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Designing Educational Media to Promote Clean Living Habits among Kindergarten Children through Illustrated Books "Lumi dan Taman yang Bersih"

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Abstract:
Clean and healthy living habits are essential behaviors that should be instilled from early childhood. However, in practice, kindergarten children often demonstrate inconsistency in applying clean living behaviors, such as handwashing, maintaining personal hygiene, and caring for their surrounding environment. This issue is influenced not only by children's limited understanding but also by the lack of engaging educational media that align with their developmental stages. This study aims to design an illustrated book as an educational medium for promoting clean and healthy living habits among kindergarten children using a Design Thinking approach. The research methods include observation, interviews with teachers, questionnaires distributed to teachers and parents, and prototype testing. The design process follows the five stages of Design Thinking: empathize, define, ideate, prototype, and test. The results indicate that the illustrated book "Lumi dan Taman yang Bersih" was positively received and demonstrated potential to support children's understanding of clean living concepts. The designed illustrated book is expected to serve as an effective educational medium that supports the consistent practice of clean and healthy living habits both in school and home environments.

Introduction

Clean living habits constitute a fundamental aspect of early childhood character development that significantly influences children's physical, emotional, and social well-being. The phenomenon of low awareness of personal hygiene among children in various early childhood education institutions remains a prevalent issue. Many children are observed to be reluctant to clean their hands or feet after playing, lack discipline in disposing of waste properly, or pay insufficient attention to the cleanliness of their nails and clothing. Evidence from early childhood settings highlights the need for ongoing support for clean and healthy living practices at home and in educational environments (Anhusadar & Islamiyah, 2020).

Early childhood learners need to be trained repeatedly and in an enjoyable manner so that clean habits can be naturally internalized (Safitri & Harun, 2020). This phenomenon is not solely caused by a lack of knowledge, but also by learning processes that have not yet been able to instill hygiene values in ways that are engaging and effective for children. These conditions highlight the importance of identifying learning media capable of conveying moral messages and positive habits through visual and narrative experiences. At the preschool stage, children undergo rapid cognitive and emotional development, during which visual and symbolic experiences play a crucial role in shaping behavior and moral understanding (Santrock et al., 2021). Young children learn primarily by observing, imitating, and implementing behaviors in concrete ways.

Therefore, visually engaging learning media, such as illustrated books, have considerable potential in fostering clean living habits. Such media not only function as a means of delivering moral messages but also help children understand the meaning of clean behaviors through characters and stories that resonate with their world. Studies of illustrated learning materials emphasize the suitability of contextual illustrations for early childhood character education and the potential of picture books to stimulate children's creativity (Gilang et al., 2017; Billa et al., 2023). In early childhood education, picture storybooks may also support social-cognitive engagement by presenting recognizable emotions, characters, and different perspectives (Gusmayanti & Ayriza, 2023).

Suryana (2021) provides a general pedagogical framework for early childhood learning. More specifically, Nur Dhaahiru et al. (2021) investigated the design and evaluation of an illustrated book introducing healthy living to kindergarten children. Pramudita and Linggardini (2023) examined illustrated storybook media for hand-hygiene knowledge and skills among primary-school children, a different age group from the participants in this design study. Together, these sources support the relevance of educational storybooks but do not establish the effectiveness of the proposed integrated fable narrative for both personal and environmental cleanliness. This provides an opportunity to address four specific design considerations. First, handwashing-focused media do not necessarily encompass environmental hygiene. Second, the connection between visual expression, emotional narration, and the explanation of hygiene-related consequences warrants explicit attention. Third, the content should be adapted to the developmental characteristics of the participating kindergarten children; field observations and teacher interviews suggested that illustrated characters could provide accessible behavioral examples. Fourth, Design Thinking was selected as an iterative, user-centered framework for responding to the needs of children, teachers, and parents.

Based on these conditions, there is a need for educational media that not only deliver instructional content but also provide learning experiences that are visual, enjoyable, and developmentally appropriate for early childhood learners. Accordingly, this study aims to design an illustrated book as an educational medium for promoting clean living habits among kindergarten children, employing a Design Thinking approach to produce a work that is relevant, engaging, and effective in fostering clean living habits from an early age.

Unlike previous studies that focus on specific hygiene behaviors such as handwashing or toothbrushing, this study integrates environmental hygiene within a holistic narrative framework. Furthermore, the application of Design Thinking ensures that the illustrated book is developed through a user-centered and iterative process, contributing a structured visual communication design approach to early childhood hygiene education.

