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IMPLEMENTATION OF NATURAL AND SOCIAL SCIENCES LEARNING IN THE INDEPENDENT CURRICULUM: ANALYSIS OF AN INTEGRATIVE APPROACH AND ITS IMPLICATIONS FOR ELEMENTARY SCHOOL STUDENT COMPETENCIES

Devi Anggi Friani [1] , Athanasia Dian Setiati [2]
[1 ,2] Doctoral Nugroho University Magetan
Email : devianggifriani@gmail.com, athanasiadiansetiati@gmail.com

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Abstrak

This study examines the implementation of Natural and Social Sciences learning as integrative subjects in the Independent Curriculum at the elementary school level. The transformation from separate learning of Natural and Social Sciences to a single subject of Natural and Social Sciences marks a paradigm shift in science and social education in Indonesia. This study aims to analyze the characteristics of Natural and Social Sciences learning, identify implementation challenges, and explore its impact on student competency development. The research method used a qualitative approach with literature review techniques and curriculum document analysis. The results show that Natural and Social Sciences learning emphasizes a scientific approach, inquiry-based learning, and contextualization of knowledge with students' daily lives. The implementation of this integrative learning faces challenges in terms of educator readiness, availability of learning resources, and understanding of the holistic learning philosophy. However, this integrative approach has the potential to develop students' critical thinking skills, creativity, and comprehensive understanding of natural and social phenomena. The study's conclusions emphasize the importance of systemic support in the form of educator training, provision of adequate teaching materials , and development of assessment models appropriate to the characteristics of integrative Natural and Social Sciences learning

INTRODUCTION

Science and social science education in Indonesia has undergone significant transformation through the implementation of the Independent Curriculum, which has

been gradually implemented since 2022. One of the fundamental changes in this curriculum is the merging of Natural Sciences and Social Sciences subjects into one unit called Natural and Social Sciences, especially for elementary school level (Andreani & Gunansyah, 2023). This policy reflects the government's efforts to create more holistic and integrative learning, and is relevant to the needs of students in the 21st century.

The integration of science and social learning is not a new phenomenon in global education discourse. Various countries have developed similar approaches considering that real-life phenomena cannot be understood separately from natural and social aspects. Humans live in a complex ecosystem where physical, biological, and social aspects interact to shape the reality of life. Therefore, learning that rigidly separates natural and social knowledge is considered not to reflect the integrity of the reality faced by students.

The Natural and Social Sciences learning paradigm carries the philosophy of social constructivism which emphasizes that knowledge is built through the interaction of students with their natural and social environment. This approach is in line with the development of contemporary learning theories that advocate meaningful, contextual, and experience-based learning (Azizah et al., 2025). In this context, students are no longer seen as passive recipients of information, but rather as active subjects who construct understanding through exploration, investigation, and reflection on the phenomena around them.

The implementation of Natural and Social Sciences in elementary schools is particularly urgent given the concrete operational phase of cognitive development among elementary school- aged students. In this phase, students build conceptual understanding through direct experience with concrete objects and phenomena. Integrated learning enables students to understand the causal relationship between natural phenomena and their implications for social life, or conversely, how human activities affect the condition of the natural environment.

However, the transition from a separate learning system to integrative learning of Natural and Social Sciences presents various implementation challenges. Educators who are accustomed to separate learning need to adapt in designing learning that coherently integrates science and social content. In addition, the availability of learning resources that support integrative learning is still limited, while the assessment system needs to be adjusted to be able to measure competency achievement holistically (Astuti & Annajmi, 2024).

Based on this background, this research is relevant to examine in depth how Natural and Social Sciences learning is implemented in elementary schools, the challenges faced, and its impact on student competency development. This research is expected to provide theoretical contributions to the development of integrative learning concepts and practical contributions in the form of recommendations for improving the implementation of Natural and Social Sciences learning in the field.

LITERATURE REVIEW

Integrative Learning Concept

Integrative learning is a pedagogical approach that organizes the curriculum by connecting various disciplines or domains of knowledge into a coherent learning unit. Fogarty suggests that curriculum integration can be implemented at various levels, from integration within a single discipline to integration across disciplines (Haris, 2021). In

the context of the Natural and Social Sciences, the integration undertaken falls into the category of multidisciplinary integration, where multiple perspectives from different disciplines are used to examine the same theme or phenomenon .

