



Exploring Computational Thinking and Pancasila Values through Traditional Game-Based Unplugged Activities

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ABSTRACT

The integration of Computational Thinking (CT) and character education has become increasingly important in elementary education to support students' cognitive and social development. Traditional games offer a contextual learning environment that can connect computational thinking skills with character development and local cultural experiences. This study aims to explore the development of students' CT skills and the cultivation of Pancasila values through traditional game-based Unplugged Activities. A qualitative exploratory descriptive approach was employed involving 36 fourth-grade students participating in learning activities in class 4D at an elementary school in Surabaya. Data were collected through observation, semi-structured interviews, and documentation, and analyzed using the Miles and Huberman model. The results indicate that the implementation of Unplugged Activities through traditional games, namely gobak sodor, dakon, and hide and seek, supports the development of students' CT skills, particularly in decomposition and algorithm design. The activities also foster Pancasila values, including empathy, cooperation, sportsmanship, and fairness, as students participated in planning, following rules, solving problems, and interacting with peers. The novelty of this study lies in integrating CT development and Pancasila values within traditional game-based Unplugged Activities, providing a contextual learning approach that connects computational skills with students' social and cultural experiences. Overall, traditional game-based Unplugged Activities can serve as a meaningful learning approach for simultaneously developing elementary students' computational thinking and Pancasila values.

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INTRODUCTION

The integration of Computational Thinking (CT) and Pancasila values has become increasingly important in elementary education because it can support both students' cognitive development and character formation. CT is an important 21st-century competency that enables students to approach problems logically, systematically, and strategically (Alifah & Widodo, 2024; Tariq et al., 2025). Rather than being limited to programming or digital technology, CT involves broader problem-solving processes, including decomposition, pattern recognition, abstraction, and algorithm design (Angeli & Giannakos, 2019; Yuana et al., 2025). Research on CT has also increasingly positioned it as a competency that supports problem-solving and scientific literacy, indicating its relevance beyond computer science learning (Erwinsyah et al., 2025). In elementary education, the development of CT can therefore be introduced through learning experiences that require students to analyze problems, organize information, and develop systematic solutions. However, the implementation of CT in elementary schools may face challenges related to access to digital devices, learning resources, and teacher readiness.

These challenges are also reflected in recent research showing that the integration of CT in learning can be constrained by limited resources and the need for adequate teacher preparation (Erwinsyah et al., 2025). Unplugged Activities provide an alternative approach because they enable students to experience CT concepts without depending on computers or other digital devices. Through physical, collaborative, and contextual activities, students can practice computational processes such as breaking down problems, recognizing patterns, and designing sequences of actions (Brackmann et al., 2017; Chen et al., 2023; Kasiono et al., 2025). (Hardiyanti et al., 2025) similarly show that coding games can be implemented either with or without digital devices, allowing teachers to adapt CT learning to the facilities and learning conditions available in schools.

Pancasila values also need to be introduced through meaningful and contextual learning experiences so that students can practice these values in their everyday interactions. Values such as cooperation, fairness, responsibility, empathy, and respect are more meaningful when students encounter situations that require them to apply these values directly (Dwiputri & Anggraeni, 2021; Marlita Khaerunia et al., 2021). When Unplugged Activities are combined with traditional games, the learning process can provide opportunities for students to develop computational thinking while simultaneously practicing social and character values through direct interaction with peers. Previous studies have examined the development of computational thinking, character education, and the use of traditional games from different perspectives. Research on Pancasila-based learning has emphasized character development, while studies on unplugged learning have focused primarily on computational thinking. Other studies have demonstrated the potential of traditional games as a medium for developing students' social and character values. Studies by (Dwiputri & Anggraeni, 2021; Marlita Khaerunia et al., 2021) show that learning based on Pancasila values significantly improves students' character, such as mutual cooperation, responsibility, and nationalism. This confirms that Pancasila values are not merely normative but can also be implemented concretely in the learning process to shape students' personalities.

