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The Effect of the Unplugged Activities Method on Computational Thinking Skills in Elementary School Students

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INFORMASI ARTIKEL	ABSTRAK
Article History: Received: 02 June 2026 Revised: 02 June 2026 Accepted: 03 June 2026 Published: 31 July 2026 **Kata Kunci:** Unplugged Activities; Inkuiri Terbimbing; Berpikir Komputasi Sekolah Dasar; Pembelajaran Berbasis Aktivitas	Kemampuan berpikir komputasi merupakan kompetensi penting abad ke-21. Kemampuan ini dapat melatih siswa sekolah dasar untuk berpikir logis, sistematis, dan mandiri dalam memecahkan masalah. Penelitian ini bertujuan untuk menguji pengaruh penerapan metode *unplugged activities* yang dipadukan dengan model inkuiri terbimbing terhadap kemampuan berpikir komputasi siswa sekolah dasar. Penelitian menggunakan pendekatan kuantitatif dengan metode *quasi-experiment* dan rancangan *nonequivalent control group design*. Subjek penelitian terdiri dari 42 siswa yang dibagi ke dalam kelompok eksperimen dan kelompok kontrol. Pengumpulan data dilakukan menggunakan tes tertulis berbentuk soal uraian yang dikembangkan berdasarkan empat pilar berpikir komputasi, yaitu dekomposisi, pengenalan pola, abstraksi, dan algoritma. Hasil uji independent t-test menunjukkan nilai signifikansi sebesar 0,004, yang berada di bawah taraf signifikansi 0,05. Hal ini membuktikan terdapat perbedaan yang signifikan antara kelompok eksperimen dan kelompok kontrol yang diberikan perlakuan yang berbeda. Dengan demikian, kombinasi metode unplugged activities dan model inkuiri terbimbing terbukti dapat memberikan pengaruh terhadap kemampuan berpikir komputasi siswa sekolah dasar.
Keywords: Unplugged Activities; Guided Inquiry; Computational Thinking Elementary School; Activity-Based Learning	**ABSTRACT** Computational thinking skills are an important competency of the 21st century. This ability can train elementary school students to think logically, systematically, and independently in solving problems. This study aims to examine the effect of the application of the unplugged activities method combined with a guided inquiry model on the computational thinking ability of elementary school students. The study uses a quantitative approach with a quasi-experiment method and a nonequivalent control group design. The study subjects consisted of 42 students who were divided into an experimental group and a control group. Data collection was carried out using a written test in the form of description questions developed based on the four pillars of computational thinking, namely decomposition, pattern recognition, abstraction, and algorithms. The results of the independent t-test showed a significance value of 0.004, which was below the significance level of 0.05. This proves that there is a significant difference between the experimental group and the control group that is given different treatment. Thus, the combination of the unplugged activities method and the guided inquiry model has been proven to have an influence on the computational thinking ability of elementary school students.

1. Introduction

The rapid development of digital technology in the era of the Industrial Revolution 4.0 and Society 5.0 has provided significant changes in various sectors of life, including the field of education. The use of technology such as artificial intelligence, big data, and automation requires the world of education to prepare students who are not only able to use technology but also understand logical and systematic ways of thinking in dealing with 21st-century problems (World Economic Forum, 2020). This transformation is even more evident after the pandemic, which emphasizes the importance of strengthening digital literacy and competence in building an inclusive and resilient education system (UNESCO, 2024).

One of the important skills that needs to be developed to answer these demands is the ability to think computationally. Computational thinking skills are seen as one of the important competencies in 21st-century education that is equivalent to reading, writing, and arithmetic skills (Li et al., 2020). Various international organizations emphasize that computational thinking is necessary to help students understand and solve complex problems in a logical, systematic, and structured manner amid rapidly developing technological and information advancements.

Computational thinking is not just about learning to code or using computers; it is the ability to develop a logical, systematic, and structured way of thinking to solve problems. Through computational thinking skills, students are trained to solve problems, recognize patterns, formulate solution steps, and think critically and creatively that can be applied in various subjects and daily life (Center for Education Quality Assurance, 2025). In fact, according to El-Hamamsy, Chessel-Lazzarotto, Bruno et al. (2021), integrating computational thinking into schools is increasingly important because the future requires individuals who are able to solve complex problems systematically and creatively. Therefore, developing computational thinking skills from the elementary school level is seen as a strategic step in preparing students who are adaptive to the development of the times.

