



Application CLIS model to improve science process skills and IPAS learning outcomes

Sukma Anggraeni¹, Megawati², Randi Eka Putra³

^{1,2,3}Universitas Muhammadiyah Muara Bungo, Bungo, Indonesia

sukmaanggraini358@gmail.com¹, mega.uqi@gmail.com², randiekaputra23@gmail.com³

ABSTRACT

Student learning outcomes are determined by science process skills that encourage active involvement of students in learning activities according to the learning outcomes of IPAS. This study aims to improve the learning process, science process skills, and learning outcomes of science class III at SD Negeri 095/II Muara Bungo using the Children Learning In Science model. Low science process skills and the fact that half of the students have not met the Minimum Learning Completeness Criteria (KKTP) are the drivers behind this study. This type of research is classroom action research applied during two learning cycles covering four learning phases, including planning, implementation, observation, and reflection. Two meetings are held in each cycle. The data collection tools used are tests and observations. The results of this study show that the average science process skills and learning outcomes in cycle I have increased in cycle II. Based on the results of the analysis, it can be concluded that the Children Learning In Science model has succeeded in improving students' process skills and social studies learning outcomes. The CLIS model is an effective strategy in encouraging the active participation of students in the learning process so that the skills gained can be used to deal with problems in life.

ARTICLE INFO

Article History:

Received: 3 May 2025

Revised: 3 Aug 2025

Accepted: 5 Aug 2025

Available online: 24 Aug 2025

Publish: 29 Aug 2025

Keywords:

children learning in science; IPAS learning outcomes; science process skills

Open access

Inovasi Kurikulum is a peer-reviewed open-access journal.

ABSTRAK

Hasil belajar peserta didik ditentukan oleh keterampilan proses sains yang mendorong keterlibatan aktif peserta didik dalam kegiatan pembelajaran sesuai capaian pembelajaran IPAS. Penelitian ini bertujuan untuk meningkatkan proses pembelajaran, keterampilan proses sains, dan hasil belajar IPAS kelas III di SD Negeri 095/II Muara Bungo menggunakan model Children Learning In Science. Rendahnya keterampilan proses sains dan fakta bahwa sebagian peserta didik belum memenuhi Kriteria Ketuntasan Belajar Minimal (KKTP) menjadi pendorong di balik penelitian ini. Jenis penelitian ini yaitu penelitian tindakan kelas yang diterapkan selama dua siklus pembelajaran mencakup empat fase pembelajaran meliputi perencanaan, pelaksanaan, observasi, dan refleksi serta dua pertemuan dilakukan di setiap siklusnya. Alat pengumpulan data yang digunakan yaitu tes dan observasi. Hasil penelitian ini menunjukkan rata-rata keterampilan proses sains dan hasil belajar pada siklus I mengalami peningkatan pada siklus II. Berdasarkan hasil analisis dapat disimpulkan bahwa model Children Learning In Science berhasil meningkatkan keterampilan proses peserta didik dan hasil belajar IPAS. Model CLIS menjadi strategi yang efektif dalam mendorong partisipasi aktif peserta didik dalam proses pembelajaran sehingga keterampilan yang diperoleh dapat digunakan untuk menghadapi permasalahan dalam kehidupan.

Kata Kunci: Children learning in science; hasil belajar IPAS; keterampilan proses sains

How to cite (APA 7)

Anggaraeni, S., Megawati, M., & Putra, R. E. (2025). Application CLIS model to improve science process skills and IPAS learning outcomes. *Inovasi Kurikulum*, 22(3), 1977-1990.

Peer review

This article has been peer-reviewed through the journal's standard double-blind peer review, where both the reviewers and authors are anonymised during review.



Copyright

2025, Sukma Anggraeni, Megawati, Randi Eka Putra. This an open-access is article distributed under the terms of the Creative Commons Attribution-ShareAlike 4.0 International (CC BY-SA 4.0) <https://creativecommons.org/licenses/by-sa/4.0/>, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author, and source are credited. *Corresponding author: sukmaanggraini358@gmail.com

INTRODUCTION

The development of science and technology (IPTEK) drives the advancement of a modern system closely related to all aspects of life, including education. Education serves as a tool to develop human potential to the fullest, encompassing spiritual, emotional, social, intellectual, and physical aspects (Ariana, 2022). Education must be carried out by every citizen from an early age to produce high-quality human resources capable of competing internationally. Indonesia must take this important step to advance education towards long-term progress. The progress of education in Indonesia must be able to produce a generation of young people who are qualified, critical, creative, and innovative, in line with Article 1 paragraph 2 of Law No. 20 of 2003 concerning the National Education System (Sisdiknas), which states that in the world of education, it must always follow the demands of the times. Therefore, this idea is an effort to improve education in Indonesia to face the era of society 5.0, which is closely related to 21st-century skills, also known as the 4Cs: Creativity, Critical Thinking, Communication, and Collaboration (Khotimah et al., 2024).

