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Strategies for Enhancing Young Children's Scientific Inquiry Skills

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Abstract: In recent years, with the continuous advancement of educational reform, the importance of scientific education in early childhood has become increasingly evident. Early childhood is a critical period for cognitive development and interest cultivation. Through scientific inquiry activities, young children’s cognitive development, problem-solving abilities, and curiosity about the surrounding world can be effectively promoted. However, the implementation of early childhood scientific inquiry education still faces numerous challenges, such as a lack of systematic theoretical guidance and insufficient strategies for improvement. This study aims to enhance the existing theoretical foundations of young children's scientific inquiry abilities and proposes specific strategies for improvement to foster the comprehensive development of children's scientific literacy.

Keywords: Young Children’s Scientific Inquiry Skills; Theoretical Foundation; Enhancement Strategies.

1. Introduction

Scientific inquiry is a process involving the formulation of questions, collection of data, analysis of information, and the drawing of conclusions. It is embedded in various fields, including science, society, and everyday life [1, 2]. With the rapid development of society, individuals are expected not only to master existing knowledge but also to have the ability to explore unknown areas and solve complex problems [3]. Scientific inquiry, driven by curiosity, is not only the core of scientific research but also a crucial approach to individual cognition and learning [4]. Through scientific inquiry, individuals can acquire knowledge and develop critical thinking and innovation skills, which are essential in modern society [5, 6].

Early childhood scientific inquiry refers to young children's exploration behaviors during the early stages of development, which are manifested through observation, experimentation, and hypothesis testing [7]. At this stage, inquiry activities are characterized by strong curiosity and active exploratory behaviors [8]. Through scientific inquiry, young children not only acquire knowledge but also learn the process of questioning, testing hypotheses, analyzing results, and drawing conclusions [9]. This systematic cognitive training lays a solid foundation for their cognitive development, particularly in developing logical thinking, understanding cause-and-effect relationships, and fostering critical thinking [10]. Early education plays a crucial role in cognitive development, especially during the brain's rapid growth period. Through hands-on activities, observation, and experiments, scientific inquiry activities can effectively stimulate young children's curiosity and desire to learn [11]. Studies have shown that young children can significantly enhance their logical thinking and problem-solving abilities through inquiry activities [12] while also developing social skills during cooperative learning [13].

However, despite the growing global attention to early childhood scientific inquiry education, existing research and practice still have significant gaps. For instance, specific strategies for enhancing young children's scientific inquiry skills remain unclear, resulting in the limited realization of educational outcomes. Therefore, this study aims to deeply explore strategies for enhancing young children's scientific inquiry abilities from both theoretical and practical perspectives, providing educators with guidance to promote the comprehensive development of children's scientific literacy.

2. Theoretical Foundations for Cultivating Young Children's Scientific Inquiry Skills

2.1. Piaget’s Theory of Cognitive Development

Piaget posited that young children interact with their environment through two processes: assimilation and accommodation, gradually adjusting and reorganizing their cognitive structures to build new knowledge systems [14]. Assimilation refers to the process by which children incorporate new experiences into their existing cognitive structures, whereas accommodation occurs when new experiences cannot be explained by their current cognitive structures, leading children to adjust and expand their cognitive frameworks. Through this dynamic interchange, children gradually form an understanding of the external world. Piaget emphasized that learning is an active process in which children construct their understanding of the world through interactions with both their physical and social environments [15].

In the sensorimotor stage (0-2 years), children interact with their environment through sensory experiences and physical actions. The primary cognitive achievement of this stage is the development of “object permanence,” the understanding that objects continue to exist even when they are not perceived. Scientific inquiry activities at this stage should focus on sensory stimulation and hands-on activities to help children understand the physical world around them. The preoperational stage (2-7 years) is marked by children’s use of imagery and intuitive thinking to understand objects, although their thinking remains egocentric—they have difficulty considering things from another’s perspective. At this stage, children can use symbols and language to express ideas but have not yet developed complex logical operations.

Scientific inquiry activities at this level can include games and role-playing that stimulate children's curiosity and help develop their symbolic expression abilities.