Methods

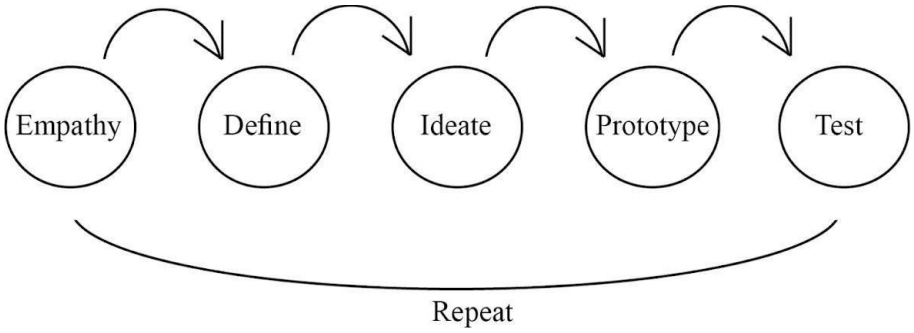


Figure 1. Design Methodology
Source: www.innovationtraining.org

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The design method employed in this study is grounded in a Research and Development (R&D) approach using the Design Thinking research model, which emphasizes a creative, iterative, and user-centered design process. R&D is particularly suitable for studies that aim not only to generate theoretical insights but also to produce tangible design outputs that can be tested and refined. In this research, the R&D approach enables the systematic development of an educational illustrated book while allowing continuous evaluation and improvement based on user feedback, ensuring that the final product meets the needs of its intended audience, namely kindergarten children.

Design Thinking is widely recognized as a problem-solving framework that places users at the center of the design process. According to Brown (2009), this method prioritizes empathy as a foundational element, encouraging designers to deeply understand users' experiences, needs, and challenges before proposing solutions. In the context of this study, empathy plays a crucial role in understanding the cognitive, emotional, and behavioral characteristics of early childhood learners. By adopting Design Thinking, the research is able to integrate emotional engagement, visual appeal, and functional effectiveness in a holistic manner, which is essential for developing educational media that are not only informative but also enjoyable and meaningful for children.

This approach is considered highly appropriate for the design of illustrated books for children because it supports the alignment of educational objectives with child-friendly visual and narrative elements. Design Thinking facilitates the exploration of ideas through iterative stages, allowing concepts to be tested, evaluated, and refined based on real user responses. The stages of the Design Thinking method applied in this study consist of five phases, which structure the entire design process from problem identification to testing and refinement. Through these stages, the research ensures that the illustrated book is developed systematically, grounded in user needs, and validated through practical implementation. The five-stage Design Thinking sequence and its iterative structure are illustrated in Figure 1.

Empathize

At this stage, the researcher conducted direct observations and interviews with the school principal and kindergarten teachers, as well as systematic observations of kindergarten children's behavior within the school environment. These activities aimed to obtain a comprehensive understanding of children's daily behaviors and the clean living habits practiced by early childhood learners. The observation results indicated that children within this age range frequently exhibited behaviors reflecting a lack of concern for personal and environmental cleanliness. Several habits identified included failing to clean their hands and feet after outdoor play, forgetting to wash their hands before meals, and paying insufficient attention to nail hygiene and the neatness of their clothing. These findings suggest that children's awareness and understanding of the importance of clean living habits still require improvement. Therefore, the results of the observations and interviews served as a foundational consideration in formulating the need for educational media that are engaging, easy to understand, and aligned with the cognitive and behavioral developmental characteristics of kindergarten children. An example of the kindergarten field-observation setting is documented in Figure 2.

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Figure 2. Field Observation at a Kindergarten School
Source: Author's Documentation

Define

Based on the data collection results, it was identified that kindergarten children require learning media that are not only informative but also capable of fostering clean living habits in an enjoyable and engaging manner. Observations and supporting data indicated that conventional instructional approaches, which tend to rely heavily on verbal explanations or direct commands, are often less effective for children at this developmental stage. Children learn more optimally when educational messages are delivered through media that stimulate their curiosity, imagination, and emotional involvement, thereby enabling the internalization of values related to personal and environmental cleanliness in a more natural way.

In response to these findings, illustrated books were selected as the most appropriate educational medium due to their strong visual and narrative qualities. The combination of images and storytelling allows abstract concepts, such as hygiene and cleanliness, to be presented in a concrete and relatable form. Visual narratives have been shown to influence children's emotions and behaviors by providing examples that can be observed, interpreted, and imitated. Gusmayanti and Ayriza (2023) discuss the potential of picture storybooks to support theory-of-mind development, a relevant consideration when designing expressive characters and narratives that present different emotional perspectives.

