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Analysis of Basic Principles of Education Providers and Scientific Trees in Science Literacy-Based Learning in Elementary Schools: A Multi-Aspect Review

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Abstract : Science literacy-based learning in primary schools plays a strategic role in developing critical thinking, problem-solving, and evidence-based decision-making skills as important competencies of the 21st century. However, the implementation of learning in the field is still dominated by the orientation of material mastery and the achievement of cognitive learning outcomes, so that the development of science process skills and students' scientific disposition has not been carried out optimally. This study aims to analyze the implementation of basic principles of education and science trees in science literacy-based learning through a multi-aspect review that includes philosophical, sociological, anthropological, psychological foundations, as well as ontological and epistemological perspectives. This study uses a descriptive qualitative approach carried out at SDN Plumbon 2 with teachers and 20 fourth grade students as research subjects. Data was collected through observation, interviews, and documentation, then analyzed using the stages of data reduction, data presentation, and conclusion drawing with validity tests through source triangulation and triangulation techniques. The results of the study show that science literacy learning has accommodated several basic principles of education through the association of materials with daily life and the application of discussion activities. However, learning is still dominated by a teacher-centered, concept-mastery-oriented approach, and uses success indicators that emphasize cognitive aspects rather than process skills and scientific disposition. Furthermore, the application of the science tree concept has not shown complete integration between the foundation of education, the learning process, and the results of science literacy. The contribution of this research lies in the development of an integrative analytical framework that connects basic education principles, ontological and epistemological dimensions, and the concept of the science tree as a basis for evaluating the success of science literacy learning more comprehensively. The framework expands the learning evaluation approach, which previously focused on cognitive outcomes, to an assessment that includes the process of knowledge formation and the students' scientific disposition.

Keywords : Science Literacy; Tree of Knowledge; Principles of Education; Constructivism; Elementary School

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Introduction

Basic education has an important role in creating the foundation for students' thinking skills, character, and skills in the 21st century. Science literacy is more than just the ability to understand scientific concepts, but it also includes critical thinking,

problem-solving, evidence-based decision-making, and the ability to connect scientific knowledge to everyday life.(Latif, et al., 2022). Therefore, science literacy learning in elementary schools is expected to provide a new innovation for students who are active in observing and analyzing natural phenomena in the surrounding environment.

Teaching practices in the field show that the implementation of science literacy at the elementary school level still faces various fundamental problems. Science teaching tends to emphasize more on mastering the material and memorizing concepts, so students focus more on remembering terms, formulas, and definitions rather than understanding the process in depth (Arbadilah, et al., 2025). This condition also confirms that there is a significant gap between the ideal goal of science literacy which emphasizes the integration of understanding scientific concepts and processes with the reality of learning in the classroom which is still dominated by memorization orientation and the achievement of academic grades alone (Rohmaya 2022). Teacher-focused teaching approaches are also still prevalent, where teachers act as the primary source of knowledge, while students act as passive recipients of information (Vina and Paramita 2023). As a result, science education has not fully succeeded in building a culture of scientific thinking, which is at the core of science literacy itself.

Globally, the science literacy skills of primary school students still require serious and sustained attention, especially in the face of the dynamics of the challenges of the 21st century marked by the rapid development of science and technology (Ragil et al., 2022). In this context, science literacy is no longer enough to be interpreted as mastery of concepts alone, but also includes the ability to think critically, analyze information in depth, and make decisions based on valid scientific evidence (Wiratman et al., 2023). As a result, students often experience difficulties when dealing with complex scientific information, so students tend to be less responsive to scientific problems that require deep thinking and science learning objectives.

In daily teaching and learning activities, teachers have an important role in directing and determining the quality of the learning process through the choice of strategies used (Putri and Gumala 2023). Indirectly, teachers use certain epistemological approaches, which affect the way students understand and build knowledge. The choice of learning strategy will determine whether students are perceived as recipients of information or as active actors who create knowledge through experience (Rukmana and Watung 2023). In this case, the teacher serves as a link between the concept of the "science tree" of basic education and the practice that occurs in the classroom (Hartoyo 2022). The quality level of learning interaction is highly dependent on the teacher's ability to translate these principles into relevant learning activities.