The concrete operational stage (7-11 years) is a key period for cognitive development, during which logical thinking gradually strengthens. At this stage, children understand the concept of conservation and develop basic skills in classification and ordering. In scientific inquiry, teachers can design concrete experiments that allow children to explore basic scientific principles through observation, classification, and simple reasoning. In the formal operational stage (11 years and above), children's cognitive abilities become more advanced, allowing for abstract thinking and hypothetical reasoning. They can not only solve concrete problems but also think about and understand abstract concepts. Scientific inquiry activities at this stage can include designing complex experiments and encouraging children to test hypotheses and engage in deductive reasoning, further enhancing their scientific thinking abilities. Therefore, appropriate scientific inquiry activities should be designed based on the cognitive level of children, enabling them to develop inquiry skills in an adaptive environment.

2.2. Vygotsky's Sociocultural Theory

Vygotsky argued that children's cognitive development depends not only on individual activities but also on social interactions and support from the cultural environment. His concept of the "zone of proximal development" (ZPD) highlights that, with appropriate external support, children can accomplish tasks beyond their independent abilities [16]. Through assistance from knowledgeable adults or peers, children can exceed their current knowledge and skill levels and grasp more complex concepts and phenomena during scientific inquiry activities. Vygotsky emphasized that learning takes place within a sociocultural context, where social interaction plays a key role in children's cognitive development. Through communication with teachers or peers, children can share their observations and conclusions and adjust their thinking based on feedback from others. Scientific inquiry relies not only on independent observation and thinking but also on communication and collaboration to deepen the understanding of scientific concepts [17]. Support from teachers or peers helps children continuously optimize their thinking processes during scientific inquiry activities, allowing them to progressively master more complex scientific concepts and phenomena.

Moreover, in Vygotsky's theory, language is considered a core tool for cognitive development. Language is not only a means of expression but also a critical tool for organizing and regulating thought processes [18]. Through language, children can better articulate and externalize their thinking processes. Teachers can facilitate this by asking questions and guiding discussions to help children deepen their understanding of scientific inquiry. Additionally, peer interactions through language enable children to share their observations and insights with one another, further internalizing scientific concepts.

Scaffolding, a key extension of Vygotsky's theory, emphasizes that teachers should provide gradually diminishing support based on the child's abilities, helping them eventually complete tasks independently [19]. In scientific inquiry, teachers can break down complex tasks, pose key questions, and provide experimental tools to help children make progress within their ZPD. As children gradually master basic inquiry skills, teachers can reduce their assistance, encouraging the children to solve more complex scientific problems on their own. This gradual reduction of support helps children develop independent thinking and problem-solving skills during the inquiry process. Vygotsky's theory demonstrates that mastering scientific concepts is an interactive and progressive process that requires social interaction and systematic education. During scientific inquiry, the support of teachers and the cooperation of peers can significantly enhance children's inquiry abilities, enabling them to achieve greater progress in understanding scientific phenomena and solving complex problems.

2.3. Constructivist Theory

Constructivist theory, derived from the ideas of Piaget and Vygotsky, emphasizes that learning is an active process in which individuals construct knowledge through interactions with their environment and society [16]. Piaget believed that children's cognitive development results from the continuous adjustment of cognitive structures through assimilation and accommodation, while Vygotsky highlighted the significance of social and cultural contexts in the learning process [15, 20]. His concept of the "zone of proximal development" (ZPD) suggests that with the support of adults or peers, children can exceed their current abilities and complete more complex tasks, providing a theoretical basis for cooperative learning [16]. Jerome Bruner further developed constructivist thought with his concept of "discovery learning." Bruner posited that learners should acquire knowledge through active exploration and problem-solving, rather than passive reception [21]. In early childhood scientific inquiry, children design experiments, observe outcomes, and reflect on the process, gradually forming an understanding of scientific phenomena, which promotes independent thinking and problem-solving abilities [19, 22].

Bruner's three modes of representation—enactive, iconic, and symbolic—provide a framework for understanding how children learn [23]. In scientific inquiry activities, children first engage in enactive representation, such as hands-on experiments to perceive scientific phenomena. Then, through iconic representation, such as drawing observations, they transform concrete experiences into visual information. Finally, they use symbolic representation, such as verbal explanations or symbolic recording, to deepen their understanding of scientific concepts [24]. This self-discovery learning approach not only enhances children's engagement but also fosters their critical thinking abilities. Through direct experience and reflection, children can hypothesize, test guesses, and analyze results, thus improving their independent thinking [5]. Additionally, constructivist theory underscores the importance of cooperative learning. In interactions with peers, children share and discuss their observations, collaboratively constructing an understanding of scientific phenomena. This not only facilitates the internalization of scientific concepts but also helps develop children's social skills and teamwork abilities [25, 26].

