



Development of DINA character-based materials to improve Pancasila learning outcomes

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ABSTRACT

The low level of student engagement in learning and the dominant use of lecture and memorization methods, which are less effective in shaping students' understanding and character, are the background to this research. This research aims to develop DINA character-based Pancasila Education teaching materials in Christianity to improve the learning outcomes of second-grade elementary school students on the theme of environmental care. This research uses the Research and Development (RnD) method with a 4D development model approach, which consists of the stages of define, design, develop, and disseminate. Data collection instruments include observation, interviews, tests, and validation questionnaires, which are developed by experts, comprising design experts, linguists, and material experts. The validation results indicate that the developed teaching materials are highly suitable for use in learning, as they meet the eligibility criteria from various aspects. The practicality of the teaching materials is also evident through positive responses from students and teachers, who find the materials interesting, easy to use, and relevant to everyday life. The effectiveness of the teaching materials is demonstrated by an increase in students' ability to understand the material, as well as positive changes in their attitudes and behaviors regarding environmental care that align with DINA character values, such as responsibility, simplicity, and sincerity. Learning becomes more enjoyable and contextual through the integration of visuals, stories, and exploratory activities. This study recommends that the development of character-based teaching materials, such as DINA, be continued and implemented in other subjects to strengthen character education from an early age.

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ABSTRAK

Rendahnya keterlibatan peserta didik dalam pembelajaran serta dominannya penggunaan metode ceramah dan hafalan yang kurang efektif dalam membentuk pemahaman dan karakter peserta didik menjadi latar belakang dilakukannya penelitian ini. Penelitian ini bertujuan untuk mengembangkan bahan ajar Pendidikan Pancasila berbasis karakter DINA dalam Katolik guna meningkatkan hasil belajar peserta didik kelas II SD pada tema peduli lingkungan. Penelitian ini menggunakan metode Research and Development (RnD) dengan pendekatan model pengembangan 4D, yang terdiri dari tahapan define, design, develop, dan disseminate. Instrumen pengumpulan data mencakup observasi, wawancara, tes, serta angket validasi oleh para ahli yang terdiri atas ahli desain, ahli bahasa, dan ahli materi. Hasil validasi menunjukkan bahwa bahan ajar yang dikembangkan sangat layak digunakan dalam pembelajaran karena memenuhi kriteria kelayakan dari berbagai aspek. Kepraktisan bahan ajar juga diperoleh melalui tanggapan positif peserta didik dan guru yang menilai bahan ajar menarik, mudah digunakan, serta relevan dengan kehidupan sehari-hari. Efektivitas bahan ajar ditunjukkan melalui peningkatan kemampuan peserta didik dalam memahami materi, serta adanya perubahan positif dalam sikap dan perilaku peduli lingkungan yang sejalan dengan nilai-nilai karakter DINA seperti tanggung jawab, kesederhanaan, dan ketulusan. Pembelajaran menjadi lebih menyenangkan dan kontekstual melalui integrasi visual, cerita, dan aktivitas eksploratif. Penelitian ini merekomendasikan agar pengembangan bahan ajar berbasis karakter seperti DINA terus dilakukan dan diterapkan dalam mata pelajaran lain untuk memperkuat pendidikan karakter sejak dini.

Kata Kunci: bahan ajar; hasil belajar; karakter DINA; peduli lingkungan; pendidikan Pancasila

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INTRODUCTION

Pancasila Education plays an important role in shaping students' character and moral values from an early age. Pancasila contains fundamental values that must be internalized by every citizen, including children at the elementary school level. These values need to be internalized so that students can understand the meaning of living as members of a nation and a state (Malik, 2020). However, in practice, the implementation of Pancasila Education in elementary schools continues to face various challenges. The learning methods employed are often conventional, such as lectures and rote memorization, which can be less engaging for students. As a result, students experience difficulties in understanding and applying Pancasila values in their daily lives (Firmansyah & Dewi, 2021).

One of the challenges in Pancasila Education learning is the lack of innovative and contextual teaching materials (Ginting, 2021). The available teaching materials tend to be theoretical in nature and provide limited relevant learning experiences for students. Insufficient student engagement in the learning process causes learners to become passive and less actively involved in understanding Pancasila values. Learning that focuses solely on theoretical aspects often fails to internalize Pancasila values in a meaningful way. Therefore, developing more engaging teaching materials that align with students' needs is necessary (Hidayat et al., 2020).

One approach for developing instructional materials is DINA character education in the Catholic context, which is based on the values of *Dapat dipercaya*, *Integritas*, *Nasionalisme*, and *Adil* (DINA). DINA character education promotes values such as diligence in prayer, repentance, simplicity, humility, sincerity, self-discipline, willingness to sacrifice, honesty, and selflessness (Firmansyah, 2020). These values are highly relevant to Pancasila Education as they instill strong moral and ethical principles in students. A character-based approach can improve students' learning outcomes and support the internalization of national values. By integrating DINA character education into instructional materials, it is expected that students will more easily understand and practice the values of Pancasila (Febriyani & Isnawati, 2022).

According to Sukiyat in the book "*Strategi Implementasi Pendidikan Karakter*", character education based on religious values can enhance students' discipline and sense of responsibility. The DINA character, which emphasizes moral and spiritual aspects, can help students develop positive habits from an early age. Through the implementation of this character education, students not only understand values cognitively but also apply them in their daily lives. The development of teaching materials grounded in DINA character education is expected to improve learning outcomes in Pancasila Education. In addition, this approach can help students develop strong character traits aligned with Pancasila values (Hidayat et al., 2020).

