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Deep Learning to Improve IPAS Motivation and Learning Outcomes for Grade III Students

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Abstract

Traditional teacher-centered instruction in IPAS often leads to low student motivation and suboptimal learning outcomes, necessitating a shift toward more active and meaningful pedagogical strategies. This study aims to implement a deep learning approach to enhance both motivation and academic achievement among 20 third-grade students at SDN Sidomulyo 2. Using Classroom Action Research (CAR) based on the Kemmis and McTaggart model across two cycles, data were collected through observations, questionnaires, and tests. The findings revealed a substantial increase in student motivation from a pre-cycle average of 59.72% to 85.14% in Cycle II. Similarly, the average learning score improved from 66.50 to 86.80, while classical completeness soared from 30% to 100% by the end of the intervention. It is concluded that the deep learning approach, which effectively incorporates mindful, meaningful, and joyful learning principles, is highly successful in fostering student engagement and significantly improving the academic performance of elementary school students in IPAS subjects.

Keywords Deep Learning, IPAS, Learning Outcomes, Motivation.

INTRODUCTION

Education plays a fundamental role in developing high-quality human resources and serves as the cornerstone of national development. In the twenty-first century, education is expected not only to transfer knowledge but also to develop students' critical thinking, creativity, collaboration, communication, and problem-solving skills to prepare them for increasingly complex global challenges (Kurniawati et al., 2019a; Nursaya'bani et al., 2025a; Pamungkas, 2025a; Pare & Sihotang, 2023a). According to the Indonesian National Education System Law No. 20 of 2003, education is a conscious and planned effort to create learning environments that enable students to actively develop their potential, including spiritual, intellectual, personal, and social competencies. Therefore, improving the quality of learning has become one of the primary concerns in educational reform (Farikha & Minarti, 2026; Rambe et

al., 2024; Rosdiana et al., 2024).

One of the recent educational innovations that has attracted considerable attention is the implementation of the Deep Learning approach. In the educational context, Deep Learning refers to a learning approach that emphasizes meaningful understanding rather than rote memorization (Habibah et al., 2026a; Nadawina et al., 2025a; Prawiyogi & Rosalina, 2025a). This approach encourages students to actively construct knowledge, connect new concepts with prior experiences, think critically, reflect on their understanding, and apply knowledge in authentic situations (Panca & Parisu, 2025a). Unlike conventional teacher-centered instruction, Deep Learning positions students as active participants who continuously build conceptual understanding through exploration, discussion, and reflection (Anwar & Sodik, 2025; Fatmawati & Prasetyo, 2026a; Hidayat et al., 2025a). Consequently, this approach is considered capable of promoting higher-order thinking skills and competencies required in the twenty-first century (Daga, 2022).

The importance of Deep Learning has become increasingly relevant following the issuance of the Indonesian Ministry of Primary and Secondary Education Regulation (Permendikdasmen) No. 13 of 2025, which formally integrates the Deep Learning approach into the national curriculum framework. This policy emphasizes meaningful, enjoyable, and competency-based learning through the integration of the eight dimensions of the Graduate Profile (Kabatiah et al., 2026). The reform aims to develop students who possess strong character, critical thinking, creativity, collaboration, and adaptability to rapid technological and social changes (Ar & Ismail, 2024; Rahim & Ismaya, 2023; Rismana & Hernawati, 2025). Consequently, teachers are expected to implement learning approaches that actively engage students in constructing knowledge rather than merely receiving information (Arrosyad et al., 2024a; Dahlan et al., 2025).

At the elementary school level, Natural and Social Sciences (Ilmu Pengetahuan Alam dan Sosial, IPAS) is one of the essential subjects designed to develop scientific literacy, environmental awareness, social understanding, and problem-solving abilities (Zakarina et al., 2024). However, many elementary school students continue to experience difficulties in understanding IPAS concepts because learning activities remain dominated by teacher-centered instruction and memorization-oriented practices. Previous studies have consistently reported that passive learning environments reduce students' learning motivation and limit conceptual understanding, ultimately affecting academic achievement (Amrulloh et al., 2024; Paradipa & Lestari, 2026; Purnomo et al., n.d.). These findings indicate the necessity of implementing more meaningful learning approaches that encourage students to participate actively in constructing knowledge (Kasi, 2023; Nurdiniah et al., 2024a).

