Journal of Elementary Education (JELEDUC)
Volume 2(1) 21 – 30, Juni 2025
ISSN: 3063-5330 (Online)
DOI: 10.38040/jeleduc.v2i1.1224
The article is published with Open Access at: https://jurnal.umla.ac.id/index.php/JELEDUC/index

Analysis of natural and social sciences concept understanding of fifth grade students of SDN Bedahan, Lamongan Regency

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ABSTRACT

This study aims to analyze the level of understanding of the concept of natural and social sciences of grade V students at SD Negeri Bedahan. Concept understanding is an important foundation in the development of critical thinking and problem solving skills, especially in learning Natural and Social Sciences (ESS) which contains various natural and social phenomena. This study used a descriptive qualitative approach with data collection techniques through observation, interviews and documentation studies. The research subjects consisted of the fifth grade homeroom teacher and 32 fifth grade students. The results showed that students' understanding of the concept of natural and social sciences was low. The main factors that influence this condition are the dominance of the lecture method which makes students passive, the use of learning media in the form of textbooks and videos, although learning facilities are adequate but the use of interactive learning media is still minimal. In addition, students tend to memorize concepts without understanding the deep meaning, and are embarrassed and afraid to ask questions when experiencing difficulties. This study recommends the need for the use of interactive learning methods and the utilization of digital interactive learning media to increase students' understanding of natural and social sciences concepts.

Keywords: Concept Understanding, Natural and Social Sciences, Interactive Learning, Analysis, Primary School

Received:1 June 2025	*Revised:15 June 2025*	*Accepted:22 June 2025*	*Published:30 June 2025*

Citation (APA Style):

Sa'adah, et al. (2025). Analysis of natural and social sciences concept understanding of fifth grade students of SDN Bedahan, Lamongan Regency. *JELEDUC: Journal of Elementary Education.* 2(1), 21–30. Doi: 10.38040/jeleduc.v2i1.1224

INTRODUCTION

Education has an important role in shaping the intelligence of a nation. Success in educating and building human resources (HR) that are integrated, have positive attitudes, and dignified behavior reflects the high quality of a country's education system. Therefore, it is very important to design and implement an education system that is able to develop students' potential, interests and skills as a whole, especially in facing various educational challenges in the 21st century (Mazidah & Sartika, 2023). This is in line with Article 1 of Law Number 20 of 2003 concerning the National Education System, which states that education is a conscious and systematically designed effort to create a learning environment and learning process, so that students can actively develop their potential, including spiritual aspects, self-control, personality, intelligence, and skills needed for themselves, society, nation and state.

In the primary stage of education, students are introduced to various disciplines that aim to build a better understanding of themselves, their surroundings, and social relationships in society (Putri, 2023). Among various subjects, Natural and Social Sciences subjects have a strategic role in achieving these goals (Ramadhan et al., 2023).

Natural and Social Sciences is a subject designed to provide students with an in-depth understanding of the natural and social phenomena that surround them (Zulkarnain & Nurjanah, 2023). Natural and Social Sciences learning aims to provide meaningful learning experiences and increase the cognitive capacity of students (Mazidah & Sartika, 2023). In the implementation of the Merdeka Curriculum, Natural Science (NS) and Social Science (SS) subjects are combined into one unit in the form of natural and social sciences. The purpose of this merger is to foster students' interest, curiosity, active involvement, and develop applicable knowledge and skills (Agustina et al., 2022).

Natural and Social Sciences learning is expected to provide experience to students in developing critical thinking skills through various concepts taught. With this ability, students are expected to be able to explain natural phenomena that they encounter in everyday life. In addition, this learning aims to form positive scientific habits and attitudes, so that students can better understand and develop the concepts they have learned (L. Lestari et al., 2024). This shows that concept understanding in natural and social sciences is very important because it is the foundation for students to hone their critical thinking skills (Dewi & Ibrahim, 2019).