The development of character-education-based instructional materials using the DINA approach is intended not only to enhance students' understanding of Pancasila but also to cultivate positive habits in their daily lives. Values such as honesty, simplicity, and willingness to make sacrifices are essential in shaping good attitudes within society (Alwi et al., 2020). Through more contextual instructional materials, students can understand how these values can be applied in real-life situations (Fajariyani et al., 2023). In addition, the use of more interactive instructional materials can increase students' interest in learning. Therefore, the development of character-based instructional materials needs to be supported by more creative and innovative learning approaches (Yanti, 2021). Accordingly, the development of DINA-based character instructional materials is designed not only to instill values through behavioral reinforcement but also to encourage students' emotional engagement and personal reflection on the values being learned. The integration of these two approaches enables holistic learning by addressing the cognitive, affective, and psychomotor aspects in a balanced manner.

Empirical studies on the development of DINA character education-based instructional materials aimed at improving learning outcomes in Pancasila Education for elementary school students in Indonesia remain relatively limited compared to those in other Asian countries. Although numerous studies have examined the development of character education-based instructional materials in various contexts (Isfahani et al., 2024; Jadiddah, 2022; Rahmawati et al., 2023; Asnita, 2020), further research is still urgently needed, particularly studies that focus on the design, feasibility, practicality, and effectiveness of instructional materials in enhancing students' understanding of Pancasila values. This understanding encompasses cognitive, affective, and psychomotor aspects that are closely related to character formation, in accordance with DINA character values such as simplicity, sincerity, self-control, and a willingness to make sacrifices.

This study aims to address three main issues: how the development process of DINA character education-based instructional materials improves elementary school students' learning outcomes in Pancasila Education, the level of feasibility and practicality of these instructional materials in their implementation, and their effectiveness in enhancing students' understanding and learning achievement in the Pancasila Education subject.

LITERATURE REVIEW

Pancasila Education and Elementary School Students' Learning Outcomes

This study is grounded in Skinner's behaviorist learning theory, which emphasizes the role of reinforcement in shaping students' behavior. Through the implementation of project-based learning in Pancasila Education, students receive positive reinforcement, such as praise or rewards, to encourage the development of critical thinking skills. Punishment or negative reinforcement is also applied appropriately to reduce conceptual errors and enhance students' understanding. The shaping process is implemented through a series of gradual tasks that help students systematically develop critical thinking skills (Andrade et al., 2021). Therefore, learning approaches that support exploration and intrinsic motivation can significantly improve students' learning outcomes, as these outcomes reflect behavioral changes resulting from experience and interaction with the environment (Kandemir & Cicek, 2023). Changes in learning outcomes encompass cognitive, affective, and psychomotor aspects. The cognitive aspect is reflected in improved cognitive abilities and information analysis, whereas the affective aspect encompasses changes in attitudes, values, and emotions. The psychomotor aspect concerns physical skills that develop through practice and experience (Idris, 2021). Learning outcomes are a dynamic process influenced by relevant environmental and experiential factors. To achieve optimal outcomes, learning should be systematically designed and tailored to individual needs (Indrawan & Dibia, 2021).

Development of Instructional Materials in Elementary School Learning

Instructional materials are all materials and information used in education to provide knowledge to learners. These materials may take the form of text, images, audio, or digital media that support students' understanding of the learning content. Instructional materials encompass various types of resources used in the learning process. These learning resources may include textbooks, images, videos, or interactive media accessible via technology (Anam et al., 2021). Instructional materials are systematically designed to facilitate teachers' delivery of instruction and to support students' learning. They include various media and tools that support the learning process and enable the achievement of educational objectives (Mukarromah & Andriana, 2022). In addition to text and books, instructional materials may take the form of supporting tools, such as images, videos, or interactive modules, designed to enhance students'

understanding. Instructional materials serve as tools that facilitate students' acquisition of knowledge and skills. This is important to ensure that students can learn effectively in accordance with the established learning objectives. Well-designed instructional materials should be tailored to students' needs to facilitate comprehension of the learning content.

Instructional materials consist of various types of information designed to support the learning process. This information is systematically organized to help learners understand and master specific competencies (Alwi et al., 2020). In their development, instructional materials must consider learners' needs so that the content delivered is relevant and easily understood (Bagli & Serifoglu, 2022). Instructional materials function as a medium that bridges learning objectives and learners' understanding of the subject matter. Therefore, they should be aligned with learners' characteristics, such as age, level of understanding, and learning background. In addition, instructional materials need to be designed to achieve predetermined learning objectives. Their development requires in-depth analysis to ensure effective delivery of the content. Through a structured approach, instructional materials serve as a primary tool for supporting learners in achieving optimal learning outcomes. Well-designed instructional materials help learners more easily understand the concepts being taught (Shamsuddin & Kaur, 2020). Meanwhile, the psychomotor aspect develops as learners acquire practical skills presented in instructional materials, such as writing, speaking, or using specific tools (Firayanti et al., 2023).

DINA Character Education in the Context of Instructional Material Development

DINA character refers to a spirit of continuous prayer and repentance that fosters simplicity, humility, sincerity, self-discipline, willingness to sacrifice, and selflessness. The biblical foundation of this character education is found in the Book of Philippians 2:5–7, where Paul states, *“Have the same mindset among yourselves that was also in Christ Jesus, who, although He was in the form of God, did not regard equality with God as something to be grasped, but emptied Himself, taking the form of a servant and becoming like human beings”* (Adiyatma et al., 2023). Teaching environmental awareness can be integrated with the nine DINA character values to create meaningful learning experiences. These character values include perseverance in prayer, repentance, simplicity, humility, sincerity, self-discipline, willingness to sacrifice, honesty, and selflessness (Broto et al., 2021). Pancasila Education learning should be designed contextually so that the material presented is relevant to students' daily lives (Susilawati et al., 2021). A contextual approach helps students understand that Pancasila values are not merely theoretical concepts but can be applied to real-life situations. Teachers need to connect learning materials with students' experiences, such as how they can demonstrate mutual respect at home, at school, and in the community (Risdiyani & Anggraeni Dewi, 2021). Through this approach, students can more easily understand environmental care themes related to Pancasila values. In this way, learning becomes more meaningful and profound for students (Titussiana, 2021).