Research on Unplugged Activities has shown their potential to facilitate computational thinking development without requiring digital devices. (Brackmann et al., 2017) demonstrated that unplugged activities can be implemented in primary education to develop CT skills, while (Chen et al., 2023) synthesized evidence showing the effectiveness of unplugged activities across different learning contexts. (Kasiono et al., 2025) further demonstrated the relevance of unplugged coding activities for elementary students. (Hardiyanti et al., 2025) likewise identify unplugged coding games as one category of activities that can stimulate computational thinking, particularly because such activities

involve sequential procedures and problem-solving processes without requiring digital devices. These findings indicate that computational thinking can be introduced through concrete and contextual experiences rather than being restricted to computer-based learning. This approach is considered inclusive because it does not rely on the availability of technology, so it can be applied in various school settings. At the same time, research involving technology-based learning, such as the use of Canva AI, demonstrates that CT can also develop through activities that require students to organize information, think systematically, collaborate, and solve problems (Maulah et al., 2025). Thus, the development of CT is not determined solely by the presence or absence of technology, but also by how learning activities are designed to engage students in meaningful problem-solving processes.

Traditional games, as part of local cultural practices, can also provide meaningful contexts for both cognitive and social learning. Their rules, movement patterns, strategic decisions, and turn-taking processes require students to analyze situations, plan actions, and respond to changing conditions. At the same time, interaction during traditional games provides opportunities to practice cooperation, sportsmanship, fairness, responsibility, and respect for others (Prayitno et al., 2022; Widodo & Lumintuarso, 2017). Research by (Prayitno et al., 2022; Widodo & Lumintuarso, 2017) shows that traditional games can foster attitudes of cooperation, sportsmanship, honesty, and a sense of togetherness. Therefore, traditional games can function not merely as recreational activities but also as contextual learning media that connect students' cognitive processes with social and character development. Through interactions in games, students can learn to understand roles, rules, and the importance of respecting others in their social environment. This process allows values such as empathy and responsibility to develop naturally through direct experience (Prayitno et al., 2022). Thus, traditional games serve not only as entertainment but also as effective educational tools for contextually shaping students' character.

Although previous studies have demonstrated the potential of unplugged activities for developing computational thinking and the role of traditional games in character formation, these two areas have generally been examined separately. Research on unplugged activities has primarily emphasized computational thinking development, whereas research on traditional games has focused more strongly on social interaction and character development. Similarly, Pancasila-based learning has emphasized students' character formation but has rarely been explicitly connected to computational thinking processes. Existing research on CT also demonstrates that learning can be supported through various media, including digital and non-digital activities, but there remains a need to explore culturally familiar learning contexts that simultaneously address cognitive and character development. Therefore, there is a need to explore learning activities that integrate computational thinking, Pancasila values, and local cultural practices within a single learning context.

The present study addresses this gap by exploring traditional game-based Unplugged Activities as a learning context for developing computational thinking and Pancasila values among fourth-grade elementary school students. Specifically, the study examines how students demonstrate computational thinking processes, particularly decomposition and algorithm design, while participating in gobak sodor, dakon, and hide-and-seek. At the same time, the study examines the emergence of Pancasila-related values such as cooperation, empathy, sportsmanship, fairness, responsibility, and respect during the activities.

This research aims to provide a comprehensive understanding of the implementation of innovative learning that integrates Unplugged Activities, traditional games, CT skills, and Pancasila values. Specifically, this research focuses on two main objectives: to explore in-depth the planning and implementation of traditional game-based Unplugged Activities, including how teachers design learning scenarios, select relevant games, and integrate them with CT skill indicators and Pancasila

values; and to describe the CT skills and Pancasila values developed in students during the learning process, including aspects of decomposition, pattern recognition, abstraction, and algorithm development, as well as attitudes of mutual cooperation, cooperation, responsibility, honesty, and mutual respect. To achieve these objectives, this study addresses two research questions: how traditional game-based Unplugged Activities are planned and implemented in learning, and how CT skills and Pancasila values develop in students during the learning process.