2.4. Experiential Learning Theory

David Kolb's experiential learning theory asserts that learners deepen their knowledge through the "experiential learning cycle," which comprises four interrelated stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation [27]. This process is dynamic and cyclical, with learners continuously revising and deepening their cognitive systems through reflection and experimentation [28]. In the concrete experience stage, children acquire initial sensory experiences through direct action and interaction with their environment. For example, in a plant growth experiment, children may gain hands-on experience by planting, watering, and recording the growth of plants. Scientific inquiry activities at this stage should focus on providing rich sensory stimulation and hands-on practice, allowing children to establish direct connections with scientific phenomena [2]. In the reflective observation stage, children review and analyze their concrete experiences, beginning to think about the phenomena they observed during the experiment [29]. For instance, in the plant growth experiment, children may reflect on how varying conditions such as light and water influenced the plant's growth. This reflection not only allows children to summarize their experiences but also stimulates new questions or hypotheses, fueling their interest in further inquiry [30].

Following reflection, children enter the abstract conceptualization stage, where they integrate their experiences with theoretical understanding, forming preliminary scientific concepts or hypotheses [27]. In the plant growth experiment, for instance, children may hypothesize about the influence of light and water on plant growth, leading them to make predictions such as, "Will increased light make the plant grow faster?" In the active experimentation stage, children design new experiments to test their hypotheses. For example, they might alter the growth conditions of the plants, such as changing light exposure or water levels, to observe how these variables affect plant growth. This stage not only allows children to verify their hypotheses but also stimulates further thinking and experimentation, initiating a new learning cycle [31]. Kolb also emphasized the importance of individual differences in the learning process. Children may show preferences for different stages of the experiential learning cycle—some excelling in hands-on tasks, while others prefer reflecting or constructing theories [32]. Therefore, when designing scientific inquiry activities, teachers should offer a variety of learning opportunities that cater to the children's diverse learning styles, ensuring that each child can maximize their potential in the stages where they are most adept.

3. Strategies for Enhancing Young Children's Scientific Inquiry Skills

3.1. Experiential Inquiry-Based Learning Strategy

By engaging children in hands-on activities and sensory experiences, this strategy aims to help young children understand scientific phenomena through direct experience, thereby enhancing their inquiry skills. This strategy supports teachers in designing and implementing inquiry-based activities tailored to the cognitive characteristics of young children, fostering active participation and reflective thinking in science learning. To further enhance the flexibility and scalability of this strategy, teachers should adapt activities according to different teaching scenarios, ensuring that each child benefits from the experiences.

3.1.1. Hands-on Activities as the Core of Scientific Inquiry

Hands-on activities are a crucial approach to scientific inquiry for young children. Teachers should design developmentally appropriate experiments that involve guided questioning, observation, and active manipulation of materials, helping children discover and understand scientific phenomena within concrete contexts. These activities should align with children's interests and developmental stages, such as floating and sinking experiments, plant observation, and building balanced structures. Through these activities, children gain a direct understanding of scientific concepts by engaging in physical actions. Teachers can guide children in designing experiments to spark curiosity and initiative. For example, in plant experiments, teachers might prompt children to select different growth conditions (such as light exposure and water levels), helping them grasp basic principles of plant growth. After the experiment, teachers should facilitate discussions and reflection through guided questions, such as "Why did this object sink while the other floated?" Additionally, teachers should provide personalized support by designing differentiated tasks that cater to children's varying abilities. For more advanced learners, teachers can create more complex experiments, while for children who need more assistance, simpler and more structured guidance should be provided. Teachers should also implement continuous assessment and feedback mechanisms to track children's performance and adjust teaching plans based on their progress.

