

Using Smart Box Media to Improve IPAS Learning Outcomes on the Environmental Care Topic among Grade IV Students at an Islamic Primary School

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Abstract. This study was motivated by the low learning outcomes of students in the Natural and Social Sciences (IPAS) subject specifically regarding the "Environmental Care" topic at Nurul Hidayah Sungai Bengkal (Grade IV). Instruction was predominantly lecture-based, resulting in students who were passive and unmotivated, and who struggled to grasp concepts related to environmental conservation. One alternative to address this issue is the use of "Smart Box" learning media an interactive, box-shaped tool containing various cards, images, questions, and activities that allow students to learn through play. This study aims to improve IPAS learning outcomes by implementing the Smart Box medium for the "Environmental Care" topic. The research employed the Classroom Action Research (CAR) method based on the Kemmis and McTaggart model, comprising two cycles. Each cycle consisted of planning, action implementation, observation, and reflection stages. The research subjects were 25 fourth-grade students at Nurul Hidayah Sungai Bengkal. Data collection techniques included learning outcome tests, observation, documentation, and field notes. Data were analyzed using descriptive statistics, specifically by calculating average scores and the percentage of learning mastery. The results indicate that the implementation of the Smart Box medium successfully improved student learning outcomes incrementally. Beyond boosting academic scores, the Smart Box medium also enhanced student engagement, cooperation, motivation, and participation during the learning process. Improvements in learning outcomes were evident in the students' average scores across the various research stages. In the pre-cycle stage, the average score was 62,40, falling below the Minimum Mastery Criterion of 70. Following the implementation of the Smart Box medium in Cycle I, the average score rose to 73,60. In Cycle II, the average score increased further to 84,80. These results demonstrate a significant improvement from the pre-cycle stage to Cycle II. Thus, the Smart Box medium serves as an effective alternative for improving IPAS learning outcomes regarding "Environmental Care" in primary schools.

Keywords: *Smart Box, learning outcomes, IPAS, environmental care, Classroom Action Research.*

A. INTRODUCTION

Education is a process designed to develop students' potential so that they can think, behave, and act in ways that align with national education goals (Junaedi, 2019). Under the current Merdeka Curriculum, school learning is oriented not only toward the acquisition of knowledge but also toward character formation, skill development, and meaningful problem-solving. Therefore, educators are responsible for creating active, innovative, creative, and effective learning environments that students can understand and enjoy, enabling them to participate optimally in the learning process (Nopia et al., 2026).

This is consistent with the important role of Natural and Social Sciences (IPAS) in the Merdeka Curriculum. IPAS integrates natural sciences and social sciences and aims to develop scientific thinking while fostering students' concern for the environment and their ability to engage with the communities in which they live (Utami & Utari, 2025). IPAS learning requires students to understand concepts, observe phenomena, investigate, communicate their observations, and apply knowledge in everyday life (Purnawati & Yakin, 2025). One important topic for Grade IV is Environmental Care. This topic is expected to foster students' awareness of the importance of protecting and preserving the environment,

including managing waste properly and adopting environmentally friendly habits at home and at school (Nugroho, 2022). Through this topic, students are expected not only to understand concepts theoretically but also to apply them in daily life as a form of environmental responsibility.

In practice, IPAS instruction in primary schools continues to face various challenges. Learning is sometimes teacher-centered, leaving students as passive recipients of information (Nirwana et al., 2024). Teachers tend to rely on lectures and textbooks as the main learning resources and do not always make effective use of engaging instructional media. This can cause students to become bored and less active in discussions, make them reluctant to express their opinions, and create difficulties in understanding concrete and contextual (Ayshara & Kamil, 2025).

Initial observations in Grade IV at Nurul Hidayah Sungai Bengkal indicated that students' learning outcomes in IPAS, particularly on the Environmental Care topic, were not yet optimal. Some students could not explain how to protect the environment; some still littered, could not distinguish between organic and inorganic waste, or struggled to explain the benefits of environmental conservation. Students' learning motivation was also low because instruction was monotonous and provided few engaging learning activities. Consequently, some students scored below the school's Minimum Mastery Criterion (KKM), which was set at 70. These problems indicate that teachers need to innovate in their teaching so that students become more active and motivated. One possible alternative is Smart Box media.

Smart Box is an interactive, box-shaped learning medium containing picture cards, questions, educational games, puzzles, and other learning activities designed to meet instructional objectives. It encourages students to learn through exploration, making learning more engaging, enjoyable, and meaningful (Gita et al., 2025).