This research provides meaningful theoretical, practical, and policy contributions to the development of innovative, contextual, and culturally based learning. Theoretically, this research enriches educational studies by demonstrating that CT can be harmoniously integrated with Pancasila-based character education through the use of traditional games, thereby strengthening a holistic learning approach. Practically, this research offers alternative strategies for elementary school teachers in designing learning that is independent of digital technology but still effective in developing systematic thinking skills while fostering the values of cooperation, honesty, responsibility, and mutual cooperation. Furthermore, this approach also creates an active, enjoyable, and relevant learning environment for students, while strengthening local cultural identity. From a policy perspective, this research supports the implementation of the Independent Curriculum, particularly in strengthening the Pancasila Student Profile through adaptive, innovative learning that aligns with the demands of 21st-century competencies without neglecting national character.

METHODS

This study employed a qualitative design with an exploratory descriptive approach to gain a deeper understanding of the implementation of traditional game-based Unplugged Activities in developing students' Computational Thinking (CT) skills and Pancasila values. This approach was chosen because the research focused not on hypothesis testing but on exploring and describing the learning process in a natural and real-world context. The exploratory descriptive approach enabled the researchers to obtain a comprehensive understanding of the planning, implementation, and interactions that occurred during the learning activities, while the qualitative approach allowed the researchers to capture students' attitudes, behaviors, interactions, and values that could not be adequately represented through quantitative measurements. The use of a qualitative approach is also consistent with previous educational research that has explored CT through observation of students' activities, interactions, and problem-solving processes in authentic learning contexts (Maulah et al., 2025; Yuana et al., 2025).

This research was conducted from January to February 2026 in accordance with the elementary school academic calendar to avoid disrupting regular learning activities. During this period, the researchers conducted the stages of preparation, implementation, and data collection through observations, interviews, and documentation. The research was conducted at a public elementary school in southern Surabaya, which was selected based on its suitability for the research objectives and its potential to implement Unplugged Activity-based learning integrated with traditional games. The social and cultural environment of the school also supported the integration of local values into the learning process.

The study involved 36 fourth-grade students in class 4D, consisting of 21 boys and 15 girls, aged between 9 and 10 years. The participants were selected because fourth-grade students are at a developmental stage in which they begin to demonstrate logical thinking about concrete situations, understand rules, work collaboratively, and develop social values through group interactions. These characteristics were considered appropriate for learning activities involving traditional games and

Unplugged Activities, which require students to engage directly with concrete situations while making decisions, solving problems, and interacting with peers.

Data were collected through observation, semi-structured interviews, and documentation. Observations were conducted during the learning activities to directly identify students' participation, interactions, strategic thinking, and the emergence of CT skills and Pancasila values during the traditional game-based Unplugged Activities. Semi-structured interviews were conducted with students and teachers to obtain deeper information about their experiences, understanding, and responses to the learning process. Documentation in the form of photographs and videos was used as supporting evidence to strengthen the observation and interview data and to provide a more comprehensive representation of the learning activities. The use of multiple data collection techniques also enabled the researchers to compare information obtained from different sources during the analysis process.

The research instruments consisted of observation sheets, interview guides, and documentation. The observation sheets were developed to identify CT indicators, including decomposition, pattern recognition, abstraction, and algorithm development, as well as indicators related to Pancasila values, such as mutual cooperation, responsibility, honesty, empathy, sportsmanship, and fairness. The semi-structured interview guide was designed to maintain the focus of the investigation while allowing the researchers to explore participants' responses in greater depth. Photographs and videos were used as visual documentation of students' activities and behaviors during the implementation of the traditional games.

The research procedure consisted of three stages: pre-research, implementation, and post-research. During the pre-research stage, the researchers prepared learning materials and research instruments and coordinated with the school. The implementation stage involved the execution of traditional game-based Unplugged Activities and direct observation of the learning process. In the post-research stage, interviews were conducted with participants and the collected data were analyzed according to the research objectives. The activities were organized to provide opportunities for students to discuss strategies before playing, participate in group games, and reflect on their experiences after the activities.