3.1.2. Experiences to Promote Initial Scientific Understanding

Sensory experiences are a vital part of scientific inquiry for young children. Teachers should design diverse sensory activities that integrate visual, auditory, tactile, and other sensory experiences with specific scientific concepts, helping children develop a sensory-based understanding of scientific phenomena. Teachers should also consider the individual differences among children by designing activities with varying levels of difficulty, ensuring that each child gains meaningful learning experiences. Providing materials with different properties (such as metal, wood, and fabric), for instance, allows children to touch and perceive differences in temperature, hardness, and weight. Teachers can guide children through questions about material properties, such as "Why does metal feel cooler than fabric?" Additionally, sensory experiments involving sound, where children strike different materials to observe variations in volume and pitch, can further deepen their understanding of sound transmission and its effects. Teachers should use assessment tools to monitor children's sensory experiences and provide timely feedback to improve their observation and sensory processing skills. Expanding the scope of sensory activities, such as through olfactory experiences with plants or observing how light affects color changes, can further enrich children's understanding of a wider range of scientific phenomena and promote the development of scientific thinking.

3.1.3. Integrating Natural Phenomena with Inquiry-Based Learning

Teachers should fully utilize outdoor resources to help children observe and experience real-life natural phenomena (such as light, wind, and water) to understand basic scientific principles. These outdoor inquiry activities connect children's daily lives with science learning, enhancing their awareness of the natural world around them. To strengthen the effectiveness of collaborative learning, teachers can incorporate group tasks into outdoor activities, encouraging children to work together to solve problems. For example, in outdoor activities where children observe the changing shadows under sunlight or feel the direction and strength of the wind, teachers can guide them in exploring phenomena such as the interaction of light and objects or the flow of air. To foster cooperative learning, teachers can assign different roles (such as observer or recorder) to children, guiding them to work together to complete inquiry tasks. By encouraging children to ask questions like "Why does the shadow change over time?" or "How does the wind affect the movement of leaves from different directions?" teachers can help them understand scientific concepts in real-world environments and develop both their scientific thinking and collaborative inquiry skills.

3.2. Strategies for Developing Language Expression and Externalizing Scientific Concepts

By using language and symbolic representation, these strategies aim to help young children externalize their thinking during scientific inquiry, enhancing their language expression skills while deepening their understanding of scientific concepts. Language and symbolic expression are crucial components of scientific learning. By encouraging children to articulate their observations and reasoning through language and symbols, teachers can facilitate their grasp of scientific concepts while stimulating their communication skills and scientific thinking.

3.2.1. Observation and Description: From Perception to Expression

After scientific inquiry activities, teachers should guide children to describe their observations and experimental processes using simple vocabulary. Through verbal descriptions, children can clarify their observations and deepen their understanding of scientific phenomena. Describing the process helps children organize their inquiry and gradually externalize their inner thinking into outward expressions, facilitating their transition from perception to scientific concepts. Teachers can prompt children with interactive questions to describe their observations. For example, “What did you see?” “How did this experiment happen?” “What was the result?” These questions help children organize their thoughts and articulate them clearly. At the same time, teachers should encourage children to use scientific vocabulary, such as “temperature,” “weight,” and “floating,” fostering their sensitivity to scientific language. Teachers may also use interactive feedback mechanisms to stimulate children’s willingness to express themselves, for example, “Can you tell me what your friend saw?” This method helps improve children's language expression skills and fosters a deeper understanding of scientific phenomena.

3.2.2. Oral Narration and Scientific Reasoning: Externalizing Thought

Through oral narration, children can articulate their discoveries and reflections during scientific inquiry. Narration and explanation activities help children organize their thoughts and verbalize their reasoning processes clearly. Teachers should encourage children to gradually transition from mere observation descriptions to deeper levels of scientific reasoning through oral narration. Teachers can set up sharing sessions where children explain their experimental processes and results using their own words. By asking progressive, guided questions, teachers can lead children from “What did you see?” to “Why did this happen?” and further encourage them to reflect with questions like “What do you think this phenomenon explains?” This type of questioning helps children move from basic descriptions to more complex reasoning, enhancing their logical thinking skills. By incorporating visual aids, such as charts or drawings, children can use visual tools to support their oral narration, further enhancing their language expression and scientific reasoning.

3.2.3. Group Discussions and Collaborative Expression: Cooperative Scientific Thinking

Group discussions provide children with opportunities for communication and collaboration. Through interaction with peers, children can share their observations and collaboratively solve problems through cooperative learning. Collaborative expression not only helps children broaden their understanding of scientific phenomena through others’ perspectives but also fosters their social and communication skills. Teachers should design group discussion activities in which children share their observations after experiments and discuss the discoveries and issues they encountered. Teachers can ask guiding questions, such as “What commonalities did you find?” “What can you infer from these phenomena?” Through cooperative discussions, children can gain a multi-perspective understanding of scientific phenomena while learning to collaborate to solve problems. In the process of cooperative learning, children can draw on others' ideas, propose new hypotheses, and pose additional questions during discussions, further developing their critical thinking skills.