This era of 21st-century skills is necessary to adapt to changes in the education system through a quality learning process (Khotimah et al., 2024). Speaking to the quality of learning, innovation in education is necessary because the world of education has developed rapidly to improve the learning process without diminishing the value of education itself, and to enhance students' science literacy. PISA defines scientific literacy as the ability to use scientific reasoning, ask critical questions, and draw conclusions based on valid evidence to understand nature and how human activities can influence it (Dewantari & Singgih, 2020). Based on the results of the 2022 Programme for International Student Assessment (PISA) Research, Indonesia ranks 67th out of 81 OECD member and partner countries in science, with an average score of 383 points. This ranking remains well below that of other developed countries, indicating low scientific literacy among Indonesian students. In fact, scientific literacy reflects an understanding of science that is essential to master, as comprehension of scientific concepts and scientific process skills can be applied to decision-making in everyday life (Pujana et al., 2022).

The National Science Teachers Association (NSTA) stated that effective scientific literacy is achieved when students are engaged through a process skills approach (Nurhanifah & Utami, 2023). Students can use scientific process skills to make decisions when facing a problem through a learning process, such as the IPAS learning process. The development of subjects in the independent curriculum is implemented in elementary education (SD)/Islamic Elementary School (MI), namely Natural and Social Sciences. IPAS is a combination of Natural Science and Social Science subjects. The Natural and Social Sciences study the relationships between living beings and inanimate objects in the universe and how they interact with one another. IPAS also studies human life as social beings and as individuals interacting with their environment. The Natural and Social Sciences shape the Pancasila Student Profile and will certainly benefit the government in its efforts to improve student science literacy in Indonesia, as noted in the book "*Pembelajaran Ilmu Pengetahuan Alam (IPAS)*" by Suhelayanti.

The characteristics of IPAS learning within the scope of elementary schools are not only understood as a collection of facts, but also encompass the process of gathering realities based on a student's ability to utilize basic insights to predict, explain, and resolve events in the surrounding environment, as mentioned in the book "*Pembelajaran Ilmu Pengetahuan Alam Sosial (IPAS)*" by Suhelayanti. This condition aligns with the cognitive developmental stage of elementary school students, who typically reach the concrete operational stage between ages 7 and 11. Jean Piaget, in Paul Suparno's book on cognitive development theory, states that a child who reaches the concrete operational stage can use logical operations in thinking. Still, these are limited to tangible objects or concrete situations that they directly observe (Melinda & Saputra, 2021). The characteristics of elementary school students at this stage include developing curiosity through investigation, trials, and experiments about things that interest them. Students can also

combine various types of objects at their level. They can think logically about real objects and events, but are not yet able to solve abstract problems. This learning theory relates to students' intellectual development in constructing knowledge, in which the teacher guides students to discover the meaning of learning and construct knowledge independently. Therefore, when students are engaged in scientific activities, they construct insights and understanding through the learning experiences they gain.

Based on the observations conducted by the researcher from November 7-14, 2024, on IPAS learning Material on the properties and uses of objects with the third-grade homeroom teacher at SD Negeri 095/II Muara Bungo, information was obtained that the delivery of the Material still uses a teacher-centered learning method, indicating that the model is less varied. The teacher does not use concrete learning media to convey abstract Material, focusing only on the teacher's and students' books. In addition, the teacher cannot develop learning that emphasizes students' scientific work, such as observation, experimentation, information processing, and communicating results, which makes students tend to be passive during the learning process. Furthermore, based on interviews with third-grade students at SD Negeri 095/II Muara Bungo, learning social science is considered quite difficult and confusing, especially in understanding theoretical material. This is because students are less actively involved in the learning process; they listen to the teacher's explanations, take notes, memorize theories, and complete assignments, which makes them bored. The attitude and scientific work of undertrained students can hinder the understanding of scientific concepts. This condition affects the results of the odd-semester final exam: of 23 students, only 9 have met the minimum completion requirement (39%), while 61 (14) have not completed. The results of these acquisitions are relatively low, which shows that the science process skills possessed are not optimal.

This issue needs to be addressed because student involvement is an important aspect of the success of the learning process. The effort needed is to improve Science Process Skills (SPS). Through these science process skills, students learn science by following the steps scientists use, such as observing, classifying, formulating hypotheses, conducting experiments, and drawing conclusions (Nisa *et al.*, 2020). Optimizing students' science process skills can be achieved by selecting an appropriate learning model, such as the Children Learning In Science (CLIS) model. This model helps develop students' understanding of problems in the learning process and tests that understanding based on observations or experimental results (Karsini, 2020). Implementing this model allows teachers to create a more memorable learning environment, engage students' interest, help students understand the material delivered by the teacher, and improve students' scientific process skills. This statement is reinforced by previous findings showing that learning using the CLIS model can improve mastery of science learning outcomes (Khotimah *et al.*, 2024).

Implementing this model allows teachers to create a more memorable learning environment, engage students' interest, help students understand the material delivered by the teacher, and improve students' scientific process skills. This statement is reinforced by previous findings showing that learning using the CLIS model can improve mastery of science learning outcomes.