Data analysis employed the Miles and Huberman interactive model, consisting of data reduction, data presentation, and conclusion drawing. During data reduction, information obtained from observations, interviews, and documentation was selected, focused, and simplified according to the research objectives. The data were subsequently categorized based on CT indicators and Pancasila-related values. In the data presentation stage, the categorized information was organized systematically to facilitate the identification of patterns and relationships among students' activities, CT processes, and character-related behaviors. Conclusions were then drawn gradually by interpreting the patterns identified in the data. The conclusions were verified by comparing information obtained from different data sources to ensure consistency with the conditions observed in the field. A manual categorization table was also used to organize observation data, interview results, and documentation according to relevant themes, allowing the researchers to trace relationships among the different sources of evidence.

FINDINGS AND DISCUSSION

Planning and Implementation of a Traditional Game-Based Unplugged Activity to Instill Pancasila Values in Fourth Grade Elementary School Students

The planning of traditional game-based Unplugged Activities was conducted systematically and contextually based on the characteristics and learning needs of fourth-grade elementary school students. The planning process began with classroom observations to identify classroom conditions,

student characteristics, and existing learning patterns, followed by interviews with teachers to obtain information regarding students' learning needs and teachers' readiness to implement innovative learning activities. The observations and interviews indicated that students already demonstrated simple strategic thinking skills, such as understanding game rules, planning moves, anticipating possible situations, and working collaboratively in groups. These findings became the basis for designing learning activities that were appropriate to students' cognitive and social development.

Based on the initial observations and interviews, the learning scenario was designed by integrating Unplugged Activities with three traditional games is gobak sodor, dakon, and hide-and-seek. The activities were designed to connect game situations with computational thinking processes, particularly decomposition and algorithm design, while simultaneously providing opportunities for students to practice Pancasila-related values such as cooperation, responsibility, honesty, empathy, sportsmanship, and fairness. The learning sequence consisted of a pre-game strategy discussion, group play, and post-game reflection. During the strategy discussion, students exchanged ideas and planned possible actions before playing. During the game, students implemented their strategies, responded to changing situations, and interacted with their peers. The reflection stage allowed students to discuss their experiences and relate the strategies and behaviors demonstrated during the games to the learning objectives.

The use of traditional games in the learning design was relevant because the games provided concrete situations through which students could engage in problem-solving and strategic thinking. Rather than introducing computational thinking through abstract explanations, students encountered problems directly through the rules and situations of the games. This is consistent with research on Unplugged Activities, which demonstrates that computational thinking can be developed through activities that do not depend on digital devices (Brackmann et al., 2017; Chen et al., 2023; Kasiono et al., 2025). (Hardiyanti et al., 2025) similarly identified coding games, including unplugged activities, as learning experiences that can stimulate computational thinking through concrete and sequential activities. The present study extends this perspective by using traditional games that are culturally familiar to students, thereby connecting computational thinking with students' existing experiences.

The planning also considered the social and character dimensions of the learning activities. The inclusion of cooperation, responsibility, honesty, empathy, sportsmanship, and fairness was not treated as an additional activity separate from the games. Instead, these values were embedded in the rules, interactions, and reflection process. This is consistent with previous research demonstrating that traditional games can contribute to character development through direct social interaction and participation (Prayitno et al., 2022; Widodo & Lumintuarso, 2017). Therefore, the planning of the learning activities created an opportunity for computational thinking and Pancasila-related values to be developed within the same learning experience. Each game provided a different context for students to apply strategic and systematic thinking. In gobak sodor, students discussed strategies, analyzed the positions and movements of opponents, and determined possible routes before playing. These activities required students to divide the playing situation into manageable components and organize possible actions, reflecting decomposition and algorithm design. In dakon, students considered the sequence of moves and possible consequences before deciding which action to take. Meanwhile, in hide-and-seek, students anticipated the possible movements of the seeker and selected appropriate hiding strategies. These activities demonstrate that the games provided students with concrete problems requiring them to analyze situations and make decisions rather than simply follow predetermined rules.