The philosophical basis of integrative learning is based on the view that knowledge is essentially holistic and interconnected. Dewey emphasized the importance of learning based on real experiences and authentic problem solving, where students use knowledge from various sources to understand and solve complex problems (Mutmainah et al., 2025). This perspective is in line with the 21st-century learning approach that prioritizes the development of higher-order thinking skills, collaboration, and the application of knowledge in real-world contexts.

Characteristics of Science and Social Learning in Elementary Schools

Science learning in traditional elementary schools emphasizes mastery of basic concepts of physics, biology, and chemistry through experimental and observational approaches. Meanwhile, social studies focuses on understanding society, culture, history, geography, and economics. Despite having different content focuses, both have similarities in terms of learning approaches that emphasize inquiry, exploration, and knowledge construction.

Driver states that effective science learning in elementary schools must start from students' initial conceptions and provide opportunities to test and revise their understanding through empirical investigation (Laspita, 2024). Likewise, meaningful social learning requires active student involvement in exploring social phenomena, analyzing multiple perspectives, and developing a critical understanding of societal issues.

Independent Curriculum and Natural and Social Sciences Learning

The Independent Curriculum was developed in response to the evaluation of the implementation of the previous curriculum and as an effort to improve the quality of learning in Indonesia (Barlian & Solekah, 2022). One of the main principles of the Independent Curriculum is to provide flexibility to educators in designing learning that suits the needs and context of students. In this context, Natural and Social Sciences are designed as subjects that facilitate students to understand themselves and their surroundings holistically.

The Natural and Social Sciences learning outcomes in the Independent Curriculum are organized based on elements that encompass an understanding of living things and their environment, matter and its properties, energy and its changes, and the Earth and the universe for the science domain. Meanwhile, the social domain encompasses an understanding of humans and their social environment, time and change, and economic systems and welfare. These elements are not studied separately, but are integrated into learning themes that are relevant to students' lives.

Learning Approaches in Natural and Social Sciences

Natural and Social Sciences learning adopts various learning approaches that have been proven effective in developing student competencies. The scientific approach, which encompasses the stages of observing, questioning, gathering information, reasoning, and communicating, serves as a general framework for the learning process. This approach facilitates students' development of science process

skills as well as critical and analytical thinking skills (Jauhari et al., 2025).

Inquiry-based learning is the main strategy in learning Natural and Social Sciences. In inquiry learning, students are encouraged to ask questions, formulate hypotheses, design investigations, collect and analyze data, and draw conclusions. This process develops not only conceptual understanding but also metacognitive skills and scientific dispositions such as curiosity, openness to new ideas, and intellectual honesty.

Project-based learning and problem-based learning are also important strategies in Natural and Social Sciences. Through authentic projects or problem solving, students can apply knowledge from various domains to produce meaningful solutions or products. This strategy is in line with the principles of contextual learning which emphasize the relevance of learning to students' real lives.

Student Competencies in Natural and Social Sciences Learning

The competencies developed through learning Natural and Social Sciences are multidimensional, covering aspects of knowledge, skills and attitudes. From a knowledge aspect, students are expected to understand fundamental concepts about nature and society and the relationship between the two. This conceptual understanding forms the foundation for the development of scientific and social literacy which is essential for life in modern society.

From a skills perspective, learning Natural and Social Sciences develops critical thinking skills, science process skills, problem-solving skills, communication skills, and collaboration skills. These skills are 21st-century competencies essential for students' future success. Furthermore, learning Natural and Social Sciences also develops digital skills through the use of technology in the learning process.

From an attitudinal perspective, learning Natural and Social Sciences fosters environmental awareness, social responsibility, appreciation for diversity, and other character values. Students are expected to develop a concern for environmental sustainability, respect for cultural differences and perspectives, and actively participate as responsible citizens.

RESEARCH METHODS

This research employed a qualitative approach using literature study and document analysis. Data were collected through a review of various literature sources relevant to Natural and Social Sciences learning, including Independent Curriculum documents, textbooks, scientific journals, and research reports. Data analysis was conducted descriptively and analytically by identifying key themes, patterns, and relationships between concepts in the implementation of Natural and Social Sciences learning in elementary schools. Source triangulation technique is used to validate findings by comparing information from various literature sources.