In science teaching, an inquiry-focused approach is one of the important methods to improve overall science literacy (Rohmaya 2022). This method requires

students to be active in asking questions, making observations and running experiments as part of an effort to discover science. This causes students' science literacy skills to often only develop textual or conceptual understanding, without being supported by in-depth empirical experience (Khotimah, 2025). As a result, students are not used to applying scientific processes practically, so students' critical and analytical thinking skills have not been developed optimally.

The importance of this research for educational practice in Indonesia has become increasingly significant along with the implementation of the Independent Curriculum which emphasizes flexibility and variety in learning methods (Maryanti, et al., 2025). This curriculum is created to provide greater opportunities for teachers and students to create a learning experience that suits the needs, interests, and characteristics of each student (Sumarmi 2023). Therefore, the teaching approach that focuses on students and is based on the process of inquiry and exploration is very compatible with the principles of the Independent Curriculum. Thus, this research is expected to provide input to strengthen teachers' understanding of the importance of connecting philosophical, epistemological, and practical aspects in creating meaningful learning experiences.

The teacher-focused learning method places the teacher as the main source of knowledge, knowledge is considered as something fixed, objective, and can be transferred directly to students (Hafid, 2025). In this approach, students usually play the role of passive recipients who follow a predetermined learning flow. In contrast, a student-focused approach considers knowledge to be dynamic and open, built through active interaction between students and the learning environment.

The emergence of the idea of a scientific tree in basic education aims to provide an orderly and systematic framework of thinking to understand the relationship between fields of science (Srivastava, 2024). This idea considers education as a whole unit, each branch of science is interconnected and supports each other in the development of students' competencies as a whole (Rukmana and Watung 2023). In this illustration, the roots symbolize philosophical, epistemological, and valued foundations, the stem represents the learning process, while the branches and fruits reflect the learning outcomes in the form of knowledge, skills, and attitudes.

Ontologically, science literacy at the elementary school level should be seen as an effort to introduce and foster students' awareness of the nature of the existence of the universe and the various phenomena in it (Irsan 2021). Meanwhile, epistemology in education has a very significant role in determining how knowledge is acquired, tested and developed during the learning process (Suryati 2025). This basis encourages students to have a critical, reflective, systematic, and objective attitude when analyzing various phenomena that students face (Khotimah, 2025). In the context of science studies, epistemology is a framework of thinking that helps students in understanding in depth about scientific processes such as observations,

experiments, and logical reasoning. Therefore, the epistemological basis ensures that science education is carried out responsibly, has scientific validity, and can make a real contribution to students' lives (Sukma 2025).

Constructivistic learning strategies are based on the view that knowledge cannot be transferred directly from teacher to student, but must be actively built by students through meaningful learning experiences (Apdoludin and Martinisyamin 2022). This approach makes students the center of the learning process, students actively interpret information, relate new knowledge to existing experiences, and create understanding through interaction with the environment and peers (Febriani, 2024). This is in line with the principles in Law Number 20 of 2003 concerning the National Education System (Ministry of Education and Culture, 2024). Education is not only seen as a process of imparting knowledge, but also as an effort to build students' thinking skills, creativity, and independence.

Based on previous research, the majority of discussions on science literacy at the elementary school level are still focused on the effectiveness of teaching models, the use of tools, or improving student learning achievement(Hamna, Khaerul, and Bk 2022). On the other hand, studies that link science literacy to basic concepts of education and knowledge trees through diverse approaches are still very rare. In this context, this study presents an innovation in the form of an integrative analysis of the basic concepts of education, knowledge trees, and science literacy-based learning using various ontological and epistemological reviews in the realm of basic education.

From the above explanation, we can conclude that it is important to conduct an in-depth analysis of the fundamental principles of education and the concept of the scientific tree within the framework of science literacy. So far, the study of science literacy and the basis of education tends to be limited and descriptive, so it has not provided a comprehensive picture of the relationship between philosophical, epistemological, and practical aspects in the learning process. Thus, this research is present as a solution to overcome these shortcomings by presenting a more comprehensive and integrated multi-aspect analysis approach. It is hoped that this approach can provide new insights in understanding how basic education principles and scientific structures can be applied in real terms in the learning process, especially to improve the quality of science literacy among elementary school students.