The implementation of the learning activities further showed that the traditional games could function as meaningful Unplugged Activities. Students were actively involved in determining strategies, testing their decisions, responding to changing conditions, and reflecting on the results. This

finding is in line with (Brackmann et al., 2017), who demonstrated that unplugged activities can support CT development among primary school students, and (Chen et al., 2023), whose review and meta-analysis identified the potential of unplugged activities to foster CT. (Kasiono et al., 2025) further showed that unplugged coding activities can increase elementary students' engagement while supporting computational thinking. In the present study, however, the computational processes were embedded within traditional games, making the learning experience more closely connected to students' physical and social environment. The implementation of the activities also provided opportunities for students to practice Pancasila-related values through direct interaction.

Students demonstrated cooperation when working together to develop strategies and achieve shared goals. Empathy emerged when students helped peers who experienced difficulties, while sportsmanship was reflected in students' willingness to follow the rules and accept the outcomes of the games. Fairness appeared through turn-taking and equal opportunities to participate, while responsibility was demonstrated when students followed agreed rules and carried out their roles. These findings support (Prayitno et al., 2022; Widodo & Lumintuarso, 2017), who found that traditional games can provide opportunities for students to develop cooperation, sportsmanship, honesty, responsibility, and social interaction.

The findings therefore indicate that the implementation of traditional game-based Unplugged Activities did not merely provide students with an enjoyable learning experience but also created a context in which cognitive and character development could occur simultaneously. This integration is important because computational thinking and Pancasila values were not taught as separate components. Instead, students developed systematic thinking while engaging in social interaction, following rules, making decisions, and responding to their peers. Such an approach is consistent with (Yuyung et al., 2024), who emphasize the importance of integrating cognitive and ethical dimensions within learning to support more holistic student development.

Students' CT Skills and Pancasila Values Developed Through the Implementation of Traditional Game-Based Unplugged Activities

The findings demonstrated that students' computational thinking processes emerged naturally during their participation in the three traditional games. Among the CT components observed, decomposition and algorithm design were particularly evident. Decomposition appeared when students broke down complex game situations into smaller and more manageable elements, while algorithm design emerged when students organized actions or strategies into a sequence to achieve a particular goal. These processes were observed through students' discussions, decisions, movements, and responses to changing situations during the games.

In gobak sodor, students demonstrated decomposition when they considered different elements of the game, including the positions of opponents, available movement routes, and the actions of their teammates. Instead of viewing the game as a single complex situation, students considered these elements separately before deciding on an appropriate strategy. Algorithm design emerged when students arranged a sequence of movements to pass through the playing area while avoiding the opposing players. This process illustrates how a familiar traditional game can provide a concrete context for computational thinking. The finding is consistent with (Tariq et al., 2025), who describe computational thinking as a systematic approach to problem-solving, and with (Yuana et al., 2025), who emphasize the importance of algorithmic and systematic thinking in CT development. Similar processes were observed in dakon. Students needed to consider the arrangement of seeds, determine where to begin, and anticipate where the seeds would be distributed as a consequence of their actions. The decision-making process required students to consider the relationship between an initial action

and its possible consequences. This demonstrates that the game created an opportunity for students to think sequentially and strategically. Although students were not explicitly taught programming concepts, they were engaging in processes that resemble algorithmic thinking because they needed to determine a sequence of actions based on the rules and expected outcomes of the game.