Accordingly, the primary problem formulated in this study focuses on how to design an educational illustrated book that is capable of cultivating children's awareness of the importance of maintaining personal and environmental cleanliness. This problem formulation emphasizes the need to align the content, visual style, and narrative structure of the book with the developmental characteristics of kindergarten children. The design is expected not only to convey information but also to encourage positive behavioral change by presenting cleanliness values in a persuasive, child-friendly, and contextually relevant manner.

Ideate

At the ideate stage, the development process focused on formulating visual and narrative concepts that closely align with the world of kindergarten children. This stage began with the creation of a moodboard, which served as a conceptual guide to define the overall atmosphere, color palette, visual references, and emotional tone of the illustrated book. The moodboard helped ensure consistency between visual elements and the intended educational message, while also reflecting themes that are familiar, engaging, and appealing to young children. Through this process, the design

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direction emphasized a playful, warm, and friendly aesthetic to support positive learning experiences. The moodboard that informed the visual direction of the book is presented in Figure 3.

The main idea developed at this stage was the introduction of a primary character in the form of a cute and cheerful kitten that reflects the behaviors and emotional expressions commonly found in kindergarten children. The choice of an animal character was intended to foster emotional attachment and identification, allowing children to relate to the character without feeling instructed or pressured. The storyline was designed to be light, playful, and easy to follow, supported by a colorful visual style that illustrates daily hygiene-related activities such as handwashing, toothbrushing, maintaining personal cleanliness, and disposing of waste properly. These activities were deliberately presented as part of the character's everyday life to help children perceive clean living behaviors as normal and enjoyable routines.

During the ideation stage, the primary challenge involved determining the balance between educational content and narrative enjoyment. Initial concept drafts were considered too instructional, reducing the emotional engagement of the story. Revisions were made to embed hygiene messages more implicitly within the storyline.

In addition to the main illustrated book, the ideation process was expanded to include the development of supporting media aimed at reinforcing hygiene messages beyond the reading experience. Supporting items such as lunch boxes, tumblers, bookmarks, and stickers featuring the same main character were conceptualized to extend the presence of the narrative into children's daily activities. The use of consistent characters and visuals across multiple media was intended to strengthen message retention and recall, while also increasing children's engagement with clean and healthy living behaviors in various contexts. This integrated approach supports the repetition and reinforcement of hygiene values in a subtle yet effective manner.



Figure 3. Moodboard Source: Pinterest

Prototype

At the prototype stage, the development process focused on translating conceptual ideas into a tangible and functional illustrated book design. This stage began with the formulation of the storyline and storyboard, which served as the narrative and visual framework for the book. The storyline was

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structured to ensure a clear and logical flow of events, while the storyboard guided the sequencing of illustrations in alignment with the narrative. In parallel, character illustrations were developed with careful consideration of form, expression, and proportion to ensure that the characters were visually appealing, easily recognizable, and appropriate for the developmental characteristics of kindergarten children. The resulting set of character designs is presented in Figure 4.

In addition to narrative and character development, this stage involved the selection of color schemes and typography that supported both aesthetic quality and functional readability. Color palettes were chosen to be bright and engaging, yet balanced, in order to attract children's attention without overwhelming their visual perception. Typography selection emphasized legibility and child-friendly letterforms, ensuring that the text could be easily followed by early readers or understood when read aloud by teachers and parents. These elements were then integrated into the overall book layout, where the arrangement of text and illustrations was designed to create visual harmony and facilitate a smooth reading experience.

The prototype stage also included the production of a dummy or physical book model, which functioned as an initial representation of the final product. This dummy was used to evaluate the visual appeal, layout consistency, and readability of the story content from the perspective of kindergarten children. Preliminary testing was subsequently conducted with teachers and children at partner kindergartens to gather direct feedback on the prototype. The insights obtained from this early evaluation process served as the basis for further refinement, ensuring that the illustrated book met educational objectives while remaining engaging, accessible, and developmentally appropriate.

In the prototype phase, several minor design issues emerged. Some children experienced difficulty understanding specific vocabulary used in dialogue sections. As a result, sentence structures were simplified and adjusted to better match early childhood language comprehension levels. Additionally, spacing between text and illustrations was increased to improve readability. An example of the illustration-production process is shown in Figure 5.