Preliminary observations conducted in Grade III of SDN Sidomulyo 2, Puncu District, Kediri Regency, revealed similar conditions. Students demonstrated low motivation during IPAS learning, characterized by limited classroom participation, low enthusiasm, and minimal involvement in classroom discussions and inquiry activities. Among 20 students, only eight students (40%) demonstrated high learning motivation. Likewise, students' academic

achievement remained below expectations. Based on the school's Minimum Mastery Criterion (Kriteria Ketuntasan Minimal, KKM) of 75 for the 2025/2026 academic year, only seven students (35%) successfully achieved the expected competency level. Classroom observations further indicated that learning activities were predominantly conducted through lectures and individual assignments, providing limited opportunities for students to explore concepts, reflect on learning experiences, or solve authentic problems.

Administrative responsibilities and additional workloads also constrained teachers in designing more innovative learning experiences (Kasi, 2023; Musa & Kompri, 2026; Rosyada et al., 2024). Although previous studies have demonstrated the positive impact of Deep Learning on students' conceptual understanding, critical thinking, and learning engagement (Komara et al., 2026a; Zafirah et al., 2025a), empirical evidence regarding its implementation in Indonesian elementary IPAS classrooms, particularly through Classroom Action Research (CAR), remains limited. Moreover, few studies have simultaneously investigated the effects of the Deep Learning approach on both students' learning motivation and learning outcomes within the context of the recently implemented national curriculum reform. Therefore, this study aims to improve students' learning motivation and learning outcomes through the implementation of the Deep Learning approach in IPAS learning for Grade III students at SDN Sidomulyo 2, Puncu District, Kediri Regency. The findings are expected to provide empirical evidence regarding the effectiveness of the Deep Learning approach in elementary education and offer practical recommendations for teachers in designing meaningful, student-centered learning aligned with the current educational reform. Furthermore, this study contributes to expanding the body of knowledge concerning the implementation of Deep Learning in Indonesian elementary schools and supports the realization of competency-based education envisioned by the national curriculum.

METHODS

This study employed Classroom Action Research (CAR) using a mixed-method approach, combining qualitative and quantitative data to obtain a comprehensive understanding of the implementation of the Deep Learning approach in improving students' motivation and learning outcomes. The qualitative approach was used to describe the learning process, students' participation, and teacher implementation during classroom activities, whereas the quantitative approach was used to measure changes in students' learning motivation and academic achievement through observation scores and learning outcome tests. The research was conducted at SDN Sidomulyo 2, Puncu District, Kediri Regency, Indonesia, from September 2025 to March 2026. The participants consisted of 20 third-grade students (15 boys and 5 girls), the classroom teacher who acted as the researcher, and two collaborators (a fellow teacher and the school principal) who assisted in classroom observations and reflections.

The study followed the Kemmis and McTaggart Classroom Action Research model, which consists of four recurring stages: planning, action, observation, and reflection. Two

action cycles were implemented, with each cycle consisting of one learning meeting. During the planning stage, the researcher identified classroom problems, prepared lesson plans, learning materials, student worksheets, observation sheets, and assessment instruments based on the Deep Learning approach. The action stage involved implementing Deep Learning-based IPAS instruction. Simultaneously, classroom observations were conducted to monitor students' motivation and teacher performance. Finally, the reflection stage evaluated the implementation results and determined necessary improvements before proceeding to the subsequent cycle.

Data were collected using three complementary techniques to ensure data triangulation. First, participant observation was conducted to examine students' learning motivation, classroom participation, and the implementation of the Deep Learning approach. Observation indicators included students' attention, participation, learning interest, independence, and teacher instructional practices using a four-point Likert scale accompanied by qualitative field notes. Second, documentation was used to collect supporting evidence, including lesson plans, students' worksheets, photographs, videos, and classroom records. Third, learning achievement tests consisting of multiple-choice and essay questions were administered before and after each action cycle to evaluate students' cognitive achievement in IPAS. These multiple sources of evidence enhanced the credibility and trustworthiness of the research findings through methodological triangulation.

