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Needs Analysis of SDG 13-Based Reading Materials to Support Kindergarten Students' Behavioral Reading Engagement

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Abstrak

Ketersediaan bahan bacaan yang mendukung *behavioral reading engagement* sekaligus mengintegrasikan *Climate Action* (SDG 13) masih terbatas dalam pendidikan anak usia dini. Penelitian ini bertujuan mengidentifikasi kebutuhan guru dan siswa terhadap bahan bacaan berbasis SDG 13 untuk mendukung *behavioral reading engagement*. Penelitian menggunakan tahap *needs analysis* dalam model *Design and Development* (D&D) Richey dan Klein (2007) dan dilaksanakan di TK Telkom Singaraja. Data dikumpulkan melalui observasi kelas dan wawancara guru berdasarkan kerangka *necessities, lacks, dan wants*, kemudian dianalisis secara deskriptif. Hasil menunjukkan adanya kesenjangan antara bahan bacaan yang tersedia dan kebutuhan guru serta siswa. Bahan yang tersedia belum sepenuhnya mendukung kegiatan *shared reading* dan belum mengintegrasikan nilai *Climate Action*. Guru dan siswa membutuhkan bahan bacaan dengan kosakata sederhana, ilustrasi besar dan menarik, bahasa berulang, serta aktivitas interaktif. Temuan ini menjadi dasar pengembangan *Big Book* berbasis SDG 13 yang sesuai dengan karakteristik anak usia dini dan dirancang untuk memfasilitasi *behavioral reading engagement*.

Kata Kunci: *needs analysis, bahan bacaan, behavioral reading engagement, SDG 13, pendidikan anak usia dini*

Abstract

The availability of reading materials that support behavioral reading engagement while integrating Climate Action (SDG 13) remains limited in early childhood education. This study aimed to identify teachers' and students' needs for SDG 13-based reading materials to support behavioral reading engagement. The study employed the needs analysis stage of the Design and Development (D&D) model by Richey and Klein (2007) and was conducted at TK Telkom Singaraja. Data were collected through classroom observation and teacher interviews based on the necessities, lacks, and wants framework and analyzed descriptively. The findings revealed a gap between the available reading materials and the needs of teachers and students. The existing materials did not fully support shared reading activities or integrate Climate Action values. Teachers and students needed reading materials with simple vocabulary, large and engaging illustrations, repetitive language, and interactive activities. These findings provide a basis for developing an SDG 13-based Big Book that is appropriate for young children and designed to facilitate behavioral reading engagement.

Keywords: *needs analysis, reading materials, behavioral reading engagement, SDG 13, early childhood education*

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INTRODUCTION

Early literacy is widely recognized as an important foundation for children's cognitive, linguistic, social, and emotional development. Literacy experiences during early childhood contribute to vocabulary development, oral language, comprehension, print awareness, and communication skills, which later support children's academic achievement and lifelong learning (Whitehurst & Lonigan, 1998; Weadman et al., 2023). Early literacy is not limited to decoding written words but also includes children's interactions with books, stories, pictures, sounds, and meaningful conversations that stimulate curiosity and understanding of the world (Neuman & Dickinson, 2011). Therefore, providing meaningful and developmentally appropriate literacy experiences during the preschool years is essential for establishing positive reading habits and children's motivation to learn (OECD, 2023).

One approach that can provide meaningful literacy experiences is shared reading, in which teachers and children interact with a story through reading, questioning, responding, and discussing. During shared reading, children can observe illustrations, answer questions, repeat vocabulary, predict story events, and relate story content to their own experiences. Recent research also demonstrates that children's engagement during shared reading is observable through active and interactive behaviors and is associated with early literacy development (Son et al., 2023). Thus, shared reading should not be viewed merely as a teacher reading a story aloud, but as an interactive process in which children actively participate in constructing meaning.