RESULTS AND DISCUSSION

Characteristics of the Implementation of Natural and Social Sciences Learning

The implementation of Natural and Social Sciences learning in elementary schools shows characteristics that distinguish it from conventional science and social science learning. First, learning is designed with a thematic-integrative approach in which science and social content is organized into themes that are relevant to students' lives. Themes such as self and family, the environment, health, and technology provide

learning contexts that enable students to explore natural and social phenomena simultaneously.

In practice, learning Natural and Social Sciences emphasizes direct experience and concrete learning. Students are invited to observe phenomena in their environment, conduct simple experiments, interview sources, or go on field visits. These hands-on experiences lay the foundation for building deep and meaningful conceptual understanding (Nuai & Nurkamiden, 2022). For example, in studying water, students not only learn about the water cycle as a natural phenomenon, but also explore its use in everyday life, the issue of water scarcity, and human responsibility in maintaining clean water.

Second, natural and social science learning integrates literacy and numeracy development in the context of science and social learning. Students not only learn to read and write in language lessons, but also develop literacy skills through reading informative texts about natural phenomena, writing observation reports, or creating environmental campaign posters. Likewise, numeracy skills are developed through activities such as measuring, collecting and displaying data, or creating simple graphs.

Third, learning emphasizes the development of higher-order thinking skills through productive questions and challenging cognitive tasks. Students are not only required to remember facts, but also to analyze cause-and-effect relationships, compare and contrast phenomena, evaluate solutions to problems, and create new products or ideas. This approach is in line with the demands of 21st century competencies which prioritize critical and creative thinking skills.

Fourth, assessment in Natural and Social Sciences learning uses a varied and authentic approach. In addition to conventional written assessments, educators also use performance assessments such as observations during the learning process, project assessments, portfolios, and presentations. Assessments are designed not only to measure content mastery but also to assess the development of students' process skills, thinking skills, and attitudes.

Challenges in Implementing Natural and Social Sciences Learning

Despite having significant potential, the implementation of Natural and Social Sciences learning faces various challenges. The first challenge relates to the readiness of educators. Many educators who have taught with a separate learning system find it difficult to design learning that coherently integrates science and social content (Dewi Nuranisa Putri & Dwi Anggraeni Siwi, 2025). They need a deep understanding of integrative learning philosophy as well as skills in identifying natural points of integration between the science and social domains.

Educator training and professional development is key to addressing these challenges. Educators need support in the form of workshops, mentoring, and professional learning communities where they can share good practices and learn from each other. In addition, educators also need a better understanding of inquiry pedagogy and learner-centered learning strategies.

The second challenge is the availability of learning resources that support integrative learning. Available textbooks and teaching materials still often organize content separately or do not provide a strong enough context for meaningful integration. In addition, the availability of tools and materials for experiments or active learning activities is still a constraint in many schools, especially in areas with limited resources.

The development of quality learning resources is a priority in supporting the implementation of Natural and Social Sciences. Good learning resources should provide rich context, productive questions, and learning activities that facilitate exploration and construction of knowledge. The use of digital technology can also be a solution in providing access to diverse and interactive learning resources.

The third challenge relates to the assessment system, which still tends to emphasize mastery of factual content. Assessments that only measure the ability to remember and understand are not in accordance with the learning objectives of Natural and Social Sciences which emphasize the development of high-level thinking skills and abilities. A transformation is needed in the assessment system that places more emphasis on authentic and formative assessment that can provide feedback for improving learning.

The fourth challenge is the unequal understanding among educational stakeholders, including parents and the community, of the philosophy and objectives of Natural and Social Sciences learning. There is still a perception that effective learning is one that delivers a lot of factual content, when in fact, Natural and Social Sciences learning places greater emphasis on the learning process and competency development. Effective outreach and communication with various stakeholders are crucial to building support for the implementation of this new curriculum.

Impact on Student Competency Development

The implementation of Natural and Social Sciences learning has the potential to provide a significant positive impact on the development of student competencies. First, an integrative approach helps students develop a more holistic and deeper understanding of life phenomena. Students learn that natural phenomena cannot be separated from their social context, and conversely, social phenomena are influenced by natural environmental conditions (Muntamah et al., 2023). This holistic understanding is important for developing systemic thinking skills that enable students to see the relationships and interdependencies between various elements in a complex system.