Figure 4. Character Illustration Source: Created by the author

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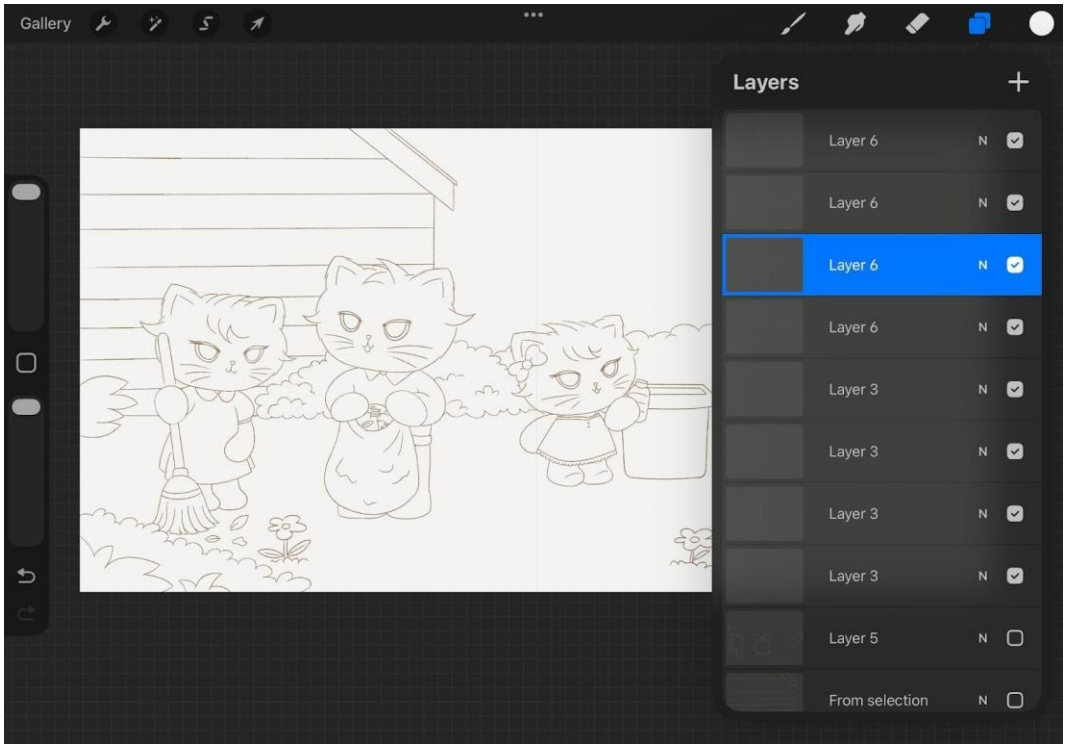


Figure 5. Illustration production process Source: Created by the author

Testing and Evaluation

At the test stage, trials were conducted to assess the extent to which the illustrated book was accepted by children and whether the hygiene messages were effectively conveyed. Teachers and parents were asked to provide feedback regarding the language, visual elements, and children's responses to the book's content. The evaluation results served as the basis for refining the design and developing the supporting media. This testing process contributed to data validation by ensuring that the designed educational media functioned as intended and were appropriate for kindergarten children.

Participants

The beta testing phase involved 26 kindergarten children (aged 5–6 years) from Class B2 at TK Al-Islam 5 Surakarta. The class originally consisted of 32 students; however, 26 children participated in the testing process. Two classroom teachers participated as expert validators during the alpha testing phase.

Data Collection

Data were collected through observation, interviews with teachers, and questionnaire-based evaluation during the testing phase. A simplified Likert-scale questionnaire (scale 1–5) was used to assess five indicators: visual attractiveness, character appeal, narrative clarity, message comprehension, and relevance to daily hygiene practices. Teacher validation (alpha test) assessed content appropriateness, curriculum alignment, language simplicity, visual–text balance, and classroom implementation feasibility.

Data Analysis

Quantitative data from the Likert-scale questionnaire were analyzed descriptively by calculating the mean score of each indicator and the overall average score. The results were interpreted using the following criteria:

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1. 4–5 = Very Good
2. 3–4 = Good
3. 2–3 = Fair
4. 1–2 = Poor

During beta testing, it was observed that some children required verbal guidance from teachers to interpret certain cause-and-effect sequences related to hygiene consequences. This indicated that while visual engagement was strong, abstract reasoning still required adult facilitation. These findings informed minor refinements before finalizing the product.

Result and Discussion

Alpha Test Result

Teacher validation results indicated high feasibility across content appropriateness, curriculum alignment, visual–text balance, and classroom implementation aspects. Minor revisions included simplifying selected vocabulary and improving text spacing for readability. The ratings for each teacher-validation aspect are summarized in Table 1.