The quality of children's participation during shared reading is closely related to behavioral reading engagement. Behavioral engagement refers to observable learning behaviors, including attention, participation, persistence, responding to questions, following instructions, and interaction with learning materials (Fredricks et al., 2004). In early childhood classrooms, these behaviors are particularly relevant because children's learning is often demonstrated through visible participation. In shared reading contexts, children may point to illustrations, repeat vocabulary, answer questions, predict story events, imitate expressions, or connect stories with their personal experiences. Recent research on preschool shared reading has further shown that engagement can be identified through active and interactive behaviors, with interactive engagement being related to early literacy outcomes (Son et al., 2023). Therefore, supporting children's behavioral reading engagement requires reading experiences that provide opportunities for children to see, respond, interact, and participate.

Reading materials are an important component in creating such experiences. Ideally, reading materials for young children should be developmentally appropriate, visually accessible, linguistically simple, and sufficiently interactive to encourage children's participation. Materials with attractive illustrations, repetitive language, short sentences, and meaningful storylines can help children understand the story while maintaining their attention during shared reading (Hall & O'Connor, 2006). Recent evidence also emphasizes the importance of examining children's engagement as an observable component of classroom shared reading rather than focusing only on literacy outcomes (Son et al., 2023). This indicates that reading materials should be designed not only to deliver story content but also to facilitate children's behavioral participation during reading.

One reading material that can support shared reading is the Big Book. Big Books use enlarged text and illustrations that allow children to observe story content more easily during group reading. Previous research in Indonesia has shown the potential of Big Books to support children's early reading development, while their large format and visual features make them particularly suitable for group literacy activities. For example, Antariani et al., (2021) developed a Big Book for early childhood reading activities, demonstrating the relevance of Big Book media to early literacy learning in Indonesian early childhood education. However, the use of Big Books has generally focused on literacy development, while their potential to simultaneously facilitate behavioral reading engagement and introduce sustainability-related values remains less explored.

In addition to supporting literacy, reading materials can provide meaningful contexts for introducing values related to children's everyday lives. One important issue is Climate Action (SDG 13). The Sustainable

Development Goals recognize climate action as an essential global priority, including the need to strengthen education, awareness, and individual capacity to address climate change (United Nations, 2015). In early childhood education, climate-related concepts should be introduced through concrete, meaningful, and developmentally appropriate experiences rather than abstract scientific explanations. Recent research emphasizes that early childhood education can serve as an important context for developing sustainability-oriented knowledge, attitudes, and practices (Engdahl, 2024). Studies in Indonesia have also begun to explore climate change awareness and ecoliteracy in early childhood education through activities such as gardening, recycling, and ecological storytelling (Anggraeni et al., 2025). These findings indicate that environmental and climate-related values can be meaningfully introduced to young children through contextual and engaging learning experiences.

Story-based reading materials provide a promising medium for integrating Climate Action into early childhood literacy activities. Through stories and illustrations, children can encounter concrete situations such as planting trees, caring for plants, saving water, reducing waste, and protecting nature. Such contexts can make climate-related values more understandable because they connect environmental concepts with children's everyday experiences. However, climate education in early childhood still requires developmentally appropriate materials and learning approaches that encourage children to participate actively rather than simply receive information.

The importance of appropriate reading materials becomes more evident in the context of the present study. Ideally, reading materials used in kindergarten should simultaneously support children's active participation in reading and provide meaningful contexts for developing values such as environmental responsibility. In practice, however, these two purposes are not yet fully accommodated in the observed classroom. A preliminary observation at TK Telkom Singaraja revealed that most children initially showed enthusiasm during shared reading, but several children gradually lost attention before the activity ended. The available reading materials mainly consisted of worksheets and small-sized storybooks with limited illustrations, making it difficult for all children to observe the pictures clearly during group reading. Consequently, children's participation decreased as the reading activity progressed.