LITERATURE REVIEW

The Nature of the Learning Process and Learning Outcomes

Student learning activities are both the subject and the object in educational activities. Therefore, students' active involvement in learning activities is the key to achieving educational goals. Independent learning is a process that can bring about positive changes in an individual's personality, including the enhancement of knowledge, skills, understanding, attitudes, mindset, and other abilities mentioned in the book *Learning and Teaching: 4 Pillars for Improving Pedagogical Competence* by Djameluddin. One indicator of students' learning success is their academic achievements.

Learning outcomes are the changes in behavior that occur when students engage in learning activities, encompassing the development of knowledge, attitudes, and skills (Yandi *et al.*, 2023). In addition, learning outcomes are changes in behavior in individual students that arise from learning experiences through interactions with other individuals or their surrounding environment (Kurniawan *et al.*, 2024). Furthermore, learning outcomes are achieved when someone gains something through behavioral changes acquired through experience (Widyasari *et al.*, 2024).

Science Process Skills

Basically, science is not only understood as a collection of knowledge encompassing facts, concepts, principles, theories, and laws, but also includes scientific attitudes, processes, and products generated through the search for and discovery of scientific knowledge. The basic ability to acquire knowledge about scientific products is referred to as Science Process Skills (SPS). In Suja's book on science process skills and their measurement, it is mentioned that SPS is a set of skills applied by experts to examine phenomena scientifically. In addition, the role of science process skills is to build students' learning motivation, strengthen their understanding of the concepts and facts being studied, and enable them to apply theories in real life. (Sari, 2021). The Ministry of Education and Culture determined that basic science process skills include activities such as observation, asking questions and making predictions, planning and conducting investigations, processing and analyzing data and information, evaluation and reflection, and presenting results.

Science learning cannot be separated from science process skills, as these skills are among the learning outcomes of Integrated Science (IPAS), as clearly stated in the Merdeka Curriculum. This means that through IPAS learning, students are expected not only to understand IPAS material but also to be proficient in using scientific methods to explore and test theories in IPAS. Therefore, there is a need to create IPAS learning that emphasizes science process skills. These skills can be trained gradually but simultaneously to ensure that the learning outcomes of IPAS are achieved (Patimah *et al.*, 2023).

IPAS learning in elementary school

The development in the independent curriculum that distinguishes it from previous curricula is the integration of science and social studies subjects into a single subject called Natural and Social Sciences (IPAS). IPAS is a subject in the independent curriculum, taught only at the elementary school level. The characteristics of IPAS are adapted to the times to help students recognize existing problems and find solutions that support sustainable development. In the book "*Pembelajaran Ilmu Pengetahuan Alam dan Sosial*" by Suhelayanti, there are 2 main parts of IPAS, namely understanding science and social studies, as well as the process skills that must be emphasized for students.

Natural and Social Sciences (IPAS) are sciences concerned with the interactions between living beings and non-living things, including how they influence each other. In addition, IPAS analyzes the dynamics of the order of life of individuals or other social beings in relation to their surrounding environment (Adnyana & Yudaparmita, 2023). The goals of learning Natural and Social Sciences (IPAS) are diverse, including enhancing students' talents, as learning does not occur only in the classroom through theory but can also be gained through practical activities. This means that teachers, as learning facilitators, must be able to create IPAS learning that focuses on the scientific process or scientific performance while also fostering students' scientific attitudes. (Megawati & Sari, 2025).

The implementation of IPAS learning in the independent curriculum at elementary schools is student-centered, encouraging active participation and collaboration. In this context, learning becomes more flexible, in-depth, meaningful, and enjoyable, with a focus on developing essential knowledge and skills

according to the students' levels. This IPAS learning is carried out in a more real-world and broader way by conducting more concrete activities and encouraging students to work in groups and present their work throughout the learning process. The teacher serves as a facilitator, supervising students' learning activities and assisting when they encounter difficulties. After the lesson, the teacher evaluates and summarizes the material covered. Next, the teacher asks students questions and conducts a reflection together. (Herdiansyah *et al.*, 2022).

Children Learning In Science (CLIS) Learning Model

Children Learning In Science (CLIS) is a learning model developed with a generative approach, grounded in Piaget's constructivist theory, that focuses on student activities that deepen their understanding of ideas related to existing knowledge, as well as on evaluating and discussing various problems so they can express opinions independently. This model was first introduced by Driver in 1988 in the UK and later by the CLIS team mentioned in the book 164 Contemporary Learning Models by Amin. The CLIS learning model aims to develop thinking about learning problems and to reconstruct those ideas through observation or experimentation, thereby helping learners design and retain concepts for longer (Karsini, 2020).

The CLIS learning model certainly has its characteristics, namely a constructivist perspective, and it refers to students' experiences and prior knowledge. Learning is student-centered, allowing students to participate and acquire their own knowledge actively. Students are involved in hands-on, minds-on activities that give them space to engage actively in learning, and teachers use learning resources from the environment in the learning process (Darsanianti *et al.*, 2024). The advantages of this CLIS model include training students to become more accustomed to solving problems, allowing them to be actively involved in the learning process, and making the classroom environment more comfortable (Khotimah *et al.*, 2024).