Pancasila education can be delivered through a student-centered Problem-Based Learning (PBL) approach. Through this model, students are presented with real-life problems related to environmental care themes that are solved collaboratively. By using relevant instructional materials, students learn to connect Pancasila values in addressing these problems. The PBL model is highly appropriate because it encourages students to actively engage in discussions, assignments, and recitation activities to deepen their understanding (Asrifah et al., 2020). For example, students can discuss strategies for maintaining the cleanliness of the school environment by applying the principles of deliberation and cooperation. The teacher's role in this learning process is that of a facilitator, guiding students to think critically and reflectively about environmental care issues. Discussion, assignment, and recitation methods enhance student learning (Mutiarames et al., 2021). In addition to theoretical understanding, students learn to apply Pancasila values in real-life situations through these activities. In this way, social skills such as

communication, collaboration, and empathy develop in line with the objectives of Pancasila Education (Novianti et al., 2020).

METHODS

This study employs a Research and Development (R&D) approach to develop DINA-character-based instructional materials to improve students' learning outcomes in the Pancasila Education subject. Developmental research is a systematic, structured process for designing, developing, and testing new products to enhance educational quality. This study adopts the 4D development model, which consists of four stages: Define (problem identification), Design (product design), Develop (product development), and Disseminate (product dissemination), to achieve these objectives.

This study was conducted in Grade II at SD Laudato Si Pancur Batu, one of the schools implementing the Merdeka Curriculum. The location was chosen to develop DINA character-education-based instructional materials within the context of Pancasila Education, aligned with the school's vision and mission. Grade II was selected as the research site due to its characteristics relevant to the study's objectives, namely, developing students' competencies in Pancasila through materials grounded in character values. The population of this study consisted of students at SD Laudato Si Pancur Batu. The instructional materials were tested in one Grade II class consisting of 31 students. Grade II was selected as the target group for implementing DINA-based character education instructional materials to improve Pancasila learning outcomes.

Data collection in this study was conducted using three main methods: observation, interviews, and tests, as a form of methodological triangulation. Observations were carried out directly in Grade II at SD Laudato Si Pancur Batu to record the learning process involving the use of DINA character education-based instructional materials, including teacher-student interactions and students' responses to the materials. Interviews were conducted with teachers and students to gather information about their experiences with the instructional materials, focusing on effectiveness and ease of use. In addition, evaluation tests were administered to measure students' learning outcomes after instruction, particularly on the theme of environmental care in the Pancasila Education subject. The researcher also employed questionnaires to collect data from a larger sample efficiently. All data were analyzed using descriptive statistics, with the aid of supporting software to facilitate the analysis and simplify the interpretation of results.

The instruments used in this study, such as observation sheets, interview guides, and questionnaires, were validated by experts in language, subject matter, and design to ensure their feasibility and relevance to the variables being investigated. The effectiveness of the instructional materials was assessed based on improvements in students' learning outcomes and the satisfaction levels of both teachers and students during the learning trial. Quantitative analysis techniques were employed to determine the significant impact of the instructional materials on students' understanding of rights and responsibilities within the context of Pancasila Education.

RESULTS AND DISCUSSION

Result

This study employed a research and development (R&D) approach using the 4D model, based on Thiagarajan and Semmel's theory, as presented in the book *"Instructional Development for Training Teachers of Exceptional Children"*. The following presents the results of the study implementation at Laudato Si Private Elementary School, Pancur Batu.

Define

Problems arise in Pancasila Education learning in Grade II at SD Laudato Si Pancur Batu, which still relies on conventional methods such as lectures and memorization. Students are less actively engaged, making it difficult for them to understand Pancasila values in depth. The instructional materials are monotonous and lack contextual relevance, resulting in boredom and low student motivation to learn. The learning objectives are for students to analyze various environmental issues around them by connecting them to DINA character values, such as simplicity and self-sacrifice, in efforts to preserve the environment, and to identify attitudes and behaviors that reflect environmental awareness based on DINA character values within the context of Pancasila Education. A more interactive, character-based learning approach is therefore urgently needed to facilitate students' understanding of the material.

Initial observations and discussions with teachers indicated the absence of supplementary instructional materials specifically designed to support students' understanding of environmental awareness concepts. The average student scores in Pancasila Education remained below the Minimum Mastery Criteria (KKM), with scores of 66 and 65 over the past two semesters, while the established KKM was 70. These low learning outcomes suggest that instructional effectiveness has not been optimal. Students' cognitive development, which is still at a concrete level, makes them more responsive to visual, interactive, and character-based instructional materials. Therefore, developing DINA-based instructional materials for character education is essential to enhance students' engagement and understanding.

The DINA character, which includes diligent prayer, sincerity, willingness to sacrifice, and selflessness, is highly relevant for fostering environmental awareness among early childhood students. This approach can help students understand the meaning of living in a community and as part of a nation in accordance with the values of Pancasila. Interviews with teachers revealed the need for instructional materials that go beyond theory and actively encourage students to reflect on and apply these values in real-life contexts. Teachers stated that methods such as storytelling, role-playing, and group discussions are more effective in helping students comprehend the material. With DINA-based instructional materials for character development, the learning process becomes more enjoyable and meaningful for students.

The development of contextual instructional materials tailored to students' characteristics is essential to ensure that the values of environmental awareness are deeply internalized. Content that connects to students' life experiences makes learning more relevant and applicable. The learning objective is for students to analyze the impact of practicing environmental care on collective well-being while considering principles of justice and mutual respect, as emphasized in the DINA character. Consequently, these instructional materials are expected to enhance learning outcomes in both knowledge and attitudes. Their implementation can also increase students' engagement in the learning process.