The observation also showed that children's behavioral reading engagement increased when the teacher provided opportunities for interaction. Several children pointed to illustrations, answered questions such as *"What will happen if there are no trees?"* with responses such as *"It will be hot"* and *"People will feel dizzy like Bayu,"* and shared experiences of helping their parents plant trees or take care of gardens at home. These behaviors indicate that children were able to participate actively and connect story content with their experiences when supported by meaningful questions and visual representations. However, the teacher reported that the available reading materials had not yet integrated environmental themes, particularly Climate Action (SDG 13), and that some English vocabulary was too difficult for kindergarten students. The teacher therefore needed reading materials containing simple vocabulary, large and engaging illustrations, meaningful environmental messages, and interactive activities.

These findings demonstrate a clear gap between the ideal and actual conditions. Theoretically, reading materials for early childhood should be developmentally appropriate and designed to encourage active participation during shared reading, while education for sustainability should provide children with meaningful opportunities to understand and practice environmentally responsible behaviors (Engdahl & Furu 2024). In the observed classroom, however, the available materials were not yet sufficiently large, interactive, or environmentally oriented to accommodate these needs simultaneously. Therefore, there is a need to identify the actual needs of teachers and students before developing reading materials that address both behavioral reading engagement and Climate Action.

Before developing instructional materials, a systematic needs analysis is necessary to identify the characteristics of materials required by learners and teachers. Hutchinson and Waters (1987) conceptualize

needs analysis through *necessities*, *lacks*, and *wants*, which provide information about what learners need, the gaps between existing and desired conditions, and their preferences for learning experiences. Brown (2016) and Nation and Macalister (2010) further emphasize that needs analysis provides a foundation for developing relevant instructional materials based on actual learning contexts. In the present study, this framework is used to examine the needs of teachers and students in relation to reading materials that can support behavioral reading engagement while integrating Climate Action values.

Although previous studies have examined shared reading, children's reading engagement, Big Books, and environmental education, these areas have largely been investigated separately. Recent research has examined children's engagement during shared reading (Son et al., 2023), while research on early childhood sustainability education has highlighted the role of early learning environments in developing sustainability-related knowledge and practices (Engdahl & Furu 2024). In Indonesia, Big Book research has also primarily focused on supporting early reading development (Antariani et al., (2021). Meanwhile, emerging research on climate education in Indonesian early childhood settings has explored environmental awareness through activities such as gardening, recycling, and ecological storytelling (Anggraeni et al., 2025). However, limited research has examined the needs for reading materials that simultaneously facilitate behavioral reading engagement through shared reading and integrate Climate Action (SDG 13) in kindergarten education. Moreover, previous studies have more often examined or developed learning media than investigated teachers' and students' needs as an initial foundation for designing such materials.

The novelty of this study lies in its integration of three elements that have rarely been examined together in early childhood education: needs analysis, behavioral reading engagement, and Climate Action (SDG 13)-based reading materials. Rather than directly evaluating the effectiveness of an existing reading medium, this study first identifies teachers' and students' *necessities*, *lacks*, and *wants* as the empirical foundation for future material development. The study therefore extends previous research by positioning needs analysis as an essential stage for designing a Big Book that can facilitate children's observable participation during shared reading while introducing developmentally appropriate Climate Action values. In the Indonesian early childhood context, this approach provides context-specific evidence regarding the reading material characteristics needed by teachers and kindergarten students.

Accordingly, this study aims to analyze teachers' and students' *necessities*, *lacks*, and *wants* regarding SDG 13-based reading materials for kindergarten students' behavioral reading engagement. The findings are expected to contribute theoretically by strengthening the connection between needs analysis, reading engagement, and sustainability-oriented literacy in early childhood education. Practically, the findings provide an empirical foundation for developing an SDG 13-based Big Book that is developmentally appropriate, supports interactive shared reading, and facilitates children's behavioral reading engagement while introducing meaningful Climate Action values.

METHOD

This study employed the analysis phase of the Design and Development (D&D) model proposed by Richey and Klein (2007). The analysis phase was conducted to identify teachers' and students' needs for reading materials that support kindergarten students' behavioral reading engagement while integrating Climate Action (SDG 13) values. Conducting a needs analysis before developing instructional materials was intended to ensure that the proposed reading materials were relevant to students' characteristics, classroom conditions, and teachers' instructional needs.