3.2.4. Storytelling and Role-Playing: Contextualized Scientific Expression

By integrating storytelling and role-playing, children can explore scientific phenomena in engaging contexts, incorporating scientific concepts into familiar storylines or role-play activities. Storytelling and role-playing help children connect scientific phenomena to real-life experiences, stimulating their creative thinking while providing a contextual platform for externalizing scientific understanding. Teachers can introduce scientific concepts through storytelling, such as “The Life Cycle of a Plant” or “The Water Cycle,” and encourage children to role-play as scientists, plants, or other relevant characters to conduct "hypotheses" and "experiments" through role-playing. During role-playing, children can express their understanding of scientific phenomena through interactive simulations, while expanding their language and reasoning skills through discussion and sharing. Role-playing makes scientific inquiry more engaging and vivid, allowing abstract scientific concepts to become more concrete, helping children grasp complex scientific phenomena in a relaxed context.

3.3. Strategies for Integrating Scientific Concepts into Daily Life

In kindergarten, integrating scientific phenomena with daily life experiences can effectively cultivate children's scientific inquiry thinking. Since children's cognitive development is still in its early stages, their thinking mainly relies on intuition and concrete experiences, making it challenging for them to grasp abstract scientific concepts. However, by incorporating scientific phenomena into everyday activities, children can gradually accumulate basic scientific knowledge in real-life contexts. For example, in kindergarten's daily activities, children can naturally encounter scientific exploration through playing with water, touching materials of different textures, or observing changes in the weather. Simple activities such as watching ice melt into water, feeling temperature differences between objects, or noticing the color changes of leaves with the seasons all offer great opportunities to introduce natural science concepts to children.

Additionally, teachers can design hands-on activities closely related to daily life to embed scientific concepts. For instance, during cooking activities, children can observe how ingredients change from solid to liquid when heated or witness water evaporation, learning about the changes in the states of matter. In gardening activities, children learn about plant growth by planting and taking care of them, understanding life cycles and photosynthesis as basic scientific knowledge. Even in routine tasks like cleaning or sorting objects, teachers can guide children to classify items by color, shape, or size. This not only develops practical life skills but also introduces them to foundational scientific concepts like classification and pattern recognition.

These science-related activities, closely tied to children's daily lives, are engaging and help them gradually build a basic understanding of scientific phenomena in a relaxed environment, laying a foundation for future scientific learning. By connecting scientific phenomena with children's daily life experiences, this strategy helps them cultivate scientific inquiry thinking while enhancing their scientific cognition and problem-solving skills through observation, manipulation, hypothesis, and verification. Since children's thinking mainly relies on intuition and concrete experiences, they may struggle to comprehend abstract scientific concepts. By integrating scientific phenomena into their daily lives, children can accumulate scientific knowledge in real-world contexts. Teachers should fully utilize natural phenomena and everyday activities to create scientific learning opportunities, encouraging children to observe, discuss, and reflect on the scientific principles behind these experiences through guided questioning and interaction.

3.3.1. Observing Natural Phenomena: Scientific Insights from Everyday Life

Teachers play a crucial role in helping children connect their everyday experiences with scientific concepts. By guiding children to observe natural phenomena, such as wind, light and shadow, and weather changes, teachers can spark their curiosity and promote critical thinking. These natural phenomena offer ideal opportunities for children to explore and understand basic scientific principles. For instance, teachers can use reflective and open-ended questions to guide children, which not only deepens their understanding of natural phenomena but also fosters inquiry-based thinking and problem-solving skills.

Outdoor activities are especially effective in enhancing learning experiences. When children are outdoors, they encounter various natural elements that can stimulate their curiosity. Teachers can encourage children to notice the direction of the wind blowing through the leaves, the changing lengths of shadows throughout the day, or patterns in the weather, such as how clouds affect temperature or light. By asking questions like “Where do you think the wind is coming from?” or “Why is today’s shadow shorter than yesterday’s?” teachers can guide children to reflect on their observations and try to explain what they have seen. These questions prompt children to think actively about the scientific principles behind their everyday experiences, transforming casual observations into valuable learning moments.