Student involvement in the learning process can foster active participation, thereby positively affecting learning outcomes. Meaningful learning can occur when students can associate new knowledge with their cognitive structures (Megawati & Yantoro, 2022). It means that students can connect newly acquired information with prior knowledge to build a more comprehensive understanding. In the book "*Materi dan Pembelajaran IPA SD*" by Rustaman, the stages in the CLIS model include the following: orientation; generating ideas (expressing and exchanging ideas, opening conflict situations, constructing new ideas, and evaluation); applying ideas; and reinforcing ideas.

METHODS

This study uses Penelitian Tindakan Kelas (PTK). This research activity was implemented in Class III at SD Negeri 095/II Muara Bungo, Cadika, Kecamatan Rimbo Tengah, Kabupaten Bungo, Jambi Province. This type of research is used because it can be designed to improve the quality of classroom learning processes through actions aimed at enhancing learning process skills and student learning outcomes in the Natural Sciences subject in Class III at SD Negeri 095/II Muara Bungo. Classroom Action Research is research conducted directly in the classroom to improve the quality of learning and to examine the impact of the actions applied to the research subjects in the class, as described in the book Classroom Action Research by Aprizan. In another classroom action research, it was shown that applying the CLIS learning model can improve the process and learning outcomes related to the water cycle. Students develop concepts, ideas, and thoughts about a problem through experiments or observations, so the application of this model can create an active, creative, and enjoyable learning atmosphere (Muslimin *et al.*, 2023).

Classroom action research was conducted in the even semester of the 2025/2026 academic year at SD Negeri 095/II Muara Bungo, in accordance with the school's academic calendar. This research activity is based on the book Classroom Action Research by Arikunto, divided into two cycles over four meetings in the learning process, including planning activities (initial planning where the researcher coordinates with the class teacher regarding the material to be taught, preparing teaching modules, student worksheets, observation sheets for teachers, students, and scientific process skills, learning outcome test questions, tools/materials and learning media needed, determining peers to collaborate in the research, and validating instruments), implementation (the researcher carries out the classroom action research according to the CLIS model steps), observation (observing the learning process to identify obstacles in the implementation of actions as well as the effects of the actions carried out), and reflection (evaluating activities conducted in the cycle and reformulating corrective actions in the next cycle). The subjects of this study were 23 third-grade students from SD Negeri 095/II Muara Bungo, comprising 15 males and 8 females. The data collection methods were tests and observations. The research instruments included tests to measure students' science learning outcomes after the intervention, science process skills observation sheets to assess improvements in students' science process skills, and teacher and student observation sheets to evaluate the proper implementation of the CLIS model. The collected data were then analyzed using qualitative and quantitative methods.

The analysis of data from teachers' and students' observations of the implementation of the learning process using the CLIS model was carried out using the following formula.

$$\text{Observation of teachers and students} = \frac{\text{The score Obtained}}{\text{Maximum score}} \times 100\%$$

The subsequent score acquisition is classified as shown in **Table 1**.

Table 1. Category of Teacher and Student Observation Assessment

No	Level of Proficiency (%)	Categori
1	86 - 100	Excellent (A)
2	76 - 85	Good (B)
3	60 - 75	Sufficient (C)
4	55 - 59	Deficient (D)
5	≤54	Fail (TL)

Source: Adoptioni Winandika, 2024

The following formula serves as the basis for calculations in analyzing students' science process skill data.

$$\text{Scientific process skills} = \frac{\text{The score obtained}}{\text{Maximum score}} \times 100\%$$

The scores obtained are then categorized according to **Table 2**.

Table 2. Category of assessment for observing science process skills

No	Score (%)	Categori
1	85,00 - 100,00	Very High
2	70,00 - 84,99	High
3	55,00 - 69,99	Moderate
4	40,00 - 54,99	Low
5	0,00 - 39,99	Very Low

Source: Adoption Husen et al., 2017

The analysis of the IPAS learning outcomes test data is conducted by calculating test scores using the following formula.

$$\text{Classical completeness} = \frac{\text{Number of students who have complete their studies}}{\text{Total number of students}} \times 100\%$$

The scores obtained are then categorized according to **Table 3**

Table 3. Assessment Categories of Student Learning Outcomes

No	Score	Description
1	$70 \leq N \leq 100$	Mastered
2	$0 \leq N \leq 69$	Not Mastered

Source: KKTP IPAS SD Negeri 095/II Muara Bungo 2025

RESULTS AND DISCUSSION

The objectives of this classroom action research include improving the learning process, science process skills, and learning outcomes in IPAS, as well as implementing the CLIS model in Grade III at SD Negeri 095/II Muara Bungo. The research was conducted in two cycles over two weeks, with the researcher acting as the teacher and the Grade III class guardian as the observer, assisted by four other observers. Cycle I took place on May 26 and 27, 2025, with discussions on the water cycle material and its experiments. Cycle II was conducted on June 2 and 3, 2025, with discussion topics on human activities that affect the water cycle and water conservation actions. The stages applied in each learning process were based on the CLIS steps and methods.

Observation Results of Teachers and Students

Teacher and student observations were conducted to gather data on teachers' implementation of learning and students' participation in the learning process using the Children Learning In Science model, which includes the preliminary, core (orientation, idea generation, idea reconstruction, idea application, idea reinforcement), and closing stages. In this activity, observation results were obtained based on teacher and student observation sheets as follow.