The study was conducted at TK Telkom Singaraja, Bali, Indonesia. The participants consisted of one English teacher and 26 kindergarten students from Class A2. The students were approximately 5–6 years old. The students were selected because they were members of the class in which English reading activities were conducted and were therefore directly involved in the observed classroom activities. The English teacher was

selected because she was responsible for conducting English learning activities and had experience implementing reading activities with the students.

The students were involved in classroom observations to identify their behavioral reading engagement, responses to reading activities, and learning characteristics. The teacher participated in a semi-structured interview to provide information about the existing reading materials, students' characteristics, difficulties encountered during reading activities, and expectations for future reading materials. Data were collected through classroom observation and a semi-structured interview with the English teacher. Classroom observations were conducted two to three times, with each observation lasting approximately 40 minutes. The observations focused on students' behavioral reading engagement during reading activities and the characteristics of the reading materials used in the classroom.

The observation focused on observable student behaviors, including paying attention to the reading activity, responding to the teacher's questions, participating in discussions, interacting with illustrations or reading materials, repeating vocabulary or expressions, following the reading activity, and maintaining participation throughout the activity. These indicators were used to identify students' behavioral reading engagement during classroom reading activities. The observation checklist was developed based on the necessities, lacks, and wants framework proposed by Hutchinson and Waters (1987). In addition to the checklist, field notes were used to document students' verbal and non-verbal responses, classroom interactions, teacher strategies, and relevant classroom situations that could not be fully captured through the checklist.

A semi-structured interview was conducted with the English teacher to obtain more detailed information regarding the existing reading materials, students' learning characteristics, difficulties encountered during reading activities, and the teacher's expectations for future reading materials. The interview questions were also organized based on Hutchinson and Waters' (1987) framework of *necessities*, *lacks*, and *wants*. Two instruments were used in this study: an observation checklist and a semi-structured interview guide. The instruments were developed by the researcher based on the research objectives, the concept of behavioral reading engagement, and Hutchinson and Waters' (1987) needs analysis framework.

The observation checklist consisted of indicators related to students' observable behavioral reading engagement and the suitability of existing reading materials. The interview guide consisted of questions concerning the teacher's perceptions of students' needs, existing reading materials, classroom difficulties, and desired characteristics of future reading materials. Before data collection, both instruments were reviewed and validated by two thesis supervisors to examine the relevance, clarity, and suitability of the items to the research objectives. The researcher revised the instruments based on the supervisors' feedback before using them for data collection.

The data were analyzed qualitatively using an interactive data analysis process consisting of data collection, data condensation, data display, and conclusion drawing. First, the observation notes and interview data were organized after the data collection process. Second, relevant information was condensed by selecting observations and interview statements related to the research objectives. Third, the condensed data were coded and categorized according to the three dimensions of needs analysis: necessities, lacks, and wants. *Necessities* referred to the characteristics and functions of reading materials required to support the learning objectives and classroom activities. *Lacks* referred to the gaps between the existing reading materials and the desired conditions. *Wants* referred to the teacher's expectations and preferences regarding the characteristics of future reading materials.

After the initial categorization, related codes were grouped into broader themes, including vocabulary, illustrations, reading-material size, interactive activities, support for shared reading, behavioral reading engagement, and Climate Action content. The findings from the classroom observations and teacher interview were then compared to identify similarities, differences, and complementary information. Finally, recurring

patterns were interpreted to determine the characteristics of reading materials needed to support kindergarten students' behavioral reading engagement and integrate Climate Action (SDG 13).

The trustworthiness of the findings was strengthened through method triangulation by comparing data obtained from classroom observations and the teacher interview. Information identified through classroom observation was compared with the teacher's explanations during the interview. Consistent findings across the two data collection methods were considered as supporting evidence for the identified needs, while differences were examined during the interpretation process. Before conducting the research, the researcher obtained permission from TK Telkom Singaraja to conduct classroom observations and the teacher interview. The purpose and procedures of the research were explained to the school and participating teacher. The identities of the students, teacher, and school were treated confidentially in the research report, and the collected data were used solely for research purposes.