Smart Box offers several advantages. First, its appealing visual presentation attracts students' attention. Second, students can participate actively through learning-by-playing activities. Third, it encourages collaboration through group discussions. Fourth, it helps teachers present abstract concepts in a more concrete form, making them easier for students to understand (Qayyimah, 2025).

Previous studies indicate that interactive learning media can improve learning outcomes, motivation, and student engagement. However, much of the existing research has focused on picture-based media, digital educational games, or interactive multimedia. Studies specifically examining Smart Box media in IPAS learning on the Environmental Care topic in Islamic primary schools remain relatively limited. Further investigation is therefore needed into the effectiveness of Smart Box media in improving IPAS learning outcomes at this level. The novelty of this study lies in using Smart Box as interactive learning media integrated with the Environmental Care topic in Grade IV IPAS. The media functions not only as a tool for presenting material but also as a means of promoting active learning through educational games, problem-solving, and group work suited to primary-school students.

Based on this background, the researcher conducted Classroom Action Research (CAR) entitled "The Use of Smart Box Media to Improve IPAS Learning Outcomes on the Environmental Care Topic among Grade IV Students at Nurul Hidayah Sungai Bengkal." This study is expected to offer a solution to low student learning outcomes and provide an innovative alternative for improving the quality of IPAS instruction in Islamic primary schools.

B. METHOD

This study employed Classroom Action Research (CAR), which involves a series of actions intended to improve the quality of the learning process and students' learning outcomes. The study followed the Kemmis and McTaggart model, consisting of four stages: (1) planning, (2) action, (3) observation, and (4) reflection. (Agustin & Dewi, 2025) These stages were carried out repeatedly over two cycles until the research success criterion was achieved. The study was conducted at Nurul Hidayah Sungai Bengkal during the second semester of the 2026/2027 academic year.

The study lasted approximately one month, including preparation, implementation of the actions in each cycle, and preparation of the research report. The participants were all 25 Grade IV students at Nurul Hidayah Sungai Bengkal. Grade IV was selected because initial observations showed that students' IPAS learning outcomes on the Environmental Care topic had not reached the expected level. Students also needed learning media that could improve motivation, engagement, and conceptual understanding more effectively. The object of the study was the use of Smart Box media in IPAS learning on the Environmental Care topic to improve the learning outcomes of Grade IV students at Nurul Hidayah Sungai Bengkal. The study was conducted in two cycles. The data were analyzed using descriptive statistics to describe students' learning outcomes by calculating the mean score and the percentage of students achieving mastery in each cycle siklus. (SP & Kusmariyatni, 2019)

1. Mean Score

$$\bar{X} = \frac{\sum X}{N}$$

Where:

$\bar{X}$ = mean score

$\sum X$ = sum of all students' scores

N = number of students

2. Learning Mastery Percentage

$$P = \frac{f}{N} \times 100\%$$

Where:

P = percentage of learning mastery

f = number of students scoring $\geq$ the Minimum Passing Grade

N = total number of students

The results were then classified according to the following criteria.

Table 1. Learning Mastery Criteria

Mastery Percentage	Category
86–100%	Very Good
76–85%	Good
60–75%	Fair
55–59%	Poor
<55%	Very Poor

If the indicator is achieved by the end of Cycle II, the study is considered successful when at least 85% of students obtain scores ≥ 70 . In that case, no further cycle is required.

C. RESULT AND DISCUSSION

This classroom action research was conducted in grade IV at Nurul Hidayah Sungai Bengkal with 25 students. The study consisted of two cycles, each comprising planning,

action, observation, and reflection. The topic taught was environmental care in IPAS, using smart box as the learning medium.

1. Pre-cycle results

The pre-cycle stage was conducted to determine students' initial learning outcomes before smart box media was introduced. Instruction relied on lectures, question-and-answer sessions, and assignments, which tended to leave students passive. Most students listened to the teacher without actively participating in the learning process. The initial test produced a class mean score of 62.40, below the school's Minimum Passing Grade of 70. Eleven students (44%) achieved the Minimum Passing Grade, while 14 (56%) did not. Student learning outcomes were analyzed using descriptive statistics, including the mean score and learning mastery percentage. The results at each stage are presented below:

Table 2. Students' Learning Outcomes in the Pre-Cycle

Description	Result
Number of students	25
Highest score	82
Lowest score	45
Mean score	62,40
Students achieving mastery	11
Students not achieving mastery	14
Mastery percentage	44%

As shown in table 2, the mean learning outcome score in the pre-cycle was 62.40, with a mastery rate of 44%. This indicates that most students had not achieved the Minimum Passing Grade, making improvement through smart box media necessary. The results show that IPAS instruction was not yet optimal. Therefore, smart box media was introduced to encourage more active participation and improve learning outcomes.