In line with these global developments, the education system in Indonesia has also begun to pay attention to strengthening computational thinking skills since basic education. Through the Educational Standards, Curriculum, and Assessment Agency (BSKAP), the Government of Indonesia has set the subject of Coding and Artificial Intelligence (KKA) for elementary school students in grades V and VI starting in 2025. This policy emphasizes the importance of developing computational thinking skills from the elementary school level, as stated in the Academic Manuscript of Coding and Artificial Intelligence Learning (Ministry of Primary and Secondary Education, 2025). Through this policy, students are expected not only to play the role of technology users, but also to understand the logic and thought processes that are the basis of digital technology.

However, based on research conducted by Fitriyah, Wahyudin, Nurhayati, & Febrianti (2024), it is stated that the computational thinking skills of students in Indonesia are still relatively low. This is reflected in the results of the 2023 Bebras Challenge, which shows that as many as 87% of Indonesian students obtain a computational thinking score below the minimum threshold (score < 50). The data indicates that the computational thinking skills of elementary school students still need attention and systematic reinforcement. In addition, computational thinking skills are also reflected in the results of PISA 2022, especially in the field of mathematics, which shows that only 18% of Indonesian students have reached level 2 (the minimum proficiency level in mathematics), far below the OECD country average of 69% (OECD, 2023). This PISA question has the same characteristics as the computational thinking indicator, so this condition shows that the computational thinking ability of Indonesian students is still relatively low and requires serious development efforts in learning (Amelia in Widodo, Cilviani, Rahayu, & Ramarumo, 2023).

This condition is influenced by several causative factors, one of which is the limitation of facilities and infrastructure to support technology-based learning. Data from the Central Statistics Agency shows that the proportion of elementary schools in 2022 that have access to computers is still low, which is around 5.31% (BPS-Statistics Indonesia, 2024). In addition, the majority of elementary schools in Indonesia still do not have an adequate number of devices to support digital-based learning (Ministry of Primary and Secondary Education, 2025). In addition to infrastructure limitations, teachers' pedagogical readiness is also a factor that affects the lack of optimal learning of computational thinking in elementary schools. Many elementary school teachers do not have an educational background in informatics, so learning to think computationally that relies on digital devices can become an additional burden for teachers. This condition can cause difficulties in implementing learning and can affect teachers' low confidence in applying computational thinking skills to learning activities.

The Academic Manuscript of Coding and Artificial Intelligence Learning recommends the use of unplugged learning methods as one of the more inclusive solutions in developing computational thinking skills, especially at the elementary school level. The unplugged learning method is a computational thinking learning method without the use of digital devices, so it is considered relevant to be applied to school conditions that have limited technological infrastructure and teacher readiness. A systematic literature review conducted by Hartono, Agustini, and Sudatha (2025) from several international journals states that, at the elementary level (kindergarten and elementary), improving computational thinking skills is more effective when students are first given unplugged learning as scaffolding before moving to plugged learning. This emphasizes that this method is suitable for application in elementary schools, especially in schools that do not have adequate technological infrastructure, and also serves as a bridge to understand and develop computational thinking processes before being introduced to digital-based learning.

However, research on the use of the unplugged activities method in formal learning in elementary schools is still limited. Research conducted by Syamsiah et al. (2024) shows that unplugged coding education has a significant effect on the computational thinking ability of elementary school students with an asymptotic significance value of < 0.005. However, the research was carried out in the context of non-formal education, namely the learning community, so there are still limitations in its application in the formal school environment. Then, Mufidah and Majid's (2024) research examined the computational thinking approach through Scratch-based coding learning. The results of the study showed a less effective increase based on the N-Gain value < 40%. However, the research still focuses on digital device-based learning, so it has not explored alternative approaches that do not rely on technology. In addition, research by Kirsnawati and Umam (2025) found that unplugged media can improve understanding of computing concepts and affective aspects of students through the PTK approach. However, the study did not use an experimental quantitative design or quasi-experimental design and did not involve a control group. Based on the literature review, there are still some limitations in the previous research. Therefore, further research is needed to test the influence of the unplugged activities method on the computational thinking ability of elementary school students in a more measurable manner.