RESULT AND DISCUSSION

Result

Findings from Classroom Observation

The findings of this study were obtained through classroom observations conducted during shared reading activities at TK Telkom Singaraja. The observations aimed to identify students' behavioral reading engagement and evaluate the suitability of the existing reading media for supporting Climate Action (SDG 13) learning. The observation focused on students' participation, attention, responses during reading activities, and the characteristics of the reading media used by the teacher. Overall, the findings indicate that although shared reading activities had been implemented, the existing reading materials were still limited in supporting students' active engagement and introducing environmental awareness.

Table 1. Results of Classroom Observation

Aspect Observed	Indicator	Findings
Students' Attention	Focus during reading	Most students paid attention only at the beginning of the activity. Some students gradually lost focus before the story ended.
Students' Participation	Behavioral reading engagement	Students participated by answering simple questions, pointing to pictures, repeating key vocabulary, and responding to the teacher's instructions. However, only a few students actively participated throughout the activity.
Students' Responses	Interaction with illustrations	Students were more interested in colorful illustrations than written text. They frequently pointed at pictures and talked about what they saw.
Vocabulary Understanding	Language comprehension	Some students experienced difficulties understanding unfamiliar English vocabulary and relied on the teacher's explanations.
Reading Media	Suitability	The existing reading media consisted mainly of worksheets and small storybooks, making it difficult for all students to clearly see the illustrations during shared reading activities.
Climate Action Content	Environmental values	The available reading materials rarely introduced environmental awareness or Climate Action (SDG 13) values.
Students' Interest	Reading motivation	Students became more engaged when the teacher asked questions related to their daily experiences and allowed them to interact with the story.

The classroom observation results indicate that students demonstrated varying levels of behavioral reading engagement during shared reading activities. Most students initially paid attention to the story; however, several gradually lost their focus before the reading session ended. Although students showed enthusiasm toward colorful illustrations, their active participation remained limited.

During the activity, students frequently pointed at pictures while listening to the story, indicating that visual elements attracted their attention. They also responded to the teacher's questions. For example, when the teacher asked, "*What will happen if there are no trees?*", several students answered, "*It will be hot,*" and "*People will feel dizzy like Bayu.*" These responses suggest that students were able to connect the story with the Climate Action message presented in the reading material.

Students also related the story to their own experiences. When the teacher asked whether they had ever helped their parents plant trees or take care of a garden at home, some students answered that they had, while others said they had never done so. This interaction demonstrates that students were willing to share personal experiences and participate actively when the discussion was connected to familiar daily contexts.

Despite these positive responses, the observation also revealed several limitations. The reading materials currently used in the classroom were relatively small in size, making it difficult for all students to clearly see the illustrations. Furthermore, most existing reading materials focused on basic literacy skills and provided very limited opportunities for introducing Climate Action (SDG 13) values through meaningful stories. These findings indicate the need for more engaging reading media with larger illustrations, simple language, and environmental themes that are appropriate for young learners.

Findings from Teacher Interview

The findings from the semi-structured interview with the English teacher further support the classroom observation results. The interview explored the teacher's perceptions regarding students' reading engagement, the availability of reading materials, and the need for reading media integrating Climate Action values.

Table 2. Summary of Teacher Interview

Theme	Teacher's Response
Students' Reading Skill	Students need to develop listening, vocabulary, and early reading skills through interesting reading activities.
Environmental Education	Climate Action values should be introduced from an early age through simple stories related to students' daily lives.
Students' Engagement	Students become more active when reading activities include attractive pictures, interactive questions, and storytelling.
Current Reading Media	The school mainly uses worksheets and small storybooks, which are not always interesting for shared reading.
Preferred Reading Media	The teacher suggested a large-sized Big Book with colorful illustrations, simple vocabulary, repetitive sentence patterns, and environmental themes.
Shared Reading Activities	The teacher usually reads aloud, asks questions, encourages students to point at pictures, and invites them to repeat important vocabulary.
Challenges	Students have short attention spans and easily lose concentration if the story is not visually interesting.