Students' scores remaining below the minimum competency criteria indicate that the learning process and instructional materials used thus far have not been effective. The development of DINA character education-based instructional materials should be carried out comprehensively and engagingly, so that students can internalize environmental care values in their daily behavior. An approach that integrates Pancasila values and religious character serves as the primary foundation for developing these instructional materials. With appropriate instructional materials, Pancasila Education at SD Laudato Si Pancur Batu is expected to become more meaningful and positively impact students' character formation. The defined stage underscores the need for innovative, developmentally appropriate instructional materials.

Design

The design stage accounted for the developmental characteristics of second-grade students, who are approximately 7–8 years old. Children at this age learn through positive reinforcement and repetition of observed behaviors. They respond well to praise and concrete visual learning experiences. Therefore, the instructional materials integrate approaches aligned with early childhood learning styles to facilitate students' understanding and internalization of the Pancasila values and the DINA character traits.

The instructional materials were designed using bright, high-contrast colors, such as yellow, pink, green, and light blue, to capture students' attention. Colors were employed to differentiate sections of the content and clarify illustrations, thereby enhancing children's focus. Simple animations, including moving characters and changing facial expressions, were also used to convey the stories' emotions. The use of color and animation aims to foster emotional engagement and reinforce the moral messages of each lesson. This approach is well-suited to meeting the visual learning needs of students at the concrete developmental stage.



Figure 1. Chapter 1 Display
Source: Author Documentation 2025

The educational exercises were designed as matching-image tasks with relevant statements and as tasks requiring students to provide opinions based on illustrations or everyday situations. These exercises help students connect the concept of environmental awareness with their own experiences in an enjoyable and instructive manner. The difficulty level of the exercises was arranged progressively, from simple to complex, to align with students' cognitive abilities. Reflective activities using images provide opportunities for students to evaluate the behaviors and values they have learned. This contributes to the development of understanding and positive attitudes toward the environment and society.



Figure 2. Comic Display and Educational Exercise Performance
Source: Author's Documentation 2025

Comics play an important role in the design by conveying moral messages and character values. The characters in the comics are depicted as children of the same age as the students, facing real-life situations such as littering or maintaining cleanliness. Simple dialogues and expressive illustrations depict the positive and negative consequences of the actions shown. These stories enable students to imitate appropriate behaviors consistent with the principles of learning through observation. The comics connect knowledge, values, and practical actions that students can apply both at school and at home.

Develop

The development stage was carried out through the validation of instructional materials designed to instill environmental awareness values. Three experts conducted validation: a design expert, a language expert, and a content expert. Each expert provided feedback and assessed the quality of the instructional materials from their respective areas of expertise. The design expert gave a score of 83%, categorized as very feasible. This assessment indicates that the visual appearance and layout of the materials are appropriate for second-grade elementary school students. Attractive illustrations and a clear structure facilitate understanding of environmental conservation concepts. This score serves as evidence that the design aspects support learning effectiveness. The language expert provided a score of 86.25%, categorized as feasible. The evaluation focused on readability, sentence clarity, and the appropriateness of vocabulary for students' age. The language used is easy to understand and communicative for early childhood learners. Short, simple sentences and familiar vocabulary help students grasp the important messages about environmental conservation.

This type of presentation makes the material feel closely connected to students' daily lives. The clarity of the language also supports students' active engagement in the learning process. Validation by a language expert indicated that the linguistic aspects were appropriate for students' needs. The subject-matter expert assessed the instructional material at 90%, placing it in the "very feasible" category. The evaluation covered content accuracy, the relevance of environmental awareness material, and alignment with the learning objectives. The material was designed to reflect real-life situations in students' daily experiences. Character values such as responsibility and love for nature

were integrated contextually. The incorporation of these values through narratives and activities helps students become more sensitive to environmental conditions. This high score reinforces the quality of the instructional content, and the material validation provides an important foundation for developing effective learning experiences.

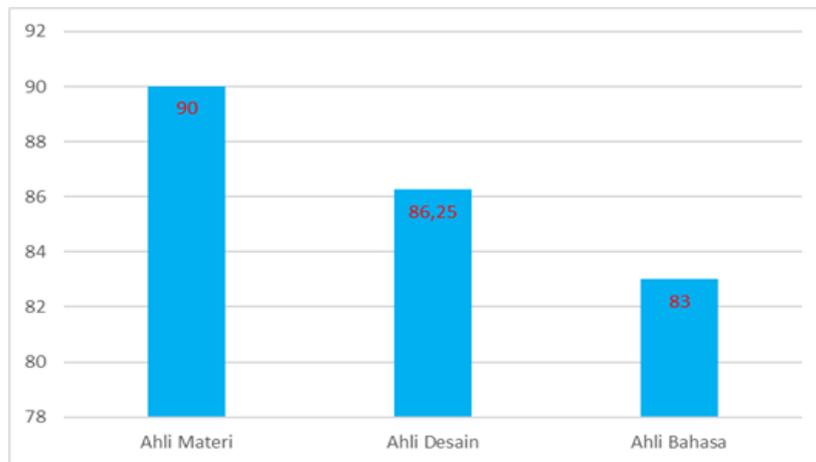


Figure 4. Expert Validation Graph
Source: Author Documentation 2025

An initial trial was conducted with five second-grade students who represented a variety of characteristics. The practicality score reached 87.25%, which is categorized as very practical. Students easily understood the content and instructions in the instructional materials. The learning activities were designed to be enjoyable and relevant to children’s experiences. The environmental awareness materials were presented as stories and activities that stimulated curiosity. Students appeared enthusiastic and engaged while using the instructional materials. This positive response indicates that the materials can be used independently by the students.