Research Methods

This study uses a descriptive qualitative approach that aims to describe and analyze in detail the basic principles of education and the application of science trees in science literacy-based learning activities at the elementary school level through a review from various aspects. This research was carried out on April 15, 2026, at SD Plumbon 2, involving 20 fourth-grade students as the object of research. Grade 4 teachers play the role of the main informants who are directly involved in the learning

process. The data collection methods used include observation, interviews, and documentation. Observations were conducted to obtain information related to the application of science literacy learning in the classroom, while interviews were conducted to gather deeper insights into teachers' understanding and practice in applying basic principles of education in teaching. In addition, the documentation includes learning materials, photos of activities, and documents related to the focus of the research, which serve as supporting data. To ensure the success of the research instrument, observation sheets and interview guides are verified by experts to assess the validity, suitability of the indicators, and the ability of the instrument to measure the research objectives.

The data analysis process is carried out gradually and continuously, from data collection to drawing conclusions. Data obtained from observations and interviews regarding the application of students' science literacy were then collected and compiled according to the focus of the research. Furthermore, researchers reduce data by selecting, simplifying, and focusing on relevant information to gain insights that fit the research objectives. The selected data is then presented regularly to support the process of interpretation and interpretation of the results. To ensure the validity of the data, this study applied source triangulation and technical triangulation techniques by comparing the results of observations, interviews, and documentation that had been obtained. Through the triangulation process, the data collected becomes more reliable and accurate. The final stage of analysis is carried out by drawing conclusions from the patterns, relationships, and meanings that emerge from the overall data to provide a comprehensive picture of the application of basic principles of education and science trees in science literacy-based learning in elementary schools.

Results And Discussion

Content-Based Learning

The practice of science learning in primary schools is still in the shadow of the traditional paradigm that emphasizes the delivery of science in a positive way. *transfer of knowledge* (Lendeon 2022). The achievement of academic scores in learning still tends to be quantitative. Learning activities in the classroom are more dominant with mastery of abstract concepts through a memorization approach, so that the development of science process skills (PPP) and critical thinking skills have not been achieved properly and correctly (Latif et al., 2022). The results of observations conducted by the researcher show that the science subjects at SDN PLUMBON 2 school state that the conditions in learning still use lecture and question and answer methods. Of the total learning time of 70 minutes, about 45 minutes were used to explain material on changes in the shape of objects through support books (package books) and teacher-manual workbooks. After that, students carried out activities to record the information that had been conveyed by the teacher and answer the

questions asked orally. This condition indicates that educational orientation is still dominated by a cognitive-centric approach, the indicator of learning success is measured more by students' ability to answer exam questions than by students' capacity to apply science literacy in daily life. In this regard, science learning has not fully functioned as a means to shape contextual and applicative scientific ways of thinking (Firdha Yusmar 2023).

Ontologically, this phenomenon shows that scientific knowledge is still understood as something static, objective, and fixed (fixed body of knowledge) (Muliadi et al., 2022). This can be an innovation to minimize space for students to explore and develop curiosity. This view has implications for the epistemological aspect, where the learning process tends to take place teacher-centered (Hakiky et al., 2023), so that students play more roles as passive recipients of information than as subjects who actively construct knowledge contextually. This trend is in line with recent research findings that reveal that the dominance of content content in the curriculum often limits teachers' space to develop affective and psychomotor dimensions in science learning (Fadly 2020). As a result, learning not only loses the depth of the process, but also fails to integrate aspects of knowledge, skills, and attitudes in a balanced manner.

Based on the results of an interview with one of the teachers of grade IV SDN PLUMBON 2, it was stated that the success of learning is still measured based on students' ability to understand the material and obtain good scores on learning evaluation questions. Furthermore, simple experimental activities cannot be carried out regularly due to the limitation of very short learning time.

This, if examined from a philosophical perspective, the dominance of content-based learning orientation does not fully reflect the essence of education as a process of "humanizing" that should develop the full potential of students (Agung 20232). Ideally, education provides space for the growth of curiosity, concern for the environment, and reflective awareness. In reality, the field is still close to the Essentialism-Expository paradigm which emphasizes the delivery of core material through direct instruction.

From a psychological point of view, this approach is also not in harmony with the cognitive development stage of elementary school students who are in the concrete operational phase, students need direct experience to understand concepts in depth. In the context of global science literacy, this condition demonstrates the need for a fundamental shift from simply knowing "what" to a more comprehensive understanding of the "how" and "why" of a phenomenon (Nyoman and Putu 2024).