The interview findings are consistent with the classroom observation results. According to the teacher, students generally enjoy reading activities but require attractive visual support and meaningful interaction to maintain their attention. The teacher explained that colorful illustrations, simple vocabulary, and repetitive sentence patterns help students understand the story more easily during shared reading activities.

The teacher also emphasized that environmental education should begin in early childhood because young learners are able to develop caring attitudes through stories connected with their everyday experiences. However, the teacher stated that the existing reading materials have not adequately introduced Climate Action (SDG 13) concepts in an age-appropriate manner.

Furthermore, the teacher expressed the need for a large-sized reading medium that enables all students to clearly observe the illustrations while participating in shared reading activities. Such a reading medium is expected to increase students' behavioral reading engagement by encouraging them to observe pictures, answer questions, relate stories to their own experiences, and actively participate throughout the lesson.

Discussion

The findings showed that kindergarten students needed more appropriate reading materials to support their behavioral reading engagement during shared reading activities. Classroom observations showed that some students gradually lost attention as the activity continued. The existing materials mainly consisted of worksheets and small storybooks with limited illustrations, which provided limited opportunities for children to interact with the story.

This finding is consistent with Son et al. (2023), who found that preschool children's engagement during shared reading can be observed through active and interactive behaviors. Their study also showed that interactive engagement was related to early literacy skills. Similarly, Weadman et al. (2023) found that teacher interaction during shared book reading plays an important role in supporting children's oral language and emergent literacy. Recent research by Watanabe et al. (2024) also found a relationship between the quality of shared book reading and preschool children's literacy development. These findings support the present study because students became more active when the teacher asked questions, pointed to pictures, and encouraged them to respond.

The observation also showed that children were not simply passive during reading. They pointed to pictures, answered questions, repeated vocabulary, and shared their experiences. This suggests that children's loss of attention may be related to the limited interaction provided by the existing materials. Shared reading is generally more effective when children are encouraged to respond to illustrations, questions, and story content rather than only listen to the teacher (Weadman et al., (2023); Son et al., (2023)). Therefore, reading materials for kindergarten students should provide opportunities for active participation.

These findings can also be explained through Hutchinson and Waters' (1987) needs analysis framework. The students' necessities were the need for simple, understandable, and engaging reading materials. Their lacks included limited illustrations, difficult vocabulary, and limited interactive activities. Their wants were reflected in their interest in colorful pictures, questions, repetition, and familiar topics. Thus, the needs analysis identified a clear gap between the existing materials and the students' needs.

The study also found that large illustrations, simple vocabulary, repetitive language, and interactive activities were important characteristics of reading materials for kindergarten students. This finding is supported by Antariani et al., (2021), who found that Big Book media can support beginning reading skills in early childhood. Yansyah et al. (2023) also demonstrated the potential of bilingual Big Book storytelling to support young children's literacy development.

The importance of illustrations was also visible during classroom observation. Students pointed to pictures and responded to questions when the teacher referred to the illustrations. This suggests that pictures can help children understand the story and participate in reading activities. Francis et al. (2021) similarly showed that picture books can communicate environmental concepts through the interaction between visual and verbal information.

Recent research also emphasizes the importance of interaction during reading. Weadman et al. (2023) reported that teachers use questioning, print referencing, and other oral language strategies during shared reading. In addition, Son et al. (2023) found that interactive engagement was particularly important for children's early literacy development. Therefore, attractive illustrations should be combined with questions, repetition, and opportunities for children to respond. The findings suggest that the proposed Big Book should not only be visually attractive. It should also be designed to encourage pointing, answering questions, repeating words, predicting events, and discussing pictures. These activities can make children more actively involved during shared reading.