2. Results of cycle I

A. Planning

During the planning stage, the researcher prepared the teaching module, smart box media, student worksheets, teacher and student observation instruments, and end-of-cycle assessment questions.

A. Action Implementation

The action was implemented according to the planned learning procedures using smart box media. The teacher explained the learning objectives, introduced the smart box, and divided the students into five groups. Each group selected cards from the smart box. The cards contained pictures, questions, and case studies related to environmental care. Students discussed their answers together and then presented their group's findings to the class. The teacher provided feedback and reinforcement before the assessment activity.

B. Observation Results

The observations showed that smart box media began to increase student engagement. Students appeared enthusiastic about the educational games, discussed tasks with their groups, and became more willing to express their opinions. However, some students were still not confident when presenting their group's findings and continued to need teacher guidance. The teacher's activities were carried out well in accordance with the planned procedures. The teacher managed the class, encouraged students, and guided them while they used the smart box.

C. Cycle I Test Results

The assessment results improved compared with the pre-cycle stage. The class mean score increased to 73,60. Eighteen students (72%) achieved the Minimum Passing Grade, while seven students (28%) had not yet achieved mastery.

Table 3. Students' Learning Outcomes in Cycle I

Description	Result
Number of students	25
Highest score	90
Lowest score	55
Mean score	73,60
Students achieving mastery	18
Students not achieving mastery	7
Mastery percentage	72%

Table 3 shows that the mean learning outcome score in cycle i was 73.60, with a mastery rate of 72%. This indicates an improvement in student learning outcomes, but the result did not yet meet the researcher's success target of at least 85% of students scoring ≥ 70 . Therefore, improvements were needed in cycle II through the use of smart box media.

D. Reflection on Cycle I

The reflection stage identified the following findings:

1. Smart box media helped increase students' learning motivation.
2. Most students began participating more actively in discussions.
3. The teacher still needed to guide students who lacked confidence.
4. Discussion time management needed to be improved so that every group had an equal opportunity to present its findings.

These Reflections Provided the Basis for Improving the Actions in Cycle II.

3. Results Of Cycle II

A. Planning

Planning for cycle II was based on the reflections from cycle I. The teacher improved time management, provided clearer instructions for using the smart box, added a wider variety of challenge cards, and rewarded active groups.

B. Action Implementation

Learning was more orderly than in the previous cycle. Students had become familiar with using the smart box, allowing discussions to proceed more effectively. The teacher gave every group an equal opportunity to present its findings and provided feedback on students' answers.

C. Observation Results

The observations showed that nearly all students participated actively in the learning activities. They collaborated in groups, asked and answered questions, and summarized the lesson effectively. Teacher performance also improved, particularly in classroom management and providing reinforcement.

D. Cycle II Test Results

The cycle II assessment showed further improvement over cycle I. The class mean score increased to 84.80. Twenty-three students (92%) achieved the kkm, while two students (8%) still required additional guidance.

Table 4. Students' Learning Outcomes in Cycle II

Description	Result
Number of students	25
Highest score	100
Lowest score	65
Mean score	84,80
Students achieving mastery	23
Students not achieving mastery	2
Mastery percentage	92%

As shown in table 4, the mean learning outcome score in cycle ii was 84.80, with a mastery rate of 92%. The mastery rate exceeded the research target. Thus, smart box media for environmental care is a viable and effective learning medium for improving student learning outcomes in primary schools.

E. Reflection on Cycle II

The reflection results indicated that the use of smart box media had met the research success criterion. Students' learning outcomes, motivation, and engagement improved during the learning process. The teacher managed the lesson effectively using smart box media, creating a more enjoyable and interactive learning environment.

Because the success criterion had been achieved, the study was concluded after cycle II.

4. Summary of Improvements in Learning Outcomes

Table 5. Summary of Students' Learning Outcomes

Stage	Mean	Mastery
Pre-cycle	62,40	44%
Cycle I	73,60	72%
Cycle II	84,80	92%

The table shows that students' mean learning outcome scores increased progressively, from 62,40 in the pre-cycle stage to 73,60 in cycle I and 84,80 in cycle II. This improvement indicates that using smart box media was effective in improving grade IV students' IPAS learning outcomes on the environmental care topic at Nurul Hidayah Sungai Bengkal.





Figure 1. Smart Box Media for Environmental Care

The findings show that the use of Smart Box media improved Grade IV students' learning outcomes in IPAS on the Environmental Care topic at MI Nurul Hidayah Sungai Bengkal. This improvement is reflected in the mean scores across the research cycles: 62,40 in the pre-cycle stage, 73,60 in Cycle I, and 84,80 in Cycle II. These results indicate that Smart Box media had a positive impact on both the learning process and learning outcomes.