Table 1. Alpa Test Result Source: Created by the author

Assessment Aspect	Mean Score	Category
Content Appropriateness	5	Very Good
Language Simplicity	4	Good
Curriculum Alignment	5	Very Good
Visual–Text Balance	5	Very Good
Implementation Feasibility	5	Very Good
Overall Mean Score	5	Very Good

The teacher validation results show a very high perceived feasibility level (Mean = 5), indicating strong acceptance of the illustrated book as a classroom-supporting educational medium. The discussion section shows how the author interprets the results in light of what was already known, and to explain the new understanding of the problem after taking your results into consideration. The discussion must connect with the Introduction, so it tells how your study contributes to the body of knowledge and society. As shown in Table 1, language simplicity received a lower rating than the other four validation aspects.

Parent Validation Result

Parents reported strong child engagement and relevance to daily hygiene routines. The book was perceived as supportive in reinforcing clean living values at home. The parent-validation scores for the five assessed aspects are presented in Table 2.

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Table 2. Parent Validation Result Source: Created by the author

Assessment Aspect	Mean Score	Category
Child's Interest During Reading	5	Very Good
Clarity of Hygiene Message	5	Very Good
Educational Value	5	Very Good
Relevance to Daily Hygiene Practices	5	Very Good
Ease of Understanding with Parental Aid	5	Very Good
Overall Mean Score	5	Very Good

Based on the parent validation results, the illustrated book received a high overall mean score of 5, categorized as "Very Good." Parents reported that children demonstrated strong interest during reading sessions and were able to recognize hygiene-related behaviors presented in the story. The book was perceived as educationally valuable and relevant to daily routines at home. Slightly lower scores on independent understanding indicate that parental guidance still plays a supportive role in reinforcing message comprehension. Table 2 shows that all five parent-validation aspects received a score of 5.

Beta Test Result

Children demonstrated positive emotional responses and were able to identify hygiene-related behaviors presented in the illustrations. However, interpretation of cause-and-effect relationships required teacher facilitation. The indicator-level results of the beta test are presented in Table 3.

Table 3. Beta Test Result Source: Created by the author

Indicator	Mean Score	Category
Visual Attractiveness	5	Very Good
Character Appeal	5	Very Good
Narrative Clarity	5	Very Good
Message Comprehension	4	Good
Relevance to Daily Hygiene	4	Good
Overall Mean Score	5	Very Good

The overall mean score of 5 indicates that the illustrated book was perceived as highly appropriate and engaging for kindergarten children. The highest rating was obtained for visual attractiveness, while message comprehension and relevance to daily hygiene practices received slightly lower yet positive scores, indicating areas for further refinement. As detailed in Table 3, message comprehension and relevance to daily hygiene practices received lower scores than the other three indicators.

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Design Challenges

During ideation, early drafts were considered overly instructional, requiring narrative refinement to improve emotional engagement. In the prototype phase, layout spacing and vocabulary adjustments were implemented based on testing feedback.

Study Limitation

The evaluation focused on perceived engagement and short-term comprehension. No longitudinal behavioral tracking or experimental pre-test/post-test measurement was conducted. Therefore, findings reflect perceived appropriateness rather than confirmed behavioral transformation.

Results of the Design

This design resulted in an educational illustrated book aimed at instilling clean living habits in kindergarten children. The illustrated book was developed as a visual learning medium that presents a fable-based narrative using animal characters as representations of children's everyday behaviors. The concept of the illustrated book adopts a fable storytelling approach combined with a pastel color palette to create a soft and playful impression. Fable stories were selected because animal characters can represent human actions and offer an indirect way to introduce character values, a rationale discussed in early childhood fable literature and illustrated fable design (Juanda, 2019; Prasetyo, 2014). The visual treatment and storyline were designed to align language, character illustrations, and age-appropriate learning experiences, consistent with prior analyses of picture-book design for young children (Gilang et al., 2017; Billa et al., 2023). The final product consists of a front cover, back cover, and content pages that are visually and narratively integrated. The completed front and back covers are shown in Figure 6.



Figure 6. Front cover and back cover of the book Source: Created by the author

The front cover of the book was designed as the primary visual element intended to capture children's attention while simultaneously providing a concise representation of the story's content. This section features the book title rendered in child-friendly typography, accompanied by an illustration of the main character, a small kitten named Lumi. The character Lumi is depicted with a cheerful expression and simple forms to create a friendly impression that is easily recognizable by kindergarten children. In addition, a background illustration portraying environmental settings and hygiene-related activities, such as tidying up and maintaining cleanliness, is included to provide an initial visual cue regarding the theme of clean living habits presented in the book.