In this regard, these findings hint at the urgency of transforming learning towards an experiential learning approach as an effort to strengthen science literacy in a more meaningful way (Dewantari and Singgih 2020). Science literacy will not

develop optimally without the direct involvement of students in scientific practice, so learning needs to be designed as a lively and contextual process.

Strengthening science literacy in elementary schools can be analogized to the development of a "science tree" that is rooted in observation activities, grows through critical thinking, and produces fruit in the form of a scientific perspective that is solutive and adaptive to real problems (Dewi et al., 2022). Therefore, teachers are required to integrate constructivistic approaches that are able to bridge theoretical concepts in textbooks with the phenomena that students experience in their daily lives, so that learning becomes more relevant, in-depth, and sustainable (Widiastuti, Linora 2024).

Science Literacy-Based Learning Strategies

At the point of science literacy-based learning strategies, an observation at SDN PLUMBON 2 school stated that teachers have applied several variations of learning methods such as group discussions and questions and answers, but the implementation of learning is still procedural and oriented towards completing assignments, so that some students follow the teacher's instructions to solve problems without conducting a further exploration of existing phenomena. This is in line with the opinion Nurwidiyanti and Sari (2022) stating that in the world of education today, there is a phenomenon that can be described as a "paradigm shift," especially in learning practices at the elementary school level. Teachers began to rely not only on traditional lecture methods but also to use variations, such as discussions and group work, to create a more dynamic classroom atmosphere. However, these activities are procedural, with the background of following only instructions and not fully encouraging exploration that can stimulate students' deeper scientific knowledge. Therefore, even if students appear to be physically active, cognitive participation that can lead to a critical and reflective understanding of scientific literacy does not necessarily have a well-developed knowledge in the learning process.

Based on the results of an interview with one of the teachers in grade IV of SDN PLUMBON 2, it shows that the use of group discussions aims to increase students' activeness in the learning process, but there are still many teachers who admit that the enthusiasm for discussion has not completely directed students to investigate an existing phenomenon, but only to solve existing problems. There is a time limit in the learning process that is very short, so the focus is more on completing tasks in groups. Viewed ontologically, there is a tendency for the perspective of knowledge to be flexible, but its application in daily learning activities remains inconsistent and comprehensive (Ermida 2023). Scientific knowledge is often seen as absolute truth that must be achieved through fixed procedures, rather than as human constructs that are constantly changing through scientific processes.

From an epistemological perspective, the development of learning has indeed begun to shift towards a constructivist approach, but its nature remains limited because students are only given the opportunity to interact without fully engaging in the process of mastery of knowledge that reflects the scientific method (Lukman et al., 2026). This situation shows that the paradigm shift has not touched the core of how knowledge is formed and understood.

From a psychological and sociological perspective, student involvement in the learning process still tends to be behavioral and has not reached the level of in-depth thinking based on scientific knowledge (Zufar dkk., 2023). Although social interaction between study group members has been established, this is often limited to the division of tasks in completing the Student Worksheet, without meaningful discussion. In this case, the science class functions more as an "answer factory" than as a space for scientific dialogue and is developed collaboratively (Shana and Abulibdeh 2020). Therefore, teachers need to act as facilitators of thought who can ask stimulating questions and manage discussions that encourage the formation of deep and sustainable knowledge.

Implementation of the Science Tree

At the point of implementation of the science tree, an observation was obtained on social studies learning at SDN PLUMBON 2 school stating that science literacy learning has contained elements of knowledge, skills and attitudes, but these elements are still not systematically integrated. Teachers emphasize more on mastering concepts than on developing the practicality of the process and the scientific disposition of students. This is in line with his opinion Mailinda and Putri (2023) Science learning in elementary school is a knowledge base that becomes a provision in daily life. The learning process is still carried out separately, the application of character values as a basis is often not directly connected to the inquiry methods used in the classroom. This has an impact on learning outcomes in the form of students' science literacy competencies that have not been developed optimally because the "roots," "stems," and "fruits" in education do not support each other functionally. This situation shows that the elements of education have been formally present, the actual relationship between these elements is still weak and has not created an integrated system.