Table 4. Comparison of Teacher and Student Observation Sheet Results in Cycle I and Cycle II

No	Cycle	Average percentage of teacher LO (%)	Average percentage value of student learning outcomes (%)
1	Siklus I	92,5	61,73
2	Siklus II	100	83,47

Source: 2025 Research

Table 4 presents the implementation of the CLIS model to improve the learning process in class III at SD Negeri 095/II Muara Bungo. Based on the data analysis, the average score of the teacher's observation sheet in cycle I was 92.5%, which increased in cycle II to 100%, with a very good category. Activities that were not carried out in cycle I were completed in cycle II, and the teacher managed the class well. In cycle I, the average observation sheet results of the students reached 61.73%, increasing to 83.47% in cycle II, with a good category. This indicates that there was an improvement in the learning process, such as students being more courageous in expressing opinions, actively discussing, conducting experiments directly, and actively learning in groups. This improvement occurred because the teacher carried out the learning process using the CLIS model as a whole, and the students followed the teacher's guidance as

best as possible, achieving results that exceeded the target for the learning process success indicators, which was 80%.

Results of Observing Science Process Skills

The science process skills of students, measured during the learning process using the CLIS model, include five indicators: observing, predicting, planning and conducting investigations, processing and analyzing data and information, and communicating results. The results of the observation of science process skills conducted by two observers in cycles I and II are presented in **Table 5** below.

Table 5. Results of Students' Science Process Skills Observation Sheet Cycle I and Cycle II

No	KPS Aspect	Cycle I (%)	Cycle II (%)
1.	Observing	51,08	70,65
2.	Predicting	76,08	84,78
3.	Planning and conducting investigations	59,78	79,34
4.	Processing, analyzing data, and information	58,69	85,87
5.	Communicating results	55,43	82,61
Average		60,21	80,65

Source: 2025 Research

Table 5 presents the analysis of the observation results on the science process skills of third-grade students at SD Negeri 095/II Muara Bungo in cycles I and II. The students' observation skills in cycle I were 51.08%, which increased to 70.65% in cycle II. In cycle I, the students' predictive ability was 76.08%, which increased to 84.78% in cycle II. The students' ability to plan and conduct investigations increased from 59.76% in cycle I to 79.34% in cycle II. The students' ability to process and analyze data and information in cycle I was 58.69%, which increased to 85.87% in cycle II. The students' ability to communicate the results in cycle I was 55.43%, and also increased in cycle II to 82.61%. The results of the observation sheets on students' science process skills increased, with an average of 60.21% in cycle I rising to 80.65% in cycle II, categorized as high. The improvement across all indicators indicates that implementing the CLIS model has been proven to enhance students' science process skills.

IPAS Learning Test Results for Students

The students' learning outcomes in this study were determined from scores on multiple-choice tests administered on the IPAS material studied in each cycle. The data analysis of the obtained scores is shown in the following figure, which shows the learning completeness percentage.

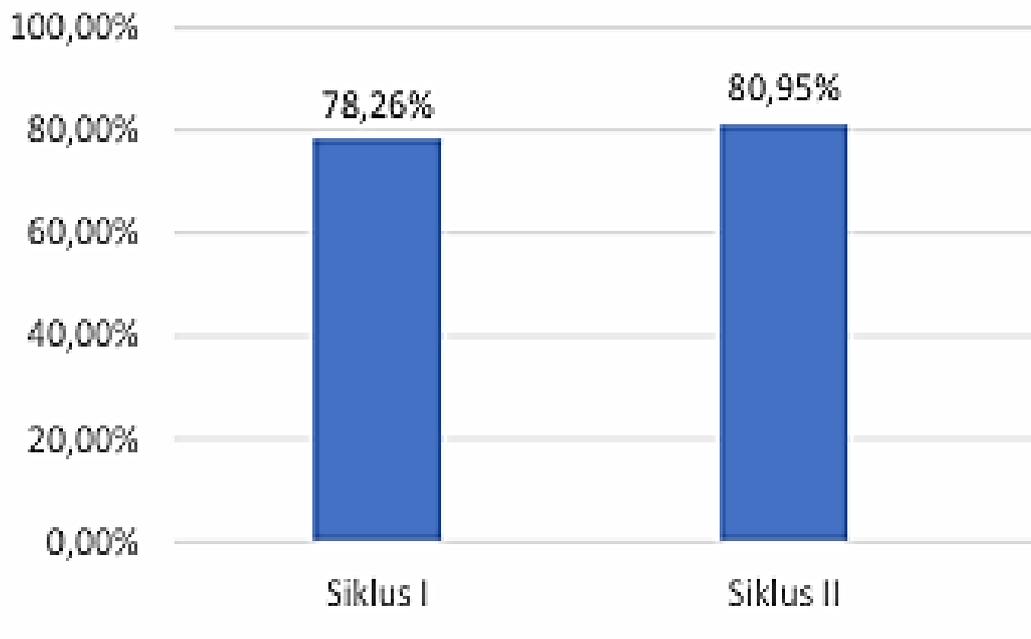


Figure 1. Percentage of student learning completeness in IPAS for cycle I and cycle II
Source: 2025 Research

Based on **Figure 1** above, the percentage of IPAS learning outcomes after implementing actions using the CLIS model achieved a learning completeness of 78.26% in cycle I and increased to 80.95% in cycle II, exceeding the predetermined achievement indicator of 75%. Based on the results obtained, it shows that the achievement of students' learning outcomes not only depends on individual abilities but is also influenced by the effectiveness of the learning process, the selection of a good learning model, the adaptation of learning materials, and a learning environment that can support students' activities to optimize their abilities.