The design of the front cover is not solely oriented toward aesthetic considerations but also takes into account its communicative and psychological functions for children as the target audience. The cover serves as a curiosity trigger that encourages children to open and explore the book's content. The use of bright colors, simple visual compositions, and a strong focus on the main character is intended to create strong visual appeal without causing visual overload. In this way, the front cover functions as a narrative gateway that helps children build initial expectations regarding the story and the educational values conveyed.

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Meanwhile, the back cover was designed with an informative function primarily aimed at parents and teachers as learning facilitators for children. This section presents a brief synopsis that summarizes the storyline and highlights the main educational messages related to clean living habits. The inclusion of this synopsis assists parents and teachers in understanding the intended learning objectives of the illustrated book prior to its use in reading activities or classroom instruction. Through a clear division of functions between the front and back covers, the overall cover design supports not only the visual and narrative experience for children but also reinforces the role of the book as a well-planned educational medium that is practical and accessible within early childhood education contexts.



Figure 7. Sample Content of the book Source: Created by the author

The content of this illustrated book centers on the main character, a kitten named Lumi, who lives with Mama and Papa in a house with a playground garden. The narrative is structured in a linear and simple manner to ensure it is easily understood by preschool-aged children. The story begins with Lumi's daily routine upon waking up and noticing the untidy condition of the house, particularly the dining table covered with leftover food. The conflict emerges when Lumi's friends invite him to play in the garden but are reluctant to continue playing because the environment is dirty and littered with trash. Their refusal causes Lumi to feel sad and leads him to realize that environmental cleanliness directly affects shared comfort and enjoyment. Representative illustrated scenes from this narrative are presented in Figure 7.

The climax of the story occurs when Lumi and his family experience stomachaches. Through a scene set in a clinic, a doctor explains in simple terms that flies originating from garbage can carry germs that cause illness. This information is conveyed through imaginative visuals to help children understand the cause-and-effect relationship between waste and health.

In the concluding part of the story, Lumi, together with Mama and Papa, participates in a collective effort to clean the garden and begins sorting waste into different types of trash bins. The story ends with a clean garden and the return of Lumi's friends to play and have a picnic together. This conclusion reinforces the moral message that maintaining environmental cleanliness has positive impacts on health and shared happiness.

The illustrated book employs bright colors, a simple illustration style, and a top-down layout to ensure that information is easy for kindergarten children to follow. The KG Primary Penmanship typeface was selected due to its rounded, bold, and soft letterforms, which convey a cute, friendly,

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and personal impression for children. Overall, the visual style of the book is designed to be child-friendly, communicative, and educational, enabling hygiene messages to be conveyed in an accessible and enjoyable manner.

Discussion

The discussion in this study is structured to examine the relationship between the problem of low clean living habits among kindergarten children and the visual communication design solution proposed. The discussion begins with a presentation of the results of problem identification in the field, obtained through observations and supporting data collection, in order to provide a factual overview of the clean living behaviors of early childhood learners. Subsequently, the discussion focuses on the conceptual and practical considerations underlying the selection of illustrated books as educational media that are considered relevant to children's cognitive, visual, and emotional developmental characteristics. In the final part, the discussion emphasizes the role and function of illustrated books as a design solution capable of effectively conveying hygiene messages through a communicative and persuasive visual and narrative approach that aligns with children's imaginative world, thereby supporting the formation and sustained habituation of clean living behaviors. The design stages and supporting visuals are documented in Figures 1–5, while the completed book is illustrated in Figures 6–7. The teacher, parent, and child assessments reported in Tables 1–3 indicate positive immediate responses, but they do not demonstrate sustained changes in hygiene behavior.

The Problem of Clean Living Habits in Early Childhood

Clean and healthy living habits constitute one of the fundamental aspects of healthy behavior formation that should ideally be instilled from early childhood. At this stage, children are in an early developmental phase that plays a crucial role in shaping long-term behavioral patterns. Hand hygiene is an important component of infection prevention, including in schools and child-care settings (World Health Organization & United Nations Children's Fund, 2020). Research on early childhood environmental education also highlights the potential of school-based activities to reinforce clean and healthy living practices (Sastradiharja, 2024). Therefore, education on clean and healthy living habits in early childhood should not be regarded as a supplementary component, but rather as an integral part of the educational process.