The collected data were analyzed using descriptive quantitative and qualitative techniques. Quantitative data from students' learning achievement tests were analyzed by calculating the class mean score and comparing the results across the pre-action, Cycle I, and Cycle II stages to determine learning improvement. Students were considered successful if the class average reached the Minimum Mastery Criterion (KKM) of 75 and at least 75% of students achieved mastery. Observation scores describing students' motivation and teacher implementation were converted into percentage scores and categorized according to predetermined performance criteria. Qualitative data obtained from classroom observations, field notes, and documentation were analyzed using the interactive model of data reduction, data display, and conclusion drawing throughout the research process. The integration of quantitative and qualitative findings provided comprehensive evidence regarding the effectiveness of the Deep Learning approach in improving students' motivation and learning outcomes.

FINDINGS AND DISCUSSION

Findings

This classroom action research was conducted in Grade III of SDN Sidomulyo 2, Puncu District, Kediri Regency, involving 20 students. The research was implemented in two cycles following the stages of planning, action, observation, and reflection. Data were collected through classroom observation, motivation questionnaires, learning achievement tests, interviews with the collaborating teacher, and documentation of learning activities. The

intervention integrated the three principles of the Deep Learning approach: mindful learning, meaningful learning, and joyful learning.

Implementation of the Deep Learning Approach

During the pre-cycle stage, IPAS instruction was predominantly teacher-centered. Learning activities relied mainly on lectures and individual assignments, while students had limited opportunities to explore ideas, discuss problems, connect concepts with their daily experiences, or reflect on their learning.

In Cycle I, the Deep Learning approach was implemented through several activities. Mindful learning was facilitated through short breathing exercises, essential questions, and focused observation of audiovisual learning materials. Joyful learning was implemented through the "Mencari Harta Karun" activity, in which students worked in groups to locate objects by following a school map. Meaningful learning was encouraged by asking students to draw simple maps of their homes and explain the practical functions of maps in everyday life.

The observation results indicated that the implementation of Deep Learning by the teacher reached 65% in Cycle I, categorized as sufficient. Several weaknesses were identified, particularly unequal student participation, limited reflection time, inadequate group guidance, and insufficient connections between the learning materials and students' real-life experiences.

Improvements were subsequently introduced in Cycle II. The students were assigned specific roles as group leaders, note-takers, presenters, and questioners. The exploration period was extended, contextual materials related to Sidomulyo Village were used, and the teacher provided structured guidance to each group. As a result, the implementation score increased to 95%, categorized as very good.

Table 1. Implementation of the Deep Learning Approach

Research stage	Implementation percentage	Category
Cycle I	65%	Sufficient
Cycle II	95%	Very good
Increase	30 percentage points	—

Source: Research Data (2026)

The findings demonstrate that the instructional process improved substantially after revisions were made based on the reflection conducted at the end of Cycle I.

Improvement in Students' Learning Motivation

Students' learning motivation was measured through twelve indicators grouped into four aspects: attention, participation, interest, and learning independence. The pre-cycle results showed that the average motivation score was 21.50 out of a maximum score of 36, equivalent to 59.72%. Only three students, or 15%, were classified as having high learning motivation.

Following the implementation of Deep Learning in Cycle I, the average motivation score increased to 26.65 or 74.03%. Nine students, or 45%, were categorized as having high motivation, while no student remained in the low-motivation category. However, this result had not yet reached the predetermined success criterion, namely at least 80% of students attaining the high-motivation category.

In Cycle II, the average motivation score increased to 30.65 or 85.14%. Eighteen students, or 90%, attained the high-motivation category, while the remaining two students were in the moderate category. Thus, the success indicator for learning motivation was achieved.

Table 2. Development of Students' Learning Motivation

Indicator	Pre-cycle	Cycle I	Cycle II
Average motivation score	21.50	26.65	30.65
Percentage of maximum score	59.72%	74.03%	85.14%
Students in high category	3 students (15%)	9 students (45%)	18 students (90%)
Students in moderate category	13 students (65%)	11 students (55%)	2 students (10%)
Students in low category	4 students (20%)	0 students (0%)	0 students (0%)

Source: Research Data (2026)

Overall, the average motivation score increased by 9.15 points, or 25.42 percentage points, from the pre-cycle stage to Cycle II. The classroom observations also showed behavioral changes. Students became more attentive to learning materials, more willing to ask and answer questions, more actively involved in group discussions, and more independent in completing learning tasks.