Another important finding was the limited integration of Climate Action (SDG 13) into the reading materials used in the classroom. The existing materials mainly focused on basic literacy and provided limited opportunities to introduce environmental issues. This finding indicates a gap between literacy learning and

sustainability education. Recent studies show that environmental education can be introduced effectively during early childhood. Biber et al. (2022) also reported differences in environmental awareness and attitudes among children in different kindergarten environments. These findings suggest that children's learning environments can contribute to the development of environmental awareness.

Picture books can also provide a suitable context for environmental education. Francis et al. (2021) showed that children's picture books can communicate environmental concepts through stories and illustrations. Mukhlis et al., (2024) emphasized the importance of developmentally appropriate environmental education in early childhood. Anggraeni et al. (2025) also found that an ecoliteracy-based approach involving activities such as gardening, recycling, and ecological storytelling could support climate change awareness and environmentally friendly behavior among young children in Indonesia. These findings are relevant to the present study because they show that climate-related concepts can be introduced through simple and familiar experiences.

The present observation supports these findings. When the teacher asked what would happen if there were no trees, students responded that it would become hot and people could feel dizzy. Some students also shared experiences of helping their parents plant or care for trees. These responses show that children were able to connect environmental issues with their everyday experiences. Therefore, Climate Action can be introduced through simple stories about trees, heat, plants, and caring for the environment. However, this study did not examine whether the proposed Big Book could improve children's environmental attitudes or behavior. The findings only identify the needs that can be used as a foundation for developing the material. Therefore, future research should examine the effectiveness of the developed Big Book.

Based on the findings, the proposed SDG 13-based Big Book should include simple vocabulary, repetitive sentences, large and attractive illustrations, familiar story situations, and interactive questions. Climate Action should also be presented through simple actions that children can understand, such as planting trees, caring for plants, keeping the environment clean, and protecting nature. These characteristics are supported by previous research on Big Books, shared reading, and environmental picture books (Antariani et al., (2021); Francis et al., (2021); Yansyah et al., (2023); Son et al., (2023)). The findings also suggest that the Big Book should be designed for teacher-guided shared reading because teacher questions and discussions helped students become more active during the observed activity.

Theoretically, this study connects needs analysis, behavioral reading engagement, shared reading, and sustainability education in an early childhood context. Practically, the findings provide specific guidelines for developing reading materials that can support both children's literacy participation and their early understanding of Climate Action. Overall, the study shows that there is a gap between the existing reading materials and the needs of teachers and students. The materials currently used were not sufficient to support sustained behavioral reading engagement while introducing Climate Action. Therefore, the identified needs provide an empirical foundation for developing an SDG 13-based Big Book for kindergarten students. Further research is needed to validate the product and examine its effectiveness in supporting children's behavioral reading engagement and understanding of Climate Action.

CONCLUSION

This study highlights the importance of conducting a needs analysis before developing reading materials for early childhood education. The main contribution of this study is the identification of specific reading-material characteristics that can connect behavioral reading engagement with Climate Action (SDG 13) in shared reading activities. The findings indicate that kindergarten reading materials need to provide not only literacy support but also opportunities for active participation and meaningful connections with children's everyday experiences.

Practically, the findings provide useful guidelines for kindergarten teachers and instructional-material developers. Reading materials should include large and attractive illustrations, simple and repetitive language, familiar stories, and interactive prompts that encourage children to point, answer questions, repeat vocabulary, and share experiences. Climate Action should also be presented through simple and concrete environmental actions that are appropriate for young children. These characteristics can serve as design considerations for developing a Climate Action-based Big Book for shared reading activities.

As this study focused only on the needs analysis stage, it did not examine the effectiveness of the proposed material. Future research should continue to the design, development, expert validation, and classroom implementation stages to produce and evaluate the Climate Action-based Big Book. Further studies should also investigate whether the developed Big Book can improve kindergarten students' behavioral reading engagement and support their understanding of Climate Action (SDG 13). Thus, this study provides an empirical foundation for developing more engaging and sustainability-oriented reading materials for early childhood education.

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