The main focus of this study was to test how the unplugged activities method combined with the guided inquiry model affects students' computational thinking skills at the elementary school level. In its implementation, this study applied a quasi-experiment method to compare two class groups. The first group is an experimental class that learns using the unplugged activities method, while the second group is a control class that uses the game activities method through a lego game using the same model. This research is expected to make an empirical contribution in supporting the implementation of computational thinking learning that is simpler, easier to apply, and in accordance with the real conditions of elementary schools in Indonesia.

2. Research Methods

This study applied a quantitative approach with quasi-experiments. The selection of a quantitative approach is based on the research objective that aims to test the hypothesis and analyze the impact of an intervention on certain variables through the processing of statistical data. In line with Sugiyono (2013), the quantitative method focuses on the objective measurement of social phenomena by utilizing structured instruments and numerical-based data analysis.

The experimental design used in this study is Non-Equivalent Control Group Design. This design format involves two groups of subjects, namely the experimental group and the control group. The experimental group was given treatment in the form of the implementation of the unplugged activities method combined with a guided inquiry learning model. Meanwhile, the control group received treatment of the game activities method with the same learning model. To identify differences in learning outcomes, both groups were given a pre-test before the intervention began and a post-test after the treatment period ended.

The population in this study is all grade V students in one of the elementary schools in Purwakarta for the 2025/2026 school year. In determining the sample, purposive sampling techniques are applied based on specific criteria, including the equality of students' initial abilities, the relatively same number of students in each class, and recommendations from the school. Based on this technique, a sample of 42 students was obtained, consisting of 21 students in the experimental class and 21 students in the control class. This effort is taken so that the characteristics of the two classes are not too different, so that the results of the research really reflect the influence of the learning method tested.

In the experimental group, learning was carried out using the unplugged activities method, which was integrated with a guided inquiry model. The learning procedure includes stages: (1) problem orientation, the teacher presents contextual problems without digital devices; (2) formulate questions, students are encouraged to identify and formulate questions from the problems presented; (3) data collection, students perform card-based physical activities, games, or manual simulations to explore concepts; (4) data analysis and processing, students discuss findings in groups with the guidance of teachers; and (5) drawing conclusions, students conclude the results of exploration independently. In the control group, learning was carried out using the game activities method with the same learning model, but without the application of unplugged activities.

Data on students' computational thinking ability was collected using a written test instrument in the form of descriptive questions. The preparation of question items refers to four indicators of computational thinking, namely decomposition, pattern recognition, abstraction, and algorithm (Listiaji & Molnar, 2025). The instrument consists of 8 question items developed based on a grid by considering the suitability of indicators, cognitive level, and grade level.

Before being tested on the actual research sample, the test instrument first passes the content validity test through an expert assessment conducted by a classroom teacher who is competent in their field. After being declared feasible, the questions were piloted on students outside the research sample. Based on the results of the trial, all question items showed a level of validity in the range of 0.60–0.79, which means significant, and a range of 0.80–1.00, which means very significant. The instrument's reliability measurement yielded a coefficient of 0.82, which indicates a very high degree of consistency in the category. The difficulty level analysis showed that the distribution of questions was at easy and medium levels, while the results of the differentiating power test confirmed that the question items had sufficient to good qualifications in distinguishing high- and low-ability students.

The collected data was analyzed using inferential statistical techniques. Before conducting the hypothesis test, the researcher first carried out a prerequisite test, namely a normality test and a homogeneity test, to ensure that the data were statistically feasible to be analyzed, which will be discussed further in the data analysis results. Once the assumptions were met, hypothesis testing was performed using an independent t-test to see if there was a significant difference in post-test values between the experimental group and the control group.

3. Results and Discussion

3.1. Results

This section presents the results of data processing and an in-depth review to examine differences in students' abilities between the experimental class and the control class. Before testing the main hypothesis, the data will first be examined using descriptive statistics to get an overview of the results in the field. After that, inferential statistical analysis was carried out using *an independent-samples t-test*. However, before the test is used, the data goes through the prerequisite test stage, which includes the normality test and the homogeneity test. The following are the results of the analysis of *pre-test* and *post-test data*.

Table 1. Results of Descriptive Analysis of Pre-test and Post-test Data

Test Type	Classes	Score		*Mean*
		Min	Max	
Pre-test	Experiment	25	50	34,82
	Control	25	56,25	36,60
Post-test	Experiment	37,50	93,75	63,69
	Control	25	81,25	50,29

Through descriptive statistical analysis, the condition of students' abilities before and after learning in both classes can be mapped as shown in Table 1. The *pre-test* data showed that the experimental class recorded a low score of 25 and a high score of 50, with an average score of 34.82. On the other hand, the control class had an identical minimum score of 25, but the maximum score reached 56.25 with an average of 36.60. These figures indicate that the initial competencies of students in both groups tend to be equal.