The improvement in learning outcomes is closely related to the characteristics of Smart Box media, which can create an active, enjoyable, and student-centered learning environment. Rather than simply receiving information from the teacher, students directly participated by observing pictures, reading question cards, discussing ideas, solving problems, and presenting group findings. These activities provided more meaningful learning experiences and helped students understand environmental-care concepts.

At the initial stage (pre-cycle), learning was still dominated by lectures. The teacher was the main source of information, while students tended to remain passive and listen to explanations. This situation reduced learning motivation and made the material difficult for some students to understand. As a result, the mean learning outcome score remained below the school's Minimum Mastery Criterion of 70.

After Smart Box media was introduced in Cycle I, the classroom atmosphere began to change. Students showed considerable enthusiasm when using the Smart Box. Learning became more interactive as students worked in groups to complete tasks on the cards inside the box. Group discussions allowed them to exchange opinions, develop their thinking skills, and arrive at answers collaboratively. These changes contributed to an increase in the mean learning outcome score to 73,60.

Nevertheless, reflection on Cycle I identified several challenges. Some students lacked confidence when presenting their group's findings, and lesson time was not yet managed optimally. Accordingly, several improvements were made in Cycle II, including clearer instructions for using the media, a more equitable distribution of group tasks, better time management, and encouragement and rewards for active participation.

The improvements implemented in Cycle II produced better results. Students became more familiar with the Smart Box, allowing learning activities to run more smoothly. They were more active in asking and answering questions, expressing opinions, and collaborating in groups. The teacher also found classroom management easier because students were actively involved throughout the lesson. Consequently, the mean learning outcome score rose to 84.80, exceeding the established success criterion.

The improvement in learning outcomes suggests that Smart Box media increased students' involvement in the learning process. According to constructivist learning theory, knowledge is more easily understood when students construct their own understanding through concrete learning experiences. In this study, students gained such experiences by

observing, discussing, answering questions, and completing challenges presented in the Smart Box. Learning therefore went beyond memorization and supported conceptual understanding.

These findings are also consistent with experts' views that instructional media help clarify information, attract students' attention, and create more engaging and meaningful learning experiences. Media suited to the characteristics of primary-school students can improve motivation, facilitate conceptual understanding, and contribute to better learning outcomes.(Uno, 2014). In addition to improving learning outcomes, Smart Box media positively affected students' learning activities. During lessons, students appeared more enthusiastic, more willing to express their opinions, more active in discussions, and better able to collaborate than before the intervention. This suggests that Smart Box serves not only as an instructional aid but also as a medium for developing students' social, communication, and collaboration skills.

This study reinforces previous findings that interactive learning media can improve the quality of the learning process and student learning outcomes. Its contribution, however, lies in applying Smart Box media to IPAS learning on the Environmental Care topic in an Islamic primary school. Smart Box was designed as an activity-based medium integrating educational games, group discussion, and problem-solving, making it appropriate for primary-school students and supportive of the student-centered approach promoted by the Merdeka Curriculum. (Yunita et al., 2023)

Overall, the findings indicate that Smart Box media can create a more active, interactive, and enjoyable learning process. The increase in mean learning outcome scores from 62,40 in the pre-cycle stage to 73,60 in Cycle I and 84,80 in Cycle II demonstrates that Smart Box media is effective in improving Grade IV students' IPAS learning outcomes on the Environmental Care topic at Nurul Hidayah Sungai Bengkal. Smart Box can therefore serve as an innovative alternative for improving the quality of IPAS instruction in primary schools and Islamic primary schools.

D. CONCLUSION

Based on the Classroom Action Research conducted with Grade IV students at Nurul Hidayah Sungai Bengkal in IPAS on the Environmental Care topic, the use of Smart Box media improved student learning outcomes. This improvement is evident in the mean scores at each stage: 62,40 in the pre-cycle stage, below the Minimum Passing Grade of 70. 73,60 in Cycle I after Smart Box media was introduced; and 84,80 in Cycle II. These results demonstrate a substantial improvement from the pre-cycle stage to Cycle II.

In addition to improving learning outcomes, Smart Box media increased students' engagement, motivation, collaboration, and participation during lessons. Students became more enthusiastic because Smart Box provided engaging, interactive, and enjoyable learning experiences through discussions, educational games, and problem-solving activities. Therefore, Smart Box media was effective for teaching IPAS on the Environmental Care topic to Grade IV students at Nurul Hidayah Sungai Bengkal. It can be used as an innovative alternative to support student-centered learning in line with the Merdeka Curriculum.

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