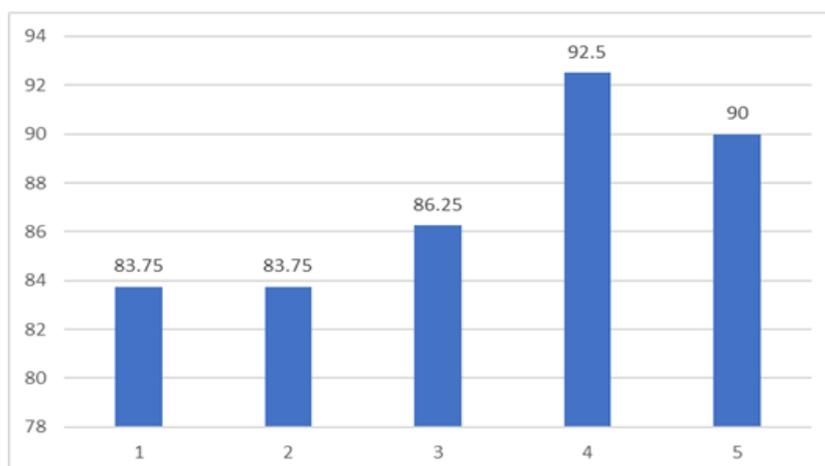


Figure 5. Practicality Graph for Small Group Testing
Source: Author's Documentation 2025

Teachers also assessed the practicality of the instructional materials using a questionnaire administered to two second-grade teachers. A practicality score of 88.1% indicated a very practical category. The

teachers stated that the instructional materials were easy to use and helpful in delivering the content. The usage instructions were clear and systematic, facilitating teaching activities. The materials' design attracted students' attention and helped them focus on the learning content. Teachers felt supported by the well-structured and comprehensive content of the materials. This assessment reinforces that the instructional materials are not only beneficial for students but also convenient for teachers. Teacher validation serves as an important consideration for broader implementation. The validity test was conducted using pretest and posttest instruments comprising 30 multiple-choice questions. Twenty-six students from another Catholic school were involved to assess the effectiveness of the instructional materials. All questions were deemed valid because the calculated r-values exceeded the r-table value (0.389), indicating that the evaluation instruments accurately measured students' understanding of environmental awareness. The reliability coefficient of 0.89 falls within the very high category, indicating that the questions consistently measure students' abilities. Item analysis showed that most questions had moderate difficulty levels and good to very good discrimination power. These valid and reliable instruments strengthen the research data and indicate that the developed instructional materials are effective in enhancing students' cognitive skills and understanding of environmental issues.

Disseminate

The DINA character-education-based instructional materials that had been developed were then directly implemented with 24 second-grade students at SD Swasta Laudato Si Pancur Batu. The primary objective of this implementation was to evaluate the effectiveness of the instructional materials in improving learning outcomes in Pancasila Education on the theme of environmental care. Students participated in learning activities using instructional materials in everyday contexts. As an initial assessment, students completed a pretest consisting of 30 multiple-choice questions before beginning the learning process. The pretest results showed an average score of 55.58, indicating a low initial mastery of the environmental care topic among the students. These findings support previous results that conventional learning has not been fully effective. The dissemination of new instructional materials is thus essential to support more contextual and engaging learning.

The posttest was administered to students after the completion of the learning process, using the same questions to assess improvements in understanding. The students' average score increased to 71.87 after using DINA-character-education-based instructional materials. This improvement in score indicates that the instructional materials effectively helped students better understand environmental care concepts. The use of visually and thematically designed materials provided an enjoyable learning experience. The change in the learning method also encouraged active student engagement in understanding environmental issues. Learning became more interesting as it combined storytelling, illustrations, and exploratory activities. These results demonstrate that age-appropriate learning media positively affect students' learning outcomes.

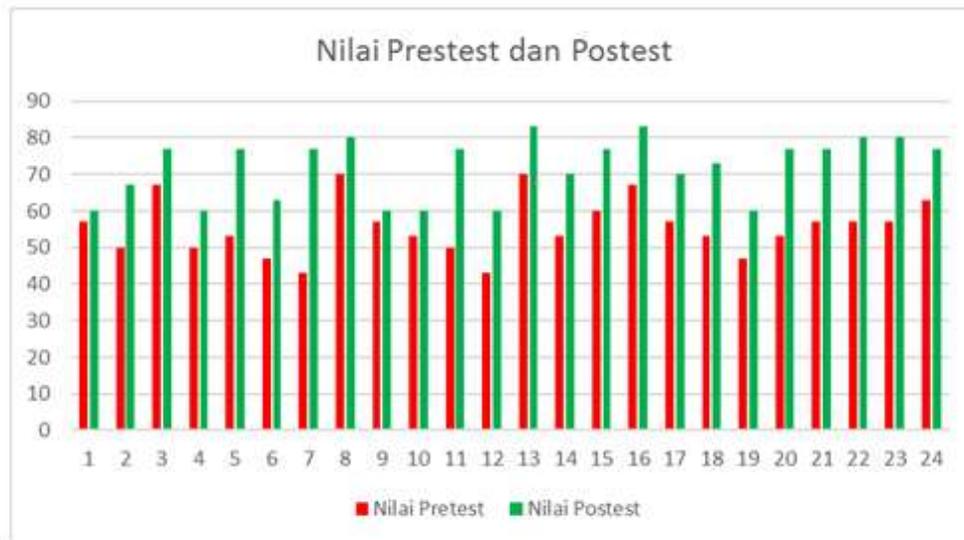


Figure 6. Graph of Pretest and Posttest Scores
Source: Author Documentation 2025

The N-Gain calculation was conducted to quantify the effectiveness of the improvement in learning outcomes. The obtained N-Gain value of 0.366 is categorized as moderate, indicating a fairly significant improvement. These results demonstrate that, although not yet optimal, the instructional materials have already shown effectiveness in shaping students' understanding. The environmental awareness content was delivered gradually and contextually, making it easy to comprehend. The DINA character values accompanied students in understanding the importance of environmental stewardship from an early age. The preparation of questions tailored to the characteristics of early childhood students also helped increase interest in learning. This strategy aligns with the Independent Curriculum approach, which emphasizes experience-based learning.