Improvement in Students' Learning Outcomes

Students' learning outcomes were measured using written tests administered during the pre-cycle stage, Cycle I, and Cycle II. The Minimum Mastery Criterion was set at 75. In the pre-cycle stage, the class average was 66.50. Only six students, or 30%, achieved the Minimum Mastery Criterion, while fourteen students, or 70%, had not yet achieved mastery. These findings indicated that the initial learning outcomes were below the expected level.

After the implementation of Deep Learning in Cycle I, the class average increased to 78.25. Sixteen students, or 80%, achieved mastery. Although this represented a considerable improvement, the result had not reached the classical mastery criterion of 85%. In Cycle II, the class average increased further to 86.80. All twenty students, or 100%, achieved the Minimum Mastery Criterion. Therefore, the criterion for successful classroom action was attained.

Table 3. Development of Students' IPAS Learning Outcomes

Indicator	Pre-cycle	Cycle I	Cycle II
Class average	66.50	78.25	86.80
Students achieving mastery	6 students (30%)	16 students (80%)	20 students (100%)
Students not achieving mastery	14 students (70%)	4 students (20%)	0 students (0%)
Minimum Mastery Criterion	75	75	75

Source: Research Data (2026)

The average score increased by 11.75 points from the pre-cycle stage to Cycle I and by another 8.55 points from Cycle I to Cycle II. Overall, the class average increased by 20.30 points. Classical mastery also increased by 70 percentage points, from 30% to 100%

Discussion

The Implementation of Deep Learning in IPAS Instruction

The teacher's implementation score increased from 65% in Cycle I to 95% in Cycle II. This result indicates that Deep Learning can be applied effectively in elementary IPAS instruction when supported by systematic planning, observation, reflection, and instructional revision. The main improvement occurred after the teacher addressed the weaknesses identified in Cycle I.

In Cycle I, students responded positively to audiovisual materials and map-based games. However, participation in group discussions remained uneven. Several active students dominated the activities, while quieter students contributed less. In Cycle II, each group member was assigned a specific role as leader, recorder, presenter, or questioner. This strategy created clearer responsibilities and more equal participation. The finding supports Nurdiniah et al. (2024b), who emphasize the teacher's role in organizing active and inclusive student participation.

Deep Learning requires students to construct understanding actively rather than only receive information. Students are expected to connect new concepts with prior knowledge and apply them in meaningful contexts. In this study, map-making activities helped students understand directions, symbols, routes, and spatial locations through familiar experiences. This finding is consistent withPrawiyogi & Rosalina (2025b), who explain that Deep Learning in elementary education emphasizes conceptual understanding, active engagement, and real-life connections. The three Deep Learning principles performed complementary functions. Mindful learning strengthened attention and learning awareness. Meaningful learning connected IPAS concepts with students' everyday environments. Joyful learning created positive experiences through games, exploration, teamwork, and presentations. Habibah et al. (2026b) similarly state that mindful, meaningful, and joyful learning should be integrated to create an in-depth learning experience.

The findings also support Panca & Parisu (2025b), who found that Deep Learning can improve elementary students' critical-thinking skills, and Komara et al. (2026b), who

concluded that it strengthens conceptual understanding, higher-order thinking, and learning quality. The present study adds evidence from Grade III students through classroom action research. It also shows that Deep Learning does not require expensive technology. School grounds, village maps, houses, fields, places of worship, roads, and familiar landmarks can serve as meaningful learning resources.

The Effect of Deep Learning on Learning Motivation

The proportion of students with high motivation increased from 15% in the pre-cycle stage to 90% in Cycle II. This improvement was reflected in attention, participation, interest, and independence. Mindful learning strengthened students' attention through breathing exercises, essential questions, and focused observation. These activities prepared students mentally before the lesson and encouraged them to notice, question, and think about the topic. Meaningful learning increased interest because the material was connected to students' daily lives. Students created maps of their homes, identified landmarks, described routes to school, and explained the functions of maps. Nadawina et al. (2025b). similarly emphasize that Deep Learning becomes effective when students connect new knowledge with experience and apply it in real situations. Joyful learning increased participation through games, movement, collaboration, and presentations. The "Mencari Harta Karun" activity and explorer game created enthusiasm and reduced the perception that IPAS was difficult or based mainly on memorization. This result supports Arrosyad et al. (2024b), who found that active and innovative learning methods can increase elementary students' interest.