Through engaging with these natural phenomena, children gradually grasp scientific concepts in a concrete way. For example, by observing changes in shadows and light throughout the day, they can begin to understand the concept of time and the relationship between the sun’s position and the shadows. Similarly, experiencing changes in wind direction and temperature can lead children to form early hypotheses, exploring weather patterns and atmospheric conditions. By engaging in sensory learning, children can build a foundation for scientific understanding that aligns with their developmental stage.

3.3.2. Participating in Everyday Activities: Hands-On Scientific Understanding

In daily life, teachers can play a crucial role in guiding children to understand the processes of material changes through interactive and hands-on activities, thus enhancing not only their motor skills but also their foundational scientific knowledge. These activities create a natural bridge between everyday experiences and scientific learning, making abstract concepts more accessible to young learners. For instance, when watering plants, teachers can encourage children to observe the gradual growth of the plants over time. Through continuous observation and participation, children can witness how water and sunlight contribute to plant growth, providing a real-world context for understanding concepts like photosynthesis and the water cycle. By asking thought-provoking questions such as “What happens if we don’t water the plants?” or “Why do plants grow towards the sunlight?”, adults can stimulate children's curiosity and prompt deeper thinking about the natural world, fostering early inquiry skills.

Similarly, during routine activities like handwashing, children can be encouraged to explore the formation and disappearance of soap bubbles. By allowing them to experiment with different amounts of soap and water, they can begin to grasp the concept of surface tension and how air interacts with liquids. Teachers can enhance this learning experience by prompting children with questions like, “What do you notice about the size of the bubbles?” or “What happens when you blow gently versus when you blow harder on the bubbles?” These questions not only promote observational skills but also help children form hypotheses and test their ideas, laying the groundwork for scientific reasoning.

Expanding on these basic activities, teachers can introduce more complex experiments that build on children’s prior knowledge. For example, they can guide children in setting up small experiments to see how plants grow under different conditions, such as varying amounts of water or sunlight. This can lead to discussions about variables, predictions, and outcomes, helping children develop critical thinking and an understanding of cause and effect. In the case of soap bubbles, adults can encourage children to try making bubbles using different solutions, like dish soap or shampoo, to observe which creates the largest bubbles, thereby introducing the concept of experimentation and comparison.

3.3.3. Hypotheses and Reasoning: From Hypothesis to Experiment

Teachers should encourage children to make hypotheses about the phenomena they observe and design simple experiments to verify them through guided questions. In this process, children can learn the basic methods of scientific inquiry and develop their logical reasoning abilities. Teachers can guide children to propose hypotheses and test them through experimentation. For instance, they might ask, “If I water this plant twice a day, will it grow faster than if I only water it once?” Then, through experimental design, teachers can help children observe the growth conditions of different plants to verify their hypotheses. Through this process of experimentation and verification, children can better understand scientific principles while developing critical thinking through hypothesis and reasoning. By refining these strategies, children can accumulate knowledge of scientific phenomena both in the classroom and in everyday life, fostering their scientific thinking and inquiry skills. These strategies not only take into account children’s cognitive characteristics but also promote their language expression, reasoning abilities, cooperative learning, and critical thinking through various teaching methods.

4. Conclusion

In conclusion, enhancing young children's scientific inquiry skills requires a combination of theoretical foundations and practical strategies that meet their developmental needs. Through experiential learning, language expression, and the application of real-life contexts, teachers can effectively cultivate children's curiosity, critical thinking, and problem-solving abilities. Hands-on inquiry-based approaches encourage active participation in exploring scientific concepts, while collaborative activities promote social interaction and deeper understanding. Additionally, integrating scientific phenomena into everyday life, through observing natural phenomena or participating in daily tasks, provides meaningful contexts for children to understand abstract scientific principles.

By guiding reflection, proposing hypotheses, and verifying experiments, children gradually develop foundational scientific knowledge and reasoning skills, laying a solid foundation for future learning. Strategies that revolve around children's natural curiosity and cognitive development not only enhance their scientific literacy but also help them develop important life skills such as collaboration, communication, and critical thinking. Teachers play a key role in this process by supporting children's learning through guided questioning and structured activities. By continuously refining and implementing these strategies, young children's scientific inquiry skills can be improved, better equipping them to face the challenges of a rapidly changing world.

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