Discussion

The CLIS model focuses on creating learning stages that are not only effective but also enjoyable and contextually relevant to students. By using an engaging model and presenting lesson material in a context relevant to students' world, CLIS can bridge the new knowledge that students learn with various real-life experiences. This connection helps students see how science motivates them, enhancing their desire to learn (Putri *et al.*, 2025). Basically, CPS is the ability to use thinking, reasoning, and actions guided by scientific procedures. This can encourage students' interest in expanding their knowledge until they can acquire and design a concept and theory (Samsuri, 2021). As in previous research, a deep understanding of the subject matter is a key factor in supporting students' learning success (Susanto & Anggresta, 2024). A strong understanding can boost motivation, self-confidence, and students' ability to apply insights in various situations. Therefore, teachers can use research findings to design effective learning activities that support student engagement and create more memorable learning experiences, thereby improving learning outcomes.

Observation of Teachers and Students

Learning, which was initially monotonous, has now become more enjoyable and meaningful for students through concrete, everyday learning activities, making abstract concepts easier for them to understand through experimentation. Students who were initially passive are now beginning to show courage in

expressing their opinions and can cooperate with their peers. This aligns with research indicating that experiential learning plays an important role in science education because it provides students with the opportunity to engage directly with the concepts being learned and to understand the material more deeply through experiments. Students can also develop critical thinking skills and solve problems by connecting theoretical knowledge to real-life situations (Kotsis, 2024). The CLIS model can facilitate students' understanding, encourage them to solve problems independently, and create a classroom environment that is comfortable, creative, and collaborative (Herliana *et al.*, 2021). Direct involvement in learning activities makes students more active, while the pride of successfully discovering scientific concepts on their own enhances the meaning of learning. On the other hand, teachers play a role in creating an effective learning environment by using learning media tailored to everyday needs.

Observation of Science Process Skills

Findings from previous research suggest that learning using the CLIS model can improve elementary school students' science process skills (Rochmawati & Muslim, 2022). This study found that the development of students' scientific process skills includes skills in observing, predicting, processing, analyzing data and information, planning and conducting investigations, and communicating results

In observation skills, students can focus on phenomena presented by the teacher through videos or concrete learning media, such as a water cycle diorama. Phenomena that occur in real life can attract students' attention, allowing them to observe well and generate ideas. This observation can broaden students' knowledge while also helping them develop new skills. (Warini *et al.*, 2023).

In prediction skills, students can predict events in their current lives and connect them to the learning material. The formation of new knowledge occurs through individual construction based on real-life experiences (Lubis *et al.*, 2024). It means that students do not merely receive information passively, but actively process it and relate it to their personal experiences or the surrounding environment.

In the skill of planning and conducting investigations, students practice preparing a plan to be carried out with their group based on previously given questions, identifying actions to investigate through experiments, and discussing the results together. If previously the learning was only guided by books, students can practice this in real life or conduct experiments. Students can actively participate in the learning process when it is appropriately structured (Lubis *et al.*, 2024).

In processing skills and analyzing data and information, students can process the results of experiments presented systematically in the student worksheet (LKPD), which are then analyzed through group discussions. A systematic and targeted LKPD on science material can guide students to gain a deeper understanding, thereby boosting their confidence in mastering the learning material (Yani & Hadiyanti, 2025). Students who were initially reluctant to express their opinions are now willing to try sharing their thoughts. To complete tasks, cooperative learning is needed, emphasizing teamwork, mutual assistance, and discussion (Lestari & Azzahri, 2023).

In communication skills, students can present the results of experiments, and their communication skills improve, as seen from their confidence in expressing results and answering questions from other groups. The ability to communicate ideas and thoughts effectively in a learning context through speaking, writing, or other methods (Maksum *et al.*, 2024).

Student IPAS Learning Outcomes

At the end of each research cycle, the researcher administers a learning outcomes test to students to assess the level of mastery of the learning outcomes. Previous research indicates that the CLIS model

effectively improves students' learning outcomes and encourages them to be more actively involved, remain focused, and maintain high motivation during the learning process. (Hadinda *et al.*, 2022). The findings of this study indicate that the percentage of student learning mastery in each cycle increased, influenced by the use of the CLIS learning model, which allows students to experience learning through the creation and organization of new ideas as well as problem-solving. Therefore, the knowledge gained is not just from textbooks and memorization, but from a relevant understanding that is not easily forgotten. Previously, students' learning outcomes did not meet expectations because they lacked meaningful conceptual understanding. This aligns with research indicating that the CLIS model helps strengthen students' understanding of scientific concepts. Therefore, the implementation of this model is highly recommended in science learning at the primary school level (Knyartutu *et al.*, 2025).