Personal and environmental hygiene are important components of clean and healthy living behavior. Consistent hygiene practices can help reduce exposure to preventable health risks, while repeated routines provide opportunities to develop individual and shared responsibility. The Indonesian national guidance on clean and healthy living behavior establishes a policy framework for promoting these practices across everyday settings (Kementerian Kesehatan Republik Indonesia, 2011).

However, the results of field observations and questionnaires distributed to teachers and parents indicate that some kindergarten children have not yet demonstrated consistency in practicing clean and healthy living habits. Simple behaviors such as proper handwashing, maintaining body cleanliness, and disposing of waste in designated places are still frequently neglected. This inconsistency suggests that children's understanding of cleanliness has not been fully internalized as part of their daily routines.

These findings indicate that the process of internalizing cleanliness values among early childhood learners has not yet been optimally achieved. Children often perceive cleanliness merely as a rule to be followed at school rather than as a personal need that holds meaningful implications for their own health. This condition illustrates the distinction between knowing about cleanliness and practicing it consistently; research on early childhood clean and healthy living behavior likewise emphasizes implementation in daily contexts (Anhusadar & Islamiyah, 2020).

The low level of clean and healthy living practices among young children is influenced by various factors, one of which is habituation patterns within the family environment. Parents play a central role

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as behavioral role models for children; therefore, parental practices related to personal and environmental hygiene are likely to be imitated by their children. A lack of role modeling and inconsistent habituation at home can weaken the formation of clean living habits in early childhood (Anhusadar & Islamiyah, 2020; Suyanto, 2015).

Furthermore, inconsistency between habituation practices applied at home and those implemented at school further undermines the process of behavior formation. Children require consistent behavioral reinforcement across different environments for habits to be firmly established. When cleanliness values are emphasized only at school without adequate reinforcement at home, the habituation process becomes less effective and tends to be temporary in nature (Safitri & Harun, 2020).

In addition to family-related factors, limitations in learning media that align with the developmental characteristics of early childhood also represent a significant issue. Hygiene education in schools still largely relies on verbal and instructive methods, such as oral explanations or direct commands. This approach tends to be less effective, as young children have limited attention spans and require concrete learning experiences that are visually engaging.

From a cognitive perspective, early childhood learners are at the preoperational stage, in which thinking processes are still concrete and symbolic. Children experience difficulties in understanding abstract concepts, including those related to cleanliness and health, when they are not supported by visualizations and narratives that are closely aligned with their imaginative world. Consequently, the delivery of hygiene-related messages in abstract forms without visual support may reduce children's comprehension and information retention (Santrock et al., 2021).

This condition indicates that approaches to hygiene education must be adapted to the developmental characteristics of early childhood learners. Children learn most effectively through observing, imitating, and directly experiencing activities. Communicative, narrative, and contextual visual media can serve as a bridge between hygiene-related messages and children's concrete experiences, thereby facilitating a deeper understanding of the meaning behind clean and healthy behaviors (Arsyad, 2019).

Based on these considerations, it can be concluded that the low level of clean and healthy living habits among early childhood learners is not solely attributable to individual factors, but also to educational approaches that are not yet fully aligned with children's developmental needs. Therefore, more creative, communicative, and visually oriented learning strategies are required to support the internalization of cleanliness values. Such approaches are expected to foster clean and healthy living habits more effectively and sustainably from an early age, both in school and home environments.

Illustrated Books as Visual Educational Media for Clean and Healthy Living Habits

Educational illustrated books are designed as one of the visual learning media solutions to address the issue of low levels of clean and healthy living habits among early childhood learners. The selection of illustrated books is based on their ability to simultaneously integrate visual and narrative elements, allowing educational messages to be delivered more effectively, engagingly, and in a manner that is easily understood by children. Story-based visual media enable children to learn not only through text but also through concrete and contextual visual observation (Arsyad, 2019; Sudjana & Rivai, 2017).

At the kindergarten level, children tend to learn through visual experiences and stories that are closely related to their daily lives. Early childhood learners demonstrate a high dependence on visual stimuli to support their understanding of concepts and the meaning of specific behaviors. Therefore, illustrated books are highly relevant to children's cognitive and affective developmental characteristics, as they present information in a symbolic, concrete, and imaginative form within a single integrated medium (Santrock et al., 2021).

The fable storytelling approach is employed in this illustrated book as a persuasive and contextual strategy for delivering hygiene-related messages. Fables allow cleanliness values to be

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embedded within narratives that align with children's world without creating an instructive or didactic impression. Children do not perceive the content as direct instruction; instead, they are invited to enjoy an engaging story, enabling hygiene messages to be received more naturally (Nurgiyantoro, 2018).