After the two classes were given different treatment, there was a noticeable difference in their *post-test* scores. The experimental class experienced a fairly high increase, with students' scores moving from the lowest of 37.50 to the highest, reaching 93.75, with an average score of 63.69. On the other hand, the scores for the control class were only in the range between 25 and 81.25, with an average gain of 50.29.

Table 2. Data Normality Test Results *Pre-test Post-test* Experimental Class and Control Class

Test Type	Classes	*Shapiro-Wilk*			Explanation
		Statistik	df	Sig.	
Pre-test	Experiment	0,877	21	0,013	Not Normally Distributed
	Control	0,922	21	0,094	
Post-test	Experiment	0,974	21	0,821	Normal Distributed
	Control	0,928	21	0,126	

The results of the normality test in Table 2 with the Shapiro-Wilk method show how the data is distributed in each group of students. *The experimental class pre-test* got a significance value of 0.013. Because this number is smaller than 0.05, it means that the experimental-class data does not spread normally. In contrast, the control class gets a significance value of 0.094. Because this number is greater than 0.05, the control class data is declared normal. In conclusion, *the pre-test* data for the two classes did not all meet the normality requirements, so the hypothesis test used *a non-parametric test*, namely the Mann-Whitney U test, which will be described in Table 4.

Meanwhile, for *the post-test data*, the experimental class obtained a significance value of 0.821 and the control class of 0.126. Because these two values are both above 0.05, it means that *the post-test* data for both the experimental class and the control class are normally distributed. In this case, the normality test requirements have been met well in the *post-test data.*

Table 3. Data Homogeneity Test Results *Pre-test Post-test* Experimental Class and Control Class

Test Type	P-*value*	Significance (α)	Interpretation
Pre-test	0,866	0.005	Homogeneous
Postest	0,756	0,005	

Referring to the data presented in Table 3, the homogeneity test process produced a significance value of 0.866 for the initial data (*pre-test*) and 0.756 for the final data (*post-test*). Given that both significance numbers are greater than the 0.05 limit, this is evidence that the variation or diversity of data in the experimental class and the control class is equivalent. Thus, the data from the two groups are homogeneous.

From the results of the prerequisite tests that have been carried out, it was found that *the pre-test* data have not fully spread normally, while *the post-test data* have been proven to be distributed normally. On the other hand, the results of the homogeneity test ensure that the two classes have the same or homogeneous data diversity. Seeing these conditions, the next data analysis will be adjusted to the unique characteristics of each type of data. The following are the results of the analysis of *pre-test* and post-test data:

Table 4. Hypothesis Test Results of Experimental *Class and Control* Class Pre-test Data

Test Type	Classes	Type	Sig (P-Value)	Explanation
Pretst	Experiment	Man-Whitney U	0,537	H_0 Accepted
	Control			
Postest	Experiment	Independent Test T Test	0,004	H_1 Accepted
	Control			

Based on Table 4, the results of the hypothesis test that have been carried out obtained a significance value for *the pre-test* data of 0.537. Since this number is greater than 0.05, H_0 is accepted. This figure proves that there is no real difference between the initial ability of students in the experimental class and the control class. In other words, both groups of students started the study with the same or equivalent level of ability before they were given the treatment.

On the other hand, the *post-test* results showed a significance value of 0.004. Since this value is less than 0.05, H_1 is accepted. This indicates that there is a real and significant difference in learning outcomes between the experimental class and the control class after the learning process is completed. In conclusion, the treatment applied in the experimental class was shown to have a real influence on the improvement of students' abilities when compared to the control class.

3.2. Discussion

Findings in the field show that there is a marked difference in computational thinking skills between the two groups of students. The difference occurred between the experimental class that learned using *the unplugged activities* method and the control class that used *the game activities* method in the form of a LEGO game, although both applied a guided inquiry model. This difference is evident from the final score (*post-test*), where students in the experimental class managed to get higher scores compared to students in the control class.

This is also reinforced by the results of the average score of students in the experimental class, which was higher than that of the control class, increasing from 34.8 in *the pre-test* to 63.6 in the *post-test*, while the control class increased from 36.6 to 50.29. These differences in results show the influence of the application of *the unplugged activities* method with a guided inquiry model on students' computational thinking skills.