In addition to quantitative data, the practicality of the instructional materials was assessed using a questionnaire administered to students. A total of 24 students provided feedback on the ease of use, clarity, and attractiveness of the materials used during learning activities. The questionnaire results indicated an average practicality score of 84.1%, placing it in the "very practical" category. The high practicality score indicates that students felt supported and comfortable using the instructional materials. Learning activities were more active and enjoyable because the materials met their needs. Visual elements, narratives, and interactive exercises facilitated students' understanding of the theme of environmental awareness. This practicality also demonstrates that the instructional materials are suitable for implementation in lower-grade elementary school classrooms.

The instructional materials developed are not only cognitively effective but also effective in instilling character values. The DINA character values, conveyed through stories and activities, leave a positive impression on students and shape attitudes toward environmental care. These values bridge the Pancasila Education content to students' real-life experiences. Faith-based character education adds a distinctive dimension to the learning process, and the spiritual elements in instructional materials provide a more holistic dimension. The cultivation of environmental care values is carried out explicitly and implicitly through a thematic approach.

The use of media such as animations, vivid colors, and illustrated stories in instructional materials helps students understand the content more concretely. Visual components are particularly important for young learners who are still in the concrete operational stage. Presenting the material through comic stories

serves as both an educational tool and an entertaining medium for students. Students actively engage in problem-solving activities related to environmental preservation. The instructional materials foster curiosity and encourage students' enthusiasm for maintaining cleanliness and environmental sustainability. Learning activities such as coloring, storytelling, and group discussions provide opportunities for expression and comprehension. This teaching strategy creates a more meaningful learning experience for students.

A comprehensive evaluation of the dissemination stage indicates that the instructional materials are suitable for broader use in Catholic elementary schools. The effectiveness of the materials in enhancing students' understanding and character development is evidenced by posttest results and student feedback. The implementation of these materials can serve as a model for developing contextual thematic learning media. Environmentally themed learning becomes more engaging when it is grounded in real-life experiences. The Catholic values embedded in the DINA character framework provide a distinctive touch to Pancasila Education instruction, making learning not only about knowledge acquisition but also about reinforcing moral and social values. This success provides a strong foundation for adopting the instructional materials in similar schools.

Based on the psychomotor assessment, the study found that most students demonstrated a fairly good understanding of the material content and character values taught, although minor errors were still observed. This is reflected in the predominance of the "adequate understanding" category compared to the "fully correct" or "limited" categories. Regarding answer accuracy, the majority of students responded appropriately to the questions or illustrations, although the level of completeness varied. Some students demonstrated a deep understanding, providing accurate and comprehensive answers, whereas others still provided partially inaccurate responses. These findings suggest the need to reinforce the material to enable students to respond more accurately and thoroughly.

Students' ability to reflect by connecting their answers to personal experiences and the values learned was also considered fairly good. The majority of students provided relevant reasoning, although not all responses were deep or directly linked to personal experiences. Regarding neatness and readability, most students produced handwriting that was sufficiently neat and easy to read, with only a few requiring further guidance in writing tidiness. This pattern indicates that, overall, students demonstrated positive responses to the learning process in terms of content understanding, answer accuracy, reflective ability, and written presentation. Thus, learning that integrates character values can positively impact the development of both students' cognitive and affective aspects.

The dissemination of DINA-based character-education instructional materials supports the Merdeka Curriculum, which emphasizes holistic and contextual learning. This development addresses students' needs for learning approaches that are relevant and connected to everyday life. Students not only learn about the environment but also experience it and apply their knowledge through actions. This process strengthens students' socio-emotional competencies in appreciating and caring for their surroundings. The integration of character values with environmental awareness themes reinforces the mission of Catholic character education. Learning becomes richer, focusing not only on academics but also on personality development. The dissemination stage provides evidence that instructional materials play a crucial role in transforming the learning process into a more meaningful experience.

Discussion

Validation results from design, language, and content experts indicate that the instructional materials developed to instill values of environmental care in second-grade elementary students are highly feasible. The design expert assigned a score of 83%, indicating that the visual appearance and layout of the materials align with students' characteristics. In comparison, the language expert assigned a score of

86.25%, noting that the language was easily understood, communicative, and appropriate for students' developmental level. The content expert awarded the highest score of 90%, indicating that the material is relevant to students' daily lives and effectively integrates character values, such as responsibility and environmental awareness, contextually. Overall, these three assessments confirm that the developed instructional materials meet feasibility standards across multiple aspects and are suitable for use in the learning process. Diverse instructional materials are essential learning resources that support character education for students (Arifah et al., 2023). This aligns with previous research indicating that this innovative approach produces meaningful and feasible learning materials that meet the demands of character education, which requires students' emotional engagement and real-life relevance (Jadiddah, 2022). Attractive and interactive learning media can also capture students' interest, particularly in character education (Rosyiddin et al., 2023). These two studies reinforce that the development of value-based instructional materials, through contextual and interactive multimedia approaches, is an effective means of enhancing learning quality while comprehensively shaping students' character. Given these results, the potential for broader implementation of such materials may also increase alongside technological advancements in learning practices (Hidayat et al., 2022).

The trial and dissemination of DINA-based character-education instructional materials demonstrated that they are highly practical and effective in improving students' understanding of the environmental awareness theme. High practicality scores from students (87.25%) and teachers (88.1%) indicate that the materials are easy to use, engaging, and relevant to children's world, thereby enhancing students' involvement and independence in learning. The high validity and reliability of the instruments ($r > 0.389$ and reliability = 0.89) demonstrate that the evaluation items accurately and consistently measure students' understanding. Furthermore, posttest scores increased significantly from an average of 55.58 to 71.87 following instruction, reinforcing the effectiveness of the instructional materials in achieving the learning objectives. The presentation of content through stories, illustrations, and exploratory activities was effective in promoting students' critical thinking and concern for environmental issues (Isfahani et al., 2024). Additionally, teachers' competence in exploring and supporting students on broader issues, such as climate change education (CCE), also influences students' critical thinking skills (Hadiapurwa et al., 2024). Therefore, these instructional materials not only meet the criteria of practicality and validity but also positively impact learning outcomes and the development of students' character.