CONCLUSION

The use of the Children Learning In Science (CLIS) learning model has been proven to improve science process skills and the science learning outcomes of third-grade students at SD Negeri 095/II Muara Bungo. This approach can support students' active involvement in the learning process, help them better understand abstract scientific concepts, and enable the skills they acquire to be applied in their daily lives. The significant improvement in skills during observations can build meaningful scientific knowledge, as demonstrated through activities such as observation, making predictions, planning and conducting investigations, processing and analyzing data and information, and presenting results. With the improvement of science process skills of students in Grade III at SD Negeri 095/II Muara Bungo, learning achievements and science and social studies (IPAS) learning outcomes are also realized. Learning outcomes are determined through an effective learning process using an appropriate model, aligned with the material context, and through the development of science process skills that support students in building knowledge independently. In addition, this improvement aligns with educational priorities that emphasize the four competencies of the 21st century: creativity, critical thinking, communication, and teamwork. Therefore, CLIS can become an attractive option for improving learning quality by integrating science literacy, an important indicator for addressing the challenges of changing times.

Based on the findings of this study, it is recommended that the CLIS learning model be implemented by teachers across classes and other learning topics, particularly in IPAS subjects that require active involvement and deep conceptual understanding, to address low student learning outcomes. For schools, it is recommended to provide supporting facilities such as concrete learning media that match the material being studied and tools for conducting simple experiments so that students can fully develop their competencies.

AUTHOR'S NOTE

The author states that this article is free from any form of conflict of interest. All data and content in this article are the author's original work and are free from plagiarism.

REFERENCES

- Adnyana, K. S., & Yudaparmita, G. N. A. (2023). Peningkatan minat belajar IPAS berbantuan media gambar pada siswa sekolah dasar. *Edukasi: Jurnal Pendidikan Dasar*, 4(1), 61-70.
- Ariana, I. G. G. (2022). Meningkatkan aktivitas belajar IPA pasca pandemi dengan model pembelajaran CLIS pada siswa kelas V SD. *Journal of Education Action Research*, 6(1), 87-94.
- Darsanianti, D., Kune, S., & Ristiana, E. (2024). Implementasi model pembelajaran Children Learning in Science (CLIS) dalam pembelajaran IPA di sekolah dasar. *Jurnal of Education Research*, 5(1), 189-196.
- Dewantari, N., & Singgih, S. (2020). Penerapan literasi sains dalam pembelajaran IPA. *Indonesian Journal of Natural Science Education (IJNSE)*, 3(2), 366-371.
- Hadinda, A., Syarif, M. N., Anas, M., & Rasjid, Y. (2022). Penerapan model pembelajaran children learning in science dalam meningkatkan hasil belajar peserta didik. *Jurnal Pendidikan Biologi*, 5(1), 44-57.
- Hardiansyah, F., Misbahudholam AR, M., & Hidayatillah, Y. (2022). IPAS learning assessment to measure science process skill in elementary school. *International Journal of Elementary Education*, 6(4), 612-623.
- Herliana, T., Supriadi, N., & Widyastuti, R. (2021). Kemampuan pemahaman konsep dan komunikasi matematis: Pengaruh model pembelajaran children learning in science (CLIS) berbantuan alat peraga edukatif. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 5(3), 3028-3037.
- Husen, A., Indriwati, S. E., & Lestari, U. (2017). Peningkatan kemampuan berpikir kritis dan keterampilan proses sains siswa SMA melalui implementasi problem based learning dipadu think pair share. *Jurnal Pendidikan*, 2(6), 853-860.
- Karsini, N. K. (2020). Penerapan model pembelajaran Children Learning in Science (CLIS) upaya meningkatkan prestasi belajar IPA. *Jurnal Ilmiah Pendidikan Profesi Guru*, 3(2), 324-331.
- Khotimah, K., Suryandari, K. C., & Ngatman, N. (2024). Upaya meningkatkan kerjasama dan hasil belajar IPA melalui model pembelajaran Children Learning in Science (CLIS) pada siswa kelas V. *Jurnal Ilmiah Kependidikan*, 12(1), 128-137.
- Knyartutu, R., Pelamonia, J., & Souhoka, R. (2025). Improving learning outcomes in integrated science on the topic of force through the children's learning in science model among grade IVb students at Elementary School Negeri Tiakur. *Honoli of Journal Primary Teacher Education*, 1(1), 22-33.