The results of *the independent sample t-test* also strengthened this finding with a significance value of 0.004, which means that there is a significant difference between the two classes. In conclusion, the use of *the unplugged activities* method was proven to have a better influence on the computational thinking ability of elementary school students, when compared to control classes that learned using *the game activities* method.

The *unplugged activities* method helps to concretize the concept of computational thinking ability through real activities and is close to students' daily lives, while the guided inquiry model helps direct students' thinking processes to be more systematic in solving problems. So that students are not only physically actively involved in learning, but also trained to use logical thinking skills and problem-solving gradually. This is in line with research by Putri, Suriansyah, & Purwanti, (2023) research, which shows that the use of a combination of learning models and interesting learning activities can increase students' learning activities and motivation so that the learning process becomes more effective and enjoyable. The following is an explanation of the syntax of the guided inquiry model using *the unplugged activity methods*:

a. Problem Orientation

At the orientation stage, teachers build students' learning readiness by presenting contextual problems that are close to students' daily lives through *the unplugged activities method*. This activity can be seen in the activities of compiling shopping lists, making breakfast bread, and sorting garbage, all of which begin with the presentation of stories, video plans, or problem situations that students must solve. In the activity of compiling a shopping list, students were shown the supermarket plan and the shopping situation. In the bread-making activity, students were given problems regarding the steps to prepare breakfast, while in the waste sorting activity, students were faced with environmental problems through a plan of scattered waste locations. The presentation of the problem in a concrete way makes it easier for students to understand the situation being studied so that it is able to foster curiosity and active involvement of students in learning. This is in line with the research of Mebert et al., (2020) which states that real problem-based learning is able to increase student involvement because learning is more relevant, meaningful, and directly related to life and students also become more active in exploring problems and finding solutions to the problems learned. In addition, the research of Chen et al. (2023) also states that *unplugged activities* are able to create active and contextual learning so that it is effective in improving students' computational thinking skills.

b. Formulating the Problem

The problem formulation stage is done when students begin to identify the core of the problem and determine the important parts that must be solved. In the activity of compiling a shopping list, students are asked to determine the initial preparations that must be made before shopping and understand the layout of goods on the supermarket plan. In the bread-making activity, students identify the essential ingredients and steps needed in the breakfast-making process. Meanwhile, in the waste sorting activity, students determine the first steps that must be taken before starting the sorting process. The activity exercises decomposition skills as students learn to break down large problems into smaller, simpler parts. In the stage of formulating this problem, it helps students think more structured in understanding a problem. In accordance with the research of Yuliana, Purwati, & Hanapi, (2022) , which states that the guided inquiry model trains students to think logically in understanding and solving problems systematically and independently.

c. Formulating a Hypothesis

At the stage of formulating a hypothesis, students begin to formulate temporary conjectures or problem-solving strategies before practicing directly. In this stage, students arrange the sequence of shopping steps through sliding puzzle games, determine the steps to make bread, and design a garbage collection path based on the available plan. The activity trains the algorithm's abilities because students must determine logical, sequential, and efficient steps to achieve the desired goal. In addition, students are also trained to consider the best strategies before taking action. This process shows that the *unplugged activities* method can improve computational thinking skills, especially by helping students understand algorithm concepts concretely through fun game and simulation activities. Similarly, Bell & Vahrenhold, (2018) stated that through unplugged activities, students can understand the concepts of decomposition, pattern recognition, abstraction, and algorithm design without dependence on computers or digital devices.

d. Collecting Data

The data collection stage is done when students begin to explore the information needed to solve the problem. In the activity of compiling shopping lists, students observe the supermarket plan to determine the most effective location of goods to reach first. In the bakery activity, students analyze the available ingredients and those that will be used and identify the steps that are repeated repeatedly. Meanwhile, in the waste sorting activity, students observe the position of the waste and determine the most efficient route to the garbage can. In the process, students not only gather information, but also begin to synchronize the results of the observations with the initial hypotheses or strategies they have developed in advance. Students compare whether the planned strategy is in accordance with the real conditions found during the activity. These activities train pattern recognition and abstraction skills because students learn to find important information, recognize order, and ignore information that is not needed in solving problems. Exploration activities carried out directly make students more active in building their own understanding. This is relevant to the research of Sari, Tomuk, & Şentürk, (2026) which states that inquiry-based learning combined with *unplugged computational thinking* is able to develop students' analytical thinking and problem-solving skills because students actively explore and investigate the given problem.