The trial and dissemination of DINA-based character-education instructional materials demonstrated that they are highly practical and effective in enhancing students' understanding of the environmental awareness theme. High practicality scores from both students (87.25%) and teachers (88.1%) indicate that the instructional materials are easy to use, engaging, and relevant to children's experiences, thereby increasing students' engagement and independence in learning. The high validity and reliability of the instruments ($r > 0.389$ and reliability = 0.89) indicate that the evaluation items are accurate and consistent in measuring students' understanding. Furthermore, the posttest results showed a significant increase from an average of 55.58 to 71.87 after the learning activities, reinforcing the effectiveness of the instructional materials in achieving learning objectives. Packaging content as stories, illustrations, and exploratory activities has been shown to stimulate students' critical thinking and awareness of environmental issues (Isfahani et al., 2024). In addition, teachers' competence in exploring and supporting students on broader issues, such as climate change education (CCE), also influences students' critical thinking abilities (Hadiapurwa et al., 2024). Therefore, these instructional materials not only meet the criteria of practicality and validity but also positively affect learning outcomes and students' character development.

CONCLUSION

This study indicates that the development of DINA-based character-education instructional materials for the Pancasila Education subject, focusing on the environmental care theme in Grade II elementary schools, is effective in enhancing students' understanding and fostering character that reflects moral values. The development process, conducted through the stages of define, design, develop, and disseminate, successfully produced instructional materials that are deemed feasible in terms of design, language, and content. Expert validation confirmed that the materials' quality aligns with the needs of early-age students. Furthermore, the practicality of the instructional materials is evidenced by positive feedback from both students and teachers regarding ease of use, visual appeal, and the relevance of the content to learning activities. These materials not only strengthen students' cognitive understanding of the environmental care theme but also instill character values such as responsibility, care, and humility contextually and engagingly. Therefore, the development of DINA character education-based instructional materials can serve as a relevant alternative solution to address the limitations of conventional instructional materials, which tend to be theoretical and less contextual for elementary school students.

Based on the results of this study, it is recommended that character-based instructional materials, such as DINA, be continually developed and implemented in other relevant subjects to strengthen character education from an early age. Teachers and schools are encouraged to adopt similar instructional materials that emphasize the integration of moral and spiritual values into contextual learning. Future researchers may expand the scope of the study by testing these instructional materials across different grade levels or schools, and by developing a more comprehensive evaluation model to measure changes in students' character more deeply. In addition, enriching the content and varying the delivery methods, such as through interactive multimedia, could serve as alternatives to enhance the appeal and effectiveness of learning.

AUTHOR'S NOTE

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REFERENCE

- Adiyatma, F. M., Nurhasanah, N., & Saputra, H. H. (2023). Implementasi penguatan pendidikan karakter dalam pembelajaran di kelas V SD negeri 23 Ampenan. *Jurnal Ilmiah Profesi Pendidikan*, 8(4), 2229-2234.
- Alwi, Z., Ernalida, E., & Lidyawati, Y. (2020). Pengembangan bahan ajar berbasis pendidikan karakter. *Jurnal Inovasi Sekolah Dasar*, 7(1), 1-16.
- Anam, K., Mulasi, S., & Rohana, S. (2021). Efektifitas penggunaan media digital dalam proses belajar mengajar. *Genderang Asa: Journal of Primary Education*, 2(2), 76-87.
- Andrade, M. J. De L. S., Silva, K. R. O. Da, Gama, M. S. Dos S., Souza, T. A. B. De, & Álvares, E. B. De S. O. (2021). An Analysis on the advancement of technologies and the presence of technological resources in teaching practice. *IJS - International Journal of Sciences*, 2(2), 01-04.