In hide-and-seek, students demonstrated computational thinking through the anticipation of possible movements and the selection of strategies. Students considered the location of the seeker, identified possible hiding places, and anticipated how the seeker might move. These processes required students to analyze the situation, identify relevant information, and select an action based on their prediction. The findings demonstrate that CT can emerge through physical and social activities in which students are required to solve problems and make decisions. This supports the broader argument in the literature that CT is not limited to computer programming but can be developed through contextual problem-solving activities (Brackmann et al., 2017; Chen et al., 2023; Tariq et al., 2025). The findings also complement research by (Hardiyanti et al., 2025), which highlights the role of coding games in stimulating CT among young learners. However, while coding games may be deliberately structured around computational concepts, the present study demonstrates that computational processes can also emerge naturally from traditional games that students already recognize and understand. This distinction is important because it shows that teachers do not necessarily need to introduce entirely new technological activities to develop CT. Existing cultural activities can be redesigned and positioned as learning contexts when their rules and processes are intentionally connected to CT indicators.

The use of traditional games as an unplugged learning context also supports the findings of (Kasiono et al., 2025), which demonstrate that unplugged coding can support CT development among elementary students. However, the present study adds a cultural dimension by using gobak sodor, dakon, and hide-and-seek. The students therefore encountered computational thinking through activities that were physically active, socially interactive, and culturally familiar. This combination may help make CT concepts more accessible to elementary students because the learning begins from experiences that they can directly understand.

In addition to computational thinking, the findings revealed the emergence of several Pancasila-related values during the implementation of the traditional games. These values included empathy, cooperation, sportsmanship, fairness, and responsibility. The values were observed through students' interactions, their responses to peers, their adherence to rules, and their participation in group activities. Rather than being developed through verbal instruction alone, these values emerged through direct experiences during the games. Cooperation was particularly evident when students discussed strategies, coordinated their actions, and worked toward shared goals. Students needed to communicate with one another and consider the contributions of their teammates. This finding is consistent with (Prayitno et al., 2022), who emphasize that traditional games can provide opportunities for children to develop cooperation and togetherness. Similarly, (Widodo & Lumintuarso, 2017) demonstrate that traditional games can be used as a medium for character development because they require students to interact, follow rules, and participate in shared activities.

Empathy emerged when students responded to the needs and difficulties of their peers. Students showed concern when classmates experienced difficulties in understanding the rules or participating in the game and provided assistance when necessary. This finding is important because it demonstrates that the social interaction created by traditional games can provide opportunities for students to practice character values in authentic situations. (Yuyung et al., 2024) emphasize that meaningful learning should connect cognitive development with ethical and social dimensions. The present findings support this perspective by showing that character-related behaviors can emerge alongside

cognitive processes during the same activity. Sportsmanship and fairness were also evident in students' responses to the rules and outcomes of the games. Students were expected to follow agreed rules, take turns, accept the results of the games, and respect other players.

These experiences provided concrete opportunities to practice fairness and sportsmanship. Such findings are consistent with (Prayitno et al., 2022), who identify sportsmanship and honesty as values that can be developed through traditional games. The traditional game context therefore provided a natural environment for students to experience the consequences of following or violating rules and to understand why fairness is important in social interaction. Responsibility emerged through students' participation in assigned roles and their commitment to following the rules of the games. Students were responsible for carrying out their roles, respecting the agreed procedures, and contributing to the group activity. This finding supports previous research concerning character development through traditional games and strengthens the argument that traditional games can function as contextual learning media for character education.

The emergence of these values demonstrates that the use of traditional games can provide a meaningful context for Pancasila-oriented learning. (Ningsih, 2023) highlights the importance of contextual activities in supporting the development of the Pancasila Student Profile through collaboration and problem-solving. In the present study, students experienced collaboration and problem-solving directly through the games. They were required to make decisions, cooperate with peers, follow rules, and take responsibility for their actions. Thus, traditional game-based Unplugged Activities can support the development of Pancasila-related values through direct and meaningful experiences.

One of the most important findings of this study is that computational thinking and Pancasila-related values emerged within the same learning activities. Students did not develop CT in isolation from their social interactions. When they planned strategies, they communicated with peers; when they followed sequences of actions, they also followed agreed rules; and when they responded to the outcomes of the games, they practiced sportsmanship and fairness. This demonstrates that traditional game-based Unplugged Activities can provide an integrated learning context in which cognitive and character competencies develop simultaneously.