e. Testing the Hypothesis

The hypothesis testing stage is seen when students practice the strategies that have been created and compare them with the results obtained. In the bread making activity, students immediately try the steps that have been prepared using real ingredients. When the results obtained are not correct, students are asked to correct the wrong sequence of steps. The same thing can also be seen in waste sorting activities when students have to re-evaluate the route made if there are still mistakes in the waste collection process. In the activity of compiling shopping lists, students also tested the shopping sequence strategy that had been made through a sliding puzzle game. This process trains *debugging skills*, which is the ability to find and fix errors systematically. Through these activities, students learn to think critically, logically, and not easily give up when the solution made has not been successful. This finding is strengthened by the research of Chen et al., (2023) who explain that *unplugged* activities provide opportunities for students to evaluate and improve problem-solving strategies directly so that students' ability to think logically, solve problems, and correct mistakes develops more optimally.

f. Summing Up the Conclusion

The conclusion stage is carried out when students re-explain the problem-solving process based on the learning experience that has been carried out. After completing the activities of compiling shopping lists, making bread, and sorting garbage, students were asked to convey the steps they had taken and the reasons for choosing a certain strategy. In addition, students learned that problem-solving strategies can be reapplied to other similar situations. The reflection activity helps students build a deeper understanding of the concept of computational thinking. This is in line with the research of Kurniasari et al., (2025) stating that *reflective thinking strategies* are able to improve students' understanding of concepts because students are trained to relate learning experiences to the concepts learned and reinterpret the material using their own understanding.

These findings show that there is a real learning process in students. This is evidenced by the increase in *the post-test* scores of the experimental class, which is directly influenced by the activities they carry out. Therefore, this *method of unplugged activities* has been proven to improve computational thinking skills. Through these activities, students become more active during the learning process, so that their ability to solve problems and think logically can develop to the maximum. In line with that, Oliveira, Vaz-rebelo, & Bidarra, (2025) also stated that the use of *unplugged activities* can improve the four pillars of computational thinking, namely decomposition, pattern recognition, abstraction, and algorithms, through manipulation and game activities that make students more active and engaged in learning. In addition, the guided inquiry model is considered able to improve students' critical thinking and problem-solving skills through a directed investigation process.

Research from Sado, Dakabesi, & Aminatun, (2020) also states that the *guided inquiry model* is effective in improving students' critical thinking and problem-solving skills because students are involved in the investigation process and find solutions in a directed manner. Thus, it can be concluded that the combination of *the unplugged activities* method and the guided inquiry model has a major impact on computational thinking skills. This is because learning is carried out through direct experiences that actively involve students. The guided inquiry model reinforces this process by providing clear direction, so that students' self-exploration remains directed towards achieving targeted computational thinking indicators.

4. Conclusion

This study concludes that the application of the unplugged activities method combined with the guided inquiry model has a significant effect on the computational thinking ability of elementary school students. This is evidenced by the results of the *independent sample t-test,* which produced a significance value of 0.004, smaller than the significance level of 0.05. These findings show that there is a significant difference in achievement between the experimental group that used the unplugged activities method based on guided inquiry and the control group that used *the game activities* method. Thus, the purpose of this study in testing the influence of *the unplugged activities* method combined with guided inquiry on students' computational thinking skills has been proven to be influential, with a significance value of less than 0.05 in the results of *the independent-samples t-test* on *post-test data*.

These findings have important implications for learning practices in elementary schools. The unplugged activities method has proven to be an effective learning strategy for developing computational thinking skills without the need for digital devices, so it can be widely applied, including in schools with limited technological facilities. On the other hand, the guided inquiry model successfully facilitates students in actively learning, honing critical reasoning, and building understanding through the experience of finding solutions independently or collaboratively. The combination of the two not only has an impact on computational thinking skills, but also has the potential to sharpen the high-level thinking skills that are so much needed in the 21st century. Therefore, primary school teachers are advised to consider applying this combination of approaches, especially in learning that requires students to think logically, sequentially, and systematically.

For further research, it is suggested that it be possible to explore the influence of the unplugged activities method on other variables such as learning motivation, problem-solving ability, or students' creative thinking ability.

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