The use of animal characters as representations of human behavior constitutes one of the key strengths of fables in early childhood education. Animal characters are imaginative, expressive, and easily memorable for children, thereby increasing emotional engagement and attention during the reading process. Through story characters and their actions, fables can communicate character values in an indirect, age-appropriate manner (Juanda, 2019; Prasetyo, 2014).

From a learning perspective, the delivery of cleanliness values through illustrated books based on fable narratives falls within the framework of implicit learning. In this approach, children are not explicitly instructed to perform certain actions; rather, they are guided to understand and model behaviors through reading experiences and visual observation. Implicit learning is considered more appropriate for early childhood learners, as it respects the gradual process of value internalization in line with their developmental stage (Nurgiyantoro, 2018).

Illustrated fables can present actions and their consequences through character-centered scenes, giving children opportunities to discuss choices and values in an accessible narrative format (Prasetyo, 2014). In this design, the consequences of untidy surroundings are introduced through Lumi's experience rather than through direct commands.

From a visual design perspective, the illustrations in this book are developed by considering both educational objectives and the visual characteristics of children as the target audience. Educationally, illustrations function to represent clean and healthy living behaviors concretely, such as handwashing, maintaining personal hygiene, and disposing of waste properly. Clear and communicative visuals assist children in recognizing appropriate actions and relating them to everyday situations (Arsyad, 2019).

From the children's perspective, the use of bright colors, simple shapes, and uncomplicated visual compositions is adapted to the visual and cognitive developmental stages of early childhood learners. Bright colors attract children's attention and create a pleasant learning atmosphere, while simple illustration forms facilitate object and character recognition. This approach aligns with theories of children's visual development, which emphasize the importance of simplicity and clarity in visual representation (Lowenfeld & Brittain, 1987).

Typography in the illustrated book is also designed with careful consideration of readability and visual comfort for children. The use of sans-serif fonts with proportional sizing aims to facilitate letter recognition without distracting attention from the illustrations. Child-friendly typography supports early literacy development while reinforcing the book's function as a holistic visual learning medium (White, 2011; Arsyad, 2019).

As an educational medium, illustrated books function not only as reading materials but also as tools for behavioral habituation that simultaneously engage children's cognitive and emotional aspects. Children's interaction with stories and illustrations enables processes of comprehension, imitation, and behavioral reinforcement to occur repeatedly. This process supports the gradual and sustainable formation of clean and healthy living habits, both in school and home environments (Munadi, 2013).

Studies of illustrated books indicate potential benefits for early childhood creativity and selected aspects of health learning, although these findings do not establish sustained hygiene behavior among kindergarten children (Billa et al., 2023; Pramudita & Linggardini, 2023). Consequently, illustrated storybooks provide a relevant educational design approach, while their longer-term behavioral impact requires further testing.

This study has limitations regarding the measurement of effectiveness. The evaluation primarily assessed perceived engagement, comprehension, and feasibility through validation sheets and short-term observation. The study did not employ longitudinal behavioral tracking or experimental pre-test and post-test design to confirm sustained behavioral change. Therefore, the findings should be

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interpreted as reflecting perceived appropriateness and educational potential rather than confirmed behavioral transformation.

Conclusion

This study highlights that the issue of low clean living habits among kindergarten children requires educational approaches that are aligned with their cognitive and emotional developmental stages. Conventional verbal instruction alone may not be sufficient to foster meaningful understanding and internalization of hygiene-related values.

The illustrated book designed in this study integrates visual storytelling, fable narratives, and child-friendly design elements to present clean and healthy living concepts in an accessible and engaging manner. The testing results indicate positive responses from both teachers and children, suggesting that the illustrated book is perceived as relevant, attractive, and understandable within early childhood educational settings.

Nevertheless, the findings represent perceived effectiveness and immediate engagement rather than confirmed long-term behavioral change. Further studies employing longitudinal and experimental methods are necessary to determine the sustained impact of illustrated educational media on children's hygiene behaviors.

Overall, this study contributes to the field of Visual Communication Design by demonstrating how narrative-driven illustration and Design Thinking methodology can be applied to develop contextually relevant educational media for early childhood hygiene education.

The conclusion is intended to help readers understand why your research matters. A conclusion is not merely a summary of the main topics covered or a re-statement of your research problem or findings, but a synthesis of key points. It is important that the conclusion does not leave any question unanswered.

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