- Kotsis, K. T. (2024). The significance of experiments in inquiry-based science teaching. *European Journal of Education and Pedagogy*, 5(2), 86-92.
- Kurniawan, A. A., Rahmawati, N. D., & Dian, K. (2024). Pengaruh media pembelajaran interaktif Canva terhadap hasil belajar IPAS pada peserta didik kelas IV sekolah dasar. *Jurnal Inovasi, Evaluasi dan Pengembangan Pembelajaran*, 4(2), 179-187.
- Lestari, E., & Azzahri, F. (2023). Penerapan metode pembelajaran kooperatif pada pelajaran pendidikan agama Islam. *Journal Research and Education Studies*, 3(3), 84-95.
- Lubis, P., Hasibuan, M. B., & Gusmaneli, G. (2024). Teori-teori belajar dalam pembelajaran. *Intellektika: Jurnal Ilmiah Mahasiswa*, 2(3), 01-18.
- Maksum, H., Purwanto, W., Ampera, D., Yuvenda, D., & Hasan, H. (2024). Improving problem-solving and communication skills in automotive vocational education through the development of Teaching Factory Model with Problem-Based Learning (TEFA-PBL) concept. *International Journal of Education in Mathematics, Science and Technology*, 12(2), 364-386.
- Megawati, M., & Sari, R. N. (2025). Peningkatan proses dan hasil belajar IPA menggunakan model quantum learning di sekolah dasar. *Jurnal Muara Pendidikan*, 10(1), 177-184.
- Megawati, M., & Yantoro, Y. (2022). Systematic literature review: Implementasi culturo-techno-contextual approach dalam pembelajaran IPA di sekolah dasar. *Jurnal Muara Pendidikan*, 7(2), 369-377.
- Melinda, T., & Saputra, E. R. (2021). Canva sebagai media pembelajaran IPA materi perpindahan kalor di SD. *Jurnal Inovasi Pendidikan Dasar*, 5(2), 96-101.
- Muslimin, M., Lukman, L., & Fadila, S. (2023). Penerapan model pembelajaran children learning in science untuk meningkatkan hasil belajar siswa kelas V. *Jurnal Ilmu Pendidikan Dasar*, 6(3), 656-663.
- Nisa, H., Parid, M., Hidayat, A., & Mustofa, A. (2020). Relevansi keterampilan proses sains dalam pembelajaran IPA tingkat sekolah dasar dengan materi ajar tematik kelas IV tema 2. *Al-Mudarris (Jurnal Ilmiah Pendidikan Islam)*, 3(2), 169-182.
- Nurhanifah, A., & Utami, R. D. (2023). Analisis peran guru dalam pembudayaan literasi sains pada siswa kelas 4 sekolah dasar. *Jurnal Elementaria Edukasia*, 6(2), 463-479.
- Patimah, S., Megawati, M., Hidayat, P. W., & Putra, R. E. (2023). Peningkatan proses dan hasil belajar IPA melalui model problem based learning siswa sekolah dasar. *Jurnal Muara Pendidikan*, 8(2), 393-400.
- Pujana, L. A., Dwijayanti, I., & Siswanto, J. (2022). Pengembangan bahan ajar berbasis model pembelajaran CLIS seri AKM untuk meningkatkan kemampuan literasi sains siswa SD. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 7(2), 589-604.
- Putri, D. A., Suntari, Y., & Yudha, C. B. (2025). Implementasi model children learning in science dalam pembelajaran IPAS materi ekosistem kelas III. *Jurnal Inovasi Pendidikan Matematika dan IPA*, 5(2), 627-637.
- Rochmawati, U., & Muslim, A. (2022). Penerapan model CLIS (Children Learning in Science) untuk meningkatkan keterampilan proses sains siswa kelas IV SD. *Jurnal Pedagogik Pendidikan Dasar*, 9(2), 67-76.

- Samsuri, T. (2021). Implementasi pembelajaran biologi dengan metode EPA untuk meningkatkan keterampilan proses sains dan hasil belajar kognitif siswa. *Jurnal Kependidikan Fisika*, 9(1), 101-112.
- Sari, L. M. (2021). Implementasi metode eksperimen untuk mengembangkan keterampilan proses sains dan literasi sains anak usia dini. *Jurnal Teknologi Pendidikan dan Pembelajaran*, 8(1), 88-98.
- Susanto, G. B., & Anggresta, V. (2024). Pengaruh lingkungan belajar dan tingkat pemahaman siswa terhadap hasil belajar. *Research and Development Journal of Education*, 10(2), 994-1002.
- Warini, S., Hidayat, Y. N., & Ilmi, D. (2023). Teori belajar sosial dalam pembelajaran. *Education and Learning Journal*, 2(4), 566-576.
- Widyasari, D., Miyono, N., & Saputro, S. A. (2024). Peningkatan hasil belajar melalui model pembelajaran problem based learning. *Jurnal Inovasi, Evaluasi dan Pengembangan Pembelajaran (JIEPP)*, 4(1), 61-67.
- Winandika, G. (2024). Efforts to increase students' curiosity and learning achievement IPAS in grade iv natural phenomena material. *Jurnal Riset Ilmu Pendidikan*, 4(4), 154-164.
- Yandi, A., Putri, A. N. K., & Putri, Y. S. K. (2023). Faktor-faktor yang mempengaruhi hasil belajar peserta didik (literature review). *Jurnal Pendidikan Siber Nusantara*, 1(1), 13-24.
- Yani, D. E., & Hadiyanti, P. O. (2025). The influence of using animated videos on elementary school students' learning motivation. *Inovasi Kurikulum*, 22(2), 1069-1082.

This page is intentionally left blank.