In addition, there is a leaflet that serves as a supplementary information source on cyber grooming. The material is designed in the form of codes that serve different educational functions, namely: a. "Did You Know" to provide basic knowledge; b. "Alert" to raise awareness of the signs of cyber grooming; c. "SC" (Safe Choice) to provide examples of safe digital behavior; and d. "RF" (Red Flag) to help students recognize behaviors that could potentially endanger their personal safety in the digital space. This information is presented concisely in bullet points, combining text, icons, and illustrations themed around the digital world to make it easy for students to understand.



Fig 5. SafeNet Journey Leaflet, Compiled by the author (2026)

3.3.2 Game Mechanics of the Board Game "SafeNet Journey"

The gameplay mechanics of SafeNet Journey are designed based on the principle of "learning by playing." "Learning by playing" guides students toward learning through purposeful, play-based activities. As explained by Smith and Pellegrini, "learning by playing" does not emphasize the final outcome, but rather an enjoyable and flexible learning process (Yunarti, Harmaningsih, & Wijayanti, 2023). The game begins with each player placing their token on the Start space, then moving according to the roll of the die to the next space until reaching the Finish space. Players take turns rolling the die and performing activities corresponding to the type of space they land on. When landing on a case scenario space, the player draws one game card, then reads and discusses the presented situation with group members. Next, students answer the questions on the card and share their reflections. After all group members have expressed their opinions, the teacher and students compare their answers with the answer key provided on the card as a form of feedback on the discussion. The teacher acts as a facilitator who guides the discussion, provides clarification when there are differences of opinion, and reinforces key

concepts related to cyber grooming. Through this process, students have the opportunity to analyze problems, discuss them, and make decisions based on situations that resemble real-life experiences.

When a player lands on an information code square, they observe the code displayed on the square and match it with the codes found in the leaflet. Next, the player reads the information corresponding to the code's category: Did You Know, Alert, SC (Safe Choice), or RF (Red Flag). Through this mechanism, the SafeNet Journey board game provides a learning experience that combines play, case analysis, information gathering, discussion, and reflection into a single learning sequence. This process is expected to help students build an understanding of cyber grooming, improve their critical thinking and decision-making skills, and foster awareness of safe behavior when interacting in digital spaces.

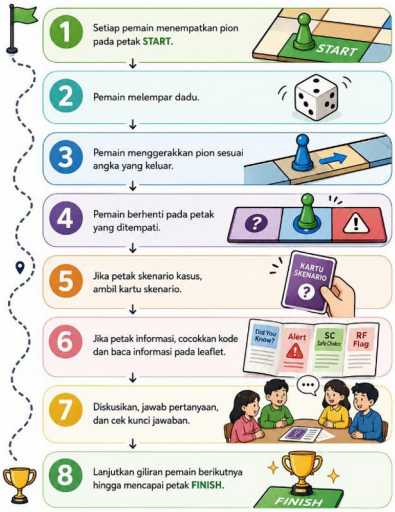


Fig 6. Game Mechanics of the Board Game "SafeNet Journey", Compiled by the author (2026)

3.3.3 Validation Results

The suitability of the SafeNet Journey board game was determined based on the results of validation tests conducted by media experts and subject matter experts. These two aspects have different suitability indicators to ensure the validity of each aspect. Media suitability indicators include 1. Visual presentation and design; 2. Physical quality and components; 3. Typography and readability; 4. Usability; and 5. Appeal and motivation to learn. Meanwhile, content suitability indicators include 1. Quality of content; 2. Alignment with learning objectives; 3. Language; and 4. Educational value and impact.

Table 1. Media Validation Results

No	Suitability Indicators	Score Obtained
1	Appearance and Visual Design	18
2	Physical Quality and Components	19
3	Typography and Readability	11
4	Usability	13
5	Appeal and Motivation to Learn	12
	Total Score Obtained (Σx)	73
	Maximum Total Score (Σxi)	80
	Percentage of Score ((Σx / Σxi) × 100%)	91,25%
	Feasibility Category	Highly Feasible

4.

Table 2. Material Validation Results

No	Suitability Indicators	Score Obtained
1	Content Quality	18
2	Alignment with Learning Objectives	16

3	Language Use	13
4	Usefulness and Educational Impact	26
	Total Score Obtained (Σx)	7
	Maximum Total Score (Σxi)	80
	Percentage of Score ((Σx / Σxi) × 100%)	90%
	Feasibility Category	Highly Feasible

Overall, the media suitability rating for the SafeNet Journey board game reached 91.25%, placing it in the "Highly Suitable" category. The SafeNet Journey board game features visually appealing graphics that are relevant to students' digital activities. The game's combination of colors, fonts, and layout is well-balanced, thereby supporting its media suitability. Additionally, the physical components of the board game are printed on durable, damage-resistant material that is easy to carry and features high-resolution graphics. Meanwhile, the suitability rating for the cyber grooming content presented in the board game reached 90%, placing it in the "Highly Suitable" category. The cyber grooming content is presented accurately and contextually, covering general definitions, forms, warning signs, and the impacts of cyber grooming. Furthermore, the game includes case scenarios and reflective questions that illustrate the phenomenon of cyber grooming. These components are expected to strengthen students' understanding of cyber grooming prevention, support the development of digital resilience, and help students make appropriate decisions when faced with situations that pose a risk of cyber grooming

5. Conclusion and Recommendation

This study successfully developed an educational medium in the form of the SafeNet Journey board game using the ADDIE development model. Based on the results of validation tests conducted by media experts and subject matter experts, the feasibility rating of the SafeNet Journey board game reached 91.25%, placing it in the "Highly Feasible" category. Meanwhile, the feasibility rating of the cyber grooming content presented in the board game reached 90%, placing it in the "Highly Feasible" category. The "SafeNet Journey" board game was developed effectively and engagingly, successfully conveying messages about cyber grooming prevention and raising students' awareness of the dangers of cyber grooming. The implementation of this game-based learning medium in junior high schools in Malang City is expected to contribute to improving students' understanding of the risks of cyber grooming, prevention methods, and strengthening their digital safety literacy.

The research findings indicate that this educational tool is suitable for implementation in digital literacy instruction in schools. It is therefore hoped that teachers will be able to utilize the SafeNet Journey board game to enhance students' understanding of and awareness regarding the dangers of cyber grooming. Further development is needed, particularly in terms of game variations and instructional materials, to ensure the tool is more comprehensive and effective as a learning resource. In addition, the effectiveness of this resource needs to be tested on a larger scale to determine the overall success rate of SafeNet Journey.

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