- Arifah, S., Arnidah, A., & Haling, A. (2023). Development of character education digital book students class VIII SMPIT Al-Hikmah Pangkajene. *Inovasi Kurikulum*, 20(2), 289-304.
- Asnita, A. (2020). Pengembangan bahan ajar PKN berbasis neurosains pada siswa kelas III sekolah dasar. *Pedagogik Journal of Islamic Elementary School*, 1(1), 89-104.
- Asrifah, S., Solihatin, E., Arif, A., & Iasha, V. (2020). Pengaruh model pembelajaran problem based learning terhadap hasil belajar pendidikan Pancasila dan kewarganegaraan siswa kelas V SDN Pondok Pinang 05. *Buana Pendidikan: Jurnal Fakultas Keguruan dan Ilmu Pendidikan Unipa Surabaya*, 16(30), 183-193.
- Bagli, H., & Serifoglu, T. E. T. (2022). Product hacking as a systematic intervention: Towards new strategies and platforms in design education. *International Journal of Technology and Design Education*, 32(4), 2319-2342.
- Broto, F. S. W. W., Suganda, T. R., & Taneo, S. Y. M. (2021). Pembuatan modul pendidikan karakter. *Asawika: Media Sosialisasi Abdimas Widya Karya*, 6(1), 1-6.
- Fajariyani, F., Rochmiyati, S., & Khosiyono, B. H. C. (2023). Pengembangan digitalisasi bahan ajar tematik berbasis pendidikan karakter pada siswa kelas VI sekolah dasar. *Tuladha: Jurnal Pendidikan Dasar*, 2(2), 139-163.
- Febriyani, S., & Isnawati, F. (2022). Penilaian otentik pada pendidikan karakter. *Dewantara: Jurnal Pendidikan Sosial Humaniora*, 1(2), 14-17.
- Firayanti, F., Rahmanpiu, R., & Musta, R. (2023). Pengembangan lembar kerja peserta didik berbasis inkuiri terbimbing untuk meningkatkan hasil belajar siswa pada materi Koloid. *Jurnal Pendidikan Kimia FKIP Universitas Halu Oleo*, 8(1), 47-57.
- Firmansyah, F. A. A. (2020). Peran orang tua dan guru untuk mengembangkan perilaku moral dan religiusitas remaja. *Prophetic: Professional, Empathy, Islamic Counseling Journal*, 3(2), 177-186.
- Firmansyah, M. C., & Dewi, D. A. (2021). Pembelajaran pendidikan Kewarganegaraan untuk membangun karakter bangsa sesuai nilai Pancasila di era globalisasi. *Pesona Dasar: Jurnal Pendidikan Dasar dan Humaniora*, 9(1), 10-22.
- Ginting, H. (2021). Pemanfaatan media belajar berbasis Canva pada mata pelajaran pendidikan Pancasila dan Kewarganegaraan. *Educare: Jurnal Penelitian Pendidikan dan Pembelajaran*, 1(2), 47-52.
- Hadiapurwa, A., Ali, M., Ropo, E., & Hernawan, A. H. (2024). Teacher effort in strengthening student's thinking skill and awareness upon environment conservation: PLS-SEM of Climate Change Education (CCE) study. *International Journal of Environmental Impacts*, 7(1), 111-119.
- Hidayat, H., Mulyani, H., Nurhasanah, S. D., Khairunnisa, W., & Sholihah, Z. (2020). Peranan teknologi dan media pembelajaran bagi siswa sekolah dasar di dalam pembelajaran pendidikan kewarganegaraan. *Jurnal Pendidikan Kewarganegaraan Undiksha*, 8(2), 57-65.
- Hidayat, M., Rozak, R. W. A., Hakam, K. A., Kembara, M. D., & Parhan, M. (2022). Character education in Indonesia: How is it internalized and implemented in virtual learning?. *Jurnal Cakrawala Pendidikan*, 41(1), 186-198.
- Idris, M. (2021). Pengembangan kurikulum dengan pendekatan model taksonomi Bloom dua dimensi. *Ta'dibi: Jurnal Manajemen Pendidikan Islam*, 9(2), 120-137.
- Indrawan, I. K. A., & Dibia, K. (2021). Motivasi berprestasi dan minat dalam belajar mempengaruhi hasil belajar bahasa indonesia siswa kelas V. *Mimbar Ilmu*, 26(3), 408-416.

- Isfahani, H., Hutasuht, S., & Siregar, Z. (2023). Pengembangan bahan ajar digital berbasis PBL untuk meningkatkan hasil belajar ekonomi siswa. *Ekuitas: Jurnal Pendidikan Ekonomi*, 11(2), 367-377.
- Jadiddah, I. T. (2022). Pengembangan bahan ajar berbasis komik di MIN 1 Kota Palembang. *Al-Madrasah: Jurnal Ilmiah Pendidikan Madrasah Ibtidaiyah*, 6(2), 334-340.
- Kandemir, I., & Cicek, K. (2023). Development an instructional design model selection approach for maritime education and training using fuzzy axiomatic design. *Education and Information Technologies*, 28(9), 11291-11312.
- Malik, A. (2020). Membumikan ideologi Pancasila melalui pendidikan Pancasila sebagai upaya membangkitkan nasionalisme. *EduTech: Jurnal Ilmu Pendidikan dan Ilmu Sosial*, 6(1), 101-108.
- Mukarromah, A., & Andriana, M. (2022). Peranan guru dalam mengembangkan media pembelajaran. *Journal of Science and Education Research*, 1(1), 43-50.
- Mutiaramses, M., Neviyarni, S., & Murni, I. (2021). Peran guru dalam pengelolaan kelas terhadap hasil belajar siswa sekolah dasar. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 6(1), 43-48.
- Novianti, E., Firmansyah, Y., & Susanto, E. (2020). Peran guru PPKn sebagai evaluator dalam meningkatkan disiplin belajar siswa. *Civics: Jurnal Pendidikan Pancasila dan Kewarganegaraan*, 5(2), 127-131.
- Rahmawati, N. W., Sahari, S., & Zunaidah, F. N. (2023). Pengembangan bahan ajar “temuan” berbasis multimedia interaktif siswa kelas V sekolah dasar. *PTK: Jurnal Tindakan Kelas*, 3(2), 155-169.
- Risdiany, H., & Dewi, D. A. (2021). Penguatan karakter bangsa sebagai implementasi nilai-nilai Pancasila. *Jurnal Pendidikan Indonesia*, 2(4), 696-711.
- Rosyiddin, A. A. Z., Fiqih, A., Hadiapurwa, A., Nugraha, H., & Komara, D. A. (2023). The effect of interactive PowerPoint media design on student learning interests. *Edcomtech: Jurnal Kajian Teknologi Pendidikan*, 8(1), 12-24.
- Shamsuddin, N., & Kaur, J. (2020). Students' learning style and its effect on blended learning, does it matter?. *International Journal of Evaluation and Research in Education*, 9(1), 195-202.
- Susilawati, E., Sarifudin, S., & Muslim, S. (2021). Internalisasi nilai Pancasila dalam pembelajaran melalui penerapan profil pelajar Pancasila berbantuan platform merdeka mengajar. *Jurnal Teknodik*, 25(2), 155-167.
- Titussiana, T. (2021). Meningkatkan kemampuan kognitif Pendidikan Pancasila dan Kewarganegaraan (PPKN) materi perumusan dan penetapan Pancasila sebagai dasar negara melalui model pembelajaran think pair share. *Pedagogik: Jurnal Pendidikan*, 16(2), 51-60.
- Yanti, F. (2021). Pengembangan bahan ajar inovatif berbasis saintifik pada materi analisis gravimetri. *Edukatif: Jurnal Ilmu Pendidikan*, 3(6), 4263-4273.