The results of the interviews that have been conducted show that teachers understand the importance of developing students' character and thinking skills in the science learning process, but in reality the field assessment of process skills and scientific attitudes has not been designed in detail in the learning instruments, so that the learning tools used still dominate the cognitive aspects of students. This, however, can be drawn from various foundations related to ontology, which shows that the understanding of the nature of science as a system that integrates scientific products,

processes, and attitudes is still limited (Nikmah et al., 2025). In practice, science is often narrowed down to a mere collection of facts that must be memorized, rather than a systematic and dynamic way of thinking (Mukti et al., 2022). The impact of this perspective can be seen in the epistemological dimension, learning has not yet formed a complete and continuous scientific cycle. Learning activities often stop at the observation stage without proceeding to analysis, evaluation, and evidence-based decision-making, so that the nature of the scientific method is not fully internalized (First dkk., 2023).

In line with this, from a philosophical perspective, the fundamental values of education have not been fully integrated into the daily learning process, so that the broader goals of education are often only the fulfillment of curriculum needs (Almuzani 2020). Ideally, science learning not only serves as a tool for transferring knowledge, but also as a means to develop awareness, gratitude, and responsibility for the environment. However, in practice, these aspects are still under-recognized. From an anthropological perspective, science education also does not sufficiently consider the local cultural context of students, so the knowledge gained feels less relevant and difficult to apply in daily life.

The impact of these findings emphasizes the importance of the role of teachers as the main designers in creating integrated and meaningful learning. The concept of the "knowledge tree" in primary education does not only serve as a theoretical idea, but needs to be implemented in clear and structured learning practices (Pratiwi et al., 2023). Teachers are expected to design a learning design that is harmonious, values and foundations (roots) function as the basis that strengthens learning strategies (stems), thereby maximizing science literacy and student competence (fruit) (Chandri dkk., 2024). Without such integration, science learning risks becoming just an administrative routine that loses its significance in shaping students' scientific thinking.

Science-Based Aspects and Character

At the point of science-based aspects and characters, an observation result in class IV science learning shows that most students show enthusiasm when participating in learning. However, the curiosity shown by students is still relatively low. This is in line with the opinion Dariansyah et al. (2023) The strengthening of science literacy skills at the elementary school level is still experiencing imbalances, especially in the affective aspect, which has not yet fully developed (Dariansyah et al., 2023). Field findings show that students are more focused on achieving "correct answers" to meet academic standards, but have not demonstrated scientific dispositions such as curiosity, perseverance, and the ability to reflect on themselves (Shah et al., 2023). Mechanically inclined learning patterns also play a role in the loss of the core of the inquiry process, as critical thinking is often replaced by a focus on

practical outcomes. This situation shows that science teaching has not fully developed a scientific attitude as an integral part of science literacy.

Based on the results of the interviews, it shows that students tend to focus more on the results of the evaluation than on the learning process. Viewed from an axiological perspective, it shows that scientific understanding has not been fully integrated into students (Amrullah et al., 2025). From a psychological perspective, this shows that students' intrinsic motivation has not developed well, because the learning environment does not fully support the growth of a culture of critical and reflective thinking(Pantow and Korompis 2024). Science learning focuses more on the cognitive aspect than on the reinforcement of attitudes and values that should accompany it. Holistically, science literacy must include affective aspects so that students not only develop intellectual abilities but also care about scientific issues in the surrounding environment (Syahidi et al., 2023).

Furthermore, the weak development of scientific character is greatly influenced by sociological factors in the classroom that do not support the formation of reflective habits (Widyastika and Wahyuni 2022). Students are still rarely involved in reflecting on the thoughts and knowledge gained, especially when answering questions about "how" a conclusion is reached, so that the learning process loses its profound philosophical aspect (Supena and Hariyadi 2021). The impact of this situation requires a change in the learning evaluation system, so that it not only emphasizes mastery of the material, but can also assess the development of students' scientific attitudes, curiosity, and reflective abilities. Therefore, strengthening the "roots" in basic education needs to be directed at the habit of reflection as the main foundation, so that scientific literacy is not only an academic skill, but also internalized as a character in students' lives.