Second, the inquiry-based and problem-solving learning emphasized in Natural and Social Sciences develops students' critical and creative thinking skills. Through the process of asking questions, formulating hypotheses, collecting and analyzing data, and drawing conclusions, students develop scientific thinking skills that are useful not only in academic contexts but also in everyday life. They learn not to accept information at face value but to question, seek evidence, and evaluate arguments before drawing conclusions.

Third, Natural and Social Sciences learning, which emphasizes collaborative learning and communication, develops students' social skills. Through group work, discussions, and presentations, students learn to listen to others' perspectives, express ideas clearly, negotiate, and collaborate to achieve shared goals. These skills are crucial in an increasingly connected and interdependent society.

Fourth, learning that emphasizes local context and real-life issues helps students develop awareness and responsibility as citizens. Students learn to identify problems in their environment, understand different perspectives on the problem, and think about possible solutions. This kind of learning develops students' agency, namely the awareness that they have the ability and responsibility to contribute to improving the condition of their environment and society.

Fifth, the integration of literacy and numeracy in natural and social sciences learning strengthens the development of students' fundamental abilities. They learn that literacy and numeracy are not just skills learned in separate subjects, but tools used to understand the world and communicate that understanding. This integration makes literacy and numeracy learning more meaningful and functional.

Optimization Strategy for Natural and Social Sciences Learning

To optimize the implementation of Natural and Social Sciences learning, various systemic and comprehensive strategies are required (Chaliq & Toifur, 2024). First, strengthening the capacity of educators through ongoing training and professional development programs. Training should not only equip educators with knowledge of content and pedagogy, but also provide opportunities to practice and reflect on integrative learning. Assistance and mentoring are also important to support educators in implementing learning in the classroom.

Second, the development and provision of quality and contextual learning resources. Good learning resources not only present information but also facilitate the exploration and construction of knowledge. The development of learning resources needs to involve educators, content experts, and learning designers to ensure that the learning resources produced are appropriate to the needs and context of learning. The use of digital technology also needs to be increased to provide access to diverse and interactive learning resources.

Third, the development of an assessment system that is authentic and supports learning. Assessments need to be designed to measure not only content mastery but also skill and attitude development. Formative assessments that provide quality feedback should be emphasized because they can help students and educators improve the learning process. Furthermore, clear rubrics and assessment criteria should be developed for performance assessments such as projects, presentations, and portfolios.

Fourth, strengthening collaboration between schools, families and communities. Learning science and social sciences, which emphasizes real-life contexts, requires the involvement of various parties outside of school. Parents need to understand the learning philosophy and support their children in the learning process at home. The community can be a learning resource and partner in learning projects. This collaboration will enrich students' learning experiences and strengthen the relevance of learning to real life.

Fifth, ongoing research and evaluation to understand the implementation of Natural and Social Sciences learning in the field. Research can identify good practices that can be disseminated as well as challenges that need to be addressed. Periodic curriculum evaluation is necessary to ensure that the curriculum remains relevant to the needs of students and developments of the times. Research and evaluation results need to be communicated to various stakeholders and used as a basis for improving policies and practices.

CONCLUSION

Learning Natural and Social Sciences in the Independent Curriculum represents a paradigm shift in science and social education in Indonesia towards a more integrative and holistic approach. Learning characteristics that emphasize content integration, inquiry-based learning, contextualization with real life, and the development of

multidimensional competencies are in line with the demands of 21st-century education.

The implementation of Natural and Social Sciences learning faces various challenges, especially related to the readiness of educators, the availability of learning resources, assessment systems, and stakeholder understanding. However, with the right strategies in the form of strengthening educator capacity, developing quality learning resources, transforming assessment systems, strengthening multi-stakeholder collaboration, and ongoing research, these challenges can be overcome.

Learning Natural and Social Sciences has significant potential to develop student competencies, including holistic understanding, critical and creative thinking skills, social and communication skills, civic awareness and responsibility, and literacy and numeracy. These competencies are essential for preparing students to face the increasingly complex and dynamic challenges of life in the future.

Successful implementation of science and social studies learning requires commitment and support from various parties, including policymakers, education administrators, educators, parents, and the community. With collaboration and collective effort, science and social studies learning can be an effective vehicle for developing a generation that is not only intellectually intelligent but also cares about the environment and society, and is able to contribute to national development.

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