The findings are also consistent with Sardiman's view that motivated students demonstrate interest, persistence, independence, and active involvement. They support Uno's explanation that motivation emerges from internal and external encouragement. In this study, meaningful tasks strengthened internal motivation, while games, group interaction, media, and teacher feedback provided external support. Fatmawati & Prasetyo (2026b) also found that Deep Learning can increase students' interest in IPAS through relevant and enjoyable learning experiences.

The results can also be interpreted through Self-Determination Theory. Students gained autonomy through individual map-making, competence through authentic tasks, and social relatedness through group work. These conditions strengthened intrinsic motivation. However, motivation did not increase immediately. In Cycle I, only 45% of students reached the high category. The major improvement in Cycle II occurred after the teacher strengthened group roles, guidance, reflection time, and contextual learning materials. This shows that the motivational effect of Deep Learning depends on the quality of lesson design and inclusive participation.

The Effect of Deep Learning on Learning Outcomes

The class average increased from 66.50 in the pre-cycle stage to 78.25 in Cycle I and 86.80 in Cycle II. Classical mastery also increased from 30% to 80% and finally reached 100%. These results indicate that Deep Learning was effective in improving IPAS learning outcomes. The improvement occurred because students were given opportunities to understand, apply,

and reflect on the material. They observed maps, analyzed symbols, followed directions, explored the school environment, created maps, discussed findings, and presented their work. These activities required deeper cognitive processing than conventional lectures and individual assignments.

The findings support Ausubel's theory of meaningful learning. New knowledge is more easily understood when connected to existing cognitive structures. In this study, maps, routes, directions, and landmarks became easier to understand because they were linked to familiar locations. Hidayat et al. (2025b) similarly found that Deep Learning in the Kurikulum Merdeka supports contextual understanding and active competency development.

The results also show improvement across cognitive, affective, and psychomotor domains. Cognitive development was reflected in higher test scores. Affective development appeared in stronger motivation and confidence. Psychomotor development was demonstrated through map drawing, exploration, and presentation. This multidimensional result is consistent with the holistic educational orientation described by Pare & Sihotang (2023b). The increase from Cycle I to Cycle II was not caused only by repeating the material. It resulted from more contextual media, longer exploration and reflection, clearer group roles, structured guidance, and more challenging worksheets. The findings support Zafirah et al. (2025b) and Komara et al. (2026b), who reported that Deep Learning improves elementary students' learning outcomes, conceptual understanding, and higher-order thinking.

Educational Impact and Research Contribution

Deep Learning supported meaningful, enjoyable, and competency-oriented IPAS instruction. It improved motivation and academic achievement simultaneously. It also developed communication, collaboration, creativity, and problem-solving skills, as emphasized by Kurniawati et al. (2019b) and Nursaya'bani et al. (2025b). The study contributes evidence from lower elementary education. It shows that Grade III students can participate successfully in Deep Learning through contextual activities and reflective classroom action research. It also demonstrates that educational innovation does not always depend on advanced technology. Pamungkas (2025b) emphasizes creativity as a foundation of educational transformation, and this study confirms that local environments can become effective learning resources.

The findings remain limited to one class of twenty students and one IPAS topic. Therefore, they cannot be generalized directly to all elementary schools. Further research should involve larger samples, different topics, comparison groups, and longer interventions to examine the consistency and sustainability of the effects.

CONCLUSION

This study concludes that the implementation of the Deep Learning approach successfully improved both students' learning motivation and learning outcomes in Grade III IPAS learning at SDN Sidomulyo 2. Through two cycles of Classroom Action Research, the approach created a more active, meaningful, and student-centered learning environment.

Students became more engaged in classroom activities, resulting in higher learning motivation and improved academic achievement. These findings indicate that integrating mindful, meaningful, and joyful learning can effectively support competency-based learning in elementary education. The study also demonstrates that local environmental resources can be utilized effectively to implement Deep Learning without relying on advanced technology. However, the findings are limited to one class and one learning topic. Future research is recommended to involve larger samples, different grade levels, and various subject areas to examine the long-term effectiveness and broader applicability of the Deep Learning approach.

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