Implementation of Science-Based Education Curriculum

At the point of application of the science-based education curriculum, an observation on science learning shows that learning evaluation is dominated by multiple-choice questions and descriptions that measure an understanding of concepts, while the assessment of science process skills and scientific disposition is carried out in a systematic manner. In line with his opinion Humaira, et al., (2022) The educational curriculum essentially offers teachers the opportunity to develop learning that focuses on scientific literacy, but in practice, many are still stuck in conventional methods. However, observations show that there are significant differences between the independent Curriculum policy design and its implementation in the classroom. Teachers often feel more comfortable using a more administrative and structured approach rather than exploring the student's potential (Ndari and Mahmudah 2023). This situation shows that there are changes at the policy level, transformations in learning practices have not been fully fulfilled.

Based on the results of an interview with one of the teachers of grade IV of SDN Plumbon stated that teachers still use test scores and assignments as the main indicators in measuring the success of the learning process. This gap is becoming more and more evident from an epistemological perspective, there is a clash between the constructivist paradigm introduced by the Independent Curriculum and the learning practices that are still bound On a behaviorist approach (Lukman et al., 2026). This curriculum encourages students to actively build knowledge through learning experiences, but in practice, knowledge is still seen as something that is transferred directly from teacher to student (Salamah et al., 2024). Therefore, the learning process does not fully reflect the core of constructivism, which places students as active individuals in developing understanding (Tishana dkk., 2023). This reinforces the indication that the paradigm shift is still happening incompletely.

From a sociological perspective, these barriers are closely related to strong administrative pressures and a school culture that does not fully support innovation. The high burden of documentation often distracts teachers' attention and energy, shifting the focus of learning from improving scientific literacy to meeting bureaucratic demands (Hidayat et al., 2024). These findings are in line with Harefa's research in 2023 with the title "*Implementation of Scientific Inquiry Approach for Enhancing Scientific Literacy among Elementary Students"* which shows that accountability pressures are often the main obstacle in implementing inquiry-based learning methods in elementary schools (Harefa 2023). As a result, the opportunities to experiment and develop meaningful learning strategies are increasingly limited.

In addition to external factors, psychological aspects play an important role in explaining this discrepancy, especially regarding teachers' resilience to change. Many teachers still need a sense of security and confidence to switch from the old method to a newer approach (Istiqomah et al., 2025). Without this mental readiness, curriculum changes can become mere administrative changes without providing meaningful results on the quality of learning. Therefore, as Miller and Smith (2024) point out, teachers' readiness to face curriculum changes is highly dependent on ongoing support, not just temporary training.

The implications of these findings suggest that efforts to improve education cannot stop at the macro policy level but must be balanced with implementation strategies related to hands-on practice in schools. Reinforcement is needed through training that is not only technical but also addresses the philosophical aspects of the "knowledge tree," which is supported by intensive guidance during the implementation process (Fatmawati et al., 2025). The main focus should be directed to changing the teacher's mindset so that students view the curriculum as a tool to empower students' thinking processes, especially in developing critical, reflective, and contextual scientific literacy.

Conclusion

This research shows that the implementation of science literacy-based learning at SDN Plumbon 2 has accommodated several basic principles of education by connecting learning materials with students' real experiences and providing opportunities for discussion during the learning process. However, learning practices are still dominated by a teacher-centered, material-mastery-oriented approach, and using cognitive evaluation results as the main indicators of learning success. This condition results in the development of scientific process skills, scientific thinking skills, and students' scientific disposition that has not been developed optimally.

Viewed from a multifaceted perspective, the implementation of philosophical, sociological, anthropological, and psychological foundations in science literacy-based learning has not been integrated. Ontologically, knowledge is still positioned as a fact that is transmitted to students, while epistemologically, the learning process has not fully provided space for students to build knowledge through investigation, observation, reflection, and scientific investigation. Furthermore, the concept of the science tree has not been systematically implemented as a framework that connects the foundation of education (roots), learning processes (stems), and the achievement of science literacy (fruit).

The conceptual contribution of this research lies in the development of an analytical perspective that integrates the basic principles of education, ontological and epistemological dimensions, and the concept of the science tree in evaluating the success of science literacy learning in elementary schools. In contrast to previous research that generally assesses the success of science literacy based on the mastery of concepts or the effectiveness of learning models, this study shows that the success of science literacy needs to be understood as an integration between the foundation of education, the process of knowledge construction, and student achievement which includes cognitive aspects, process skills, and scientific disposition. This integrative perspective is expected to serve as a conceptual reference for teachers, schools, and researchers in designing science literacy learning that is more meaningful, contextual, and oriented towards 21st century competency development.

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