This integration distinguishes the present study from previous research that has tended to examine computational thinking and character development separately. Studies by (Brackmann et al., 2017; Chen et al., 2023; Hardiyanti et al., 2025; Kasiono et al., 2025) primarily demonstrate the potential of unplugged activities or coding games for computational thinking development, whereas (Prayitno et al., 2022; Widodo & Lumintuarso, 2017) emphasize the character-development potential of traditional games. The present study brings these perspectives together by demonstrating that traditional games can serve as an unplugged context in which computational thinking and Pancasila-related values are developed through the same learning experience.

The findings also provide a culturally contextualized alternative to technology-dependent CT learning. Research such as (Maulah et al., 2025) demonstrates that digital tools can support CT development through systematic, collaborative, and problem-solving activities. However, the present study demonstrates that similar cognitive processes can be stimulated through activities that do not require digital devices. This does not imply that traditional games should replace digital learning. Rather, the findings suggest that teachers can select learning contexts according to students' needs, available resources, and educational objectives. In schools with limited access to digital technology, traditional game-based Unplugged Activities can provide an accessible alternative while maintaining opportunities for students to develop 21st-century competencies.

Overall, the findings demonstrate that traditional game-based Unplugged Activities can function as a contextual bridge between contemporary educational competencies and local cultural practices. Through gobak sodor, dakon, and hide-and-seek, students experienced computational thinking through concrete problem-solving situations while simultaneously practicing empathy, cooperation, sportsmanship, fairness, and responsibility. The approach therefore supports the broader orientation of elementary education toward holistic student development and is relevant to the implementation of the Merdeka Curriculum, particularly the development of the Pancasila Student Profile. As (Ningsih, 2023) suggests, contextual learning can provide opportunities for students to develop collaboration and problem-solving skills through meaningful experiences. The present study extends this perspective by demonstrating that traditional games can provide such experiences while also serving as a medium for computational thinking development.

CONCLUSION

The findings of this study indicate that traditional game-based Unplugged Activities provided a meaningful and contextual learning experience for developing computational thinking and Pancasila-related values among fourth-grade elementary school students. Through the implementation of gobak sodor, dakon, and hide-and-seek, students demonstrated computational thinking processes, particularly decomposition and algorithm design, by analyzing game situations, identifying manageable components, planning strategies, and organizing sequences of actions. The learning activities also provided opportunities for students to practice Pancasila-related values, including empathy, cooperation, sportsmanship, fairness, and responsibility through direct interaction with peers.

The planning and implementation of the activities demonstrated that traditional games can be intentionally designed as Unplugged Activities by connecting game rules, strategies, and interactions with computational thinking indicators and character values. The pre-game strategy discussions, group activities, and post-game reflections provided students with opportunities to develop systematic thinking while simultaneously practicing social and character-related values. These findings reinforce previous research on the potential of Unplugged Activities for developing computational thinking and traditional games for supporting character development, while extending these perspectives by integrating both dimensions within a culturally familiar learning context.

This study therefore demonstrates that computational thinking and Pancasila-related values do not need to be developed through separate learning activities. Traditional games can serve as a bridge between contemporary 21st-century competencies and local cultural practices by providing concrete situations in which students solve problems, develop strategies, cooperate with peers, follow rules, and take responsibility for their actions. The approach also provides an alternative for elementary schools, particularly those with limited access to digital technology, to introduce computational thinking through active, collaborative, and culturally relevant learning experiences.

However, the findings should be interpreted within the context of the study. The research was conducted with fourth-grade students in a specific elementary school and within a relatively limited research period. Therefore, the findings cannot be generalized directly to all grade levels or educational settings. Future research may examine the implementation of traditional game-based Unplugged Activities across different grade levels and school contexts, as well as investigate their development over a longer period. Quantitative or mixed-methods research could also be conducted to examine changes in students' computational thinking and Pancasila-related competencies more systematically. The development of structured learning modules, assessment instruments, and teacher guidelines may

further support the wider implementation of traditional game-based Unplugged Activities in elementary education.

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