Concept understanding is like the foundation of a building. Without a strong foundation, the building cannot stand upright and will easily collapse. The same goes for HOTS (Higher Order Thinking Skills) without a deep understanding of concepts, one's critical, creative and analytical thinking skills will be weak and easily influenced by inaccurate information (Hussein, 2022). The ability to understand concepts deeply needs to be built by students since they are in elementary school. With a strong foundation of understanding, students can grow into someone who can solve problems creatively and think critically amidst the challenges and opportunities that exist in today's era (H. Lestari et al., 2024).

Understanding is a basic level in the aspect of the thinking process related to the ability to master or understand something (Rosyadi, 2018). Comprehension is the ability to grasp the meaning or significance of something (Nasyiatur Raafiatul Aziizah, 2019). Meanwhile, a concept can be defined as an abstract idea that makes it possible to categorize objects into examples and non-examples (Rosyadi, 2018). Concepts can be understood as a part of knowledge that is formed through various characteristics. Concepts also serve as representations of the characteristics of

things, which help facilitate communication between people and allow people to think in a more structured way (Nasyiatur Raafiatul Aziizah, 2019).

Concept understanding is a person's ability to understand and accept an idea (Pratiwi et al., 2022). The purpose of concept understanding is to enable students to retell the information or material they have received using their own language, according to their existing knowledge (Meilawati, 2020).

According to Anderson and Krathwohl, there are seven indicators of concept understanding, including (Sasmita & Hartoyo, 2020):

a. Interpreting, where students can convert information from one form to another.
b. Exemplify, in which students can provide examples of a general concept or principle by using similar characteristics to mention examples of a concept.
c. Classifying, in which students can recognize something that falls into a certain category by the process of detecting characteristics or patterns that match certain examples, concepts, or principles.
d. Summarizing, where students can convey one sentence that can represent the information obtained.
e. Drawing conclusions, where students can involve the process of finding patterns through various examples.
f. Comparing, where students can identify similarities and differences between two or more objects.
g. Explaining, where students can apply cause-and-effect models in a system.

However, the literature review states that the understanding of the concept of elementary school natural and social sciences is low. This is evidenced by the results of data from the Organization for Economic Co-operation and Development (OECD) which states that the Program for International Science Assessment (PISA) in 2018 published in 2019, Indonesia ranked 74 out of 79 countries with a score of 371 (OECD, 2019). This shows that the average student in Indonesia still faces difficulties in applying complex and abstract concepts, and shows that students' higher order thinking skills still need to be improved.

Based on research conducted by Erina Susanti et al., 2021 with the title “Analysis of the Level of Understanding of Science Concepts of Grade V Students at SDN Gugus V Cakranegara Subdistrict” shows that the understanding of science concepts in grade V students at SDN Gugus V Cakranegara Subdistrict is low, with an average score of 63, which is far below the Minimum Completeness Criteria (KKM) of 76. This is due to several factors, including the lack of reading habits among students, the dominance of the lecture method applied by teachers and limited learning resources and low student interest in science lessons.

The results of research conducted by (Sa’adah et al., 2025) with the title “Analysis of Students' Concept Understanding Level in Science Learning” shows that students' concept understanding in science subjects is still relatively low. The average score obtained by students only reached 46.67 with 43.33% of them in the low category. This low understanding is especially evident in the indicators of interpreting, inferring, comparing, and explaining. Some of the factors that cause this include low student interest and motivation in learning, the dominance of teaching methods that still rely on teachers, and the lack of innovation in the use of learning media at UPT SMP Negeri 14 Gresik.

Based on the description above, it is necessary to conduct further research on students' concept understanding. The purpose of this study was to analyze the understanding of the concept of natural and social sciences of fifth grade students of SDN Bedahan, Lamongan Regency.

METHODS

In this study using descriptive qualitative research. Qualitative research methods are research methods based on the philosophy of postpositivism, used to research on natural object conditions, where researchers are key instruments, data collection techniques are triangulated (combined), data analysis is inductive / qualitative, and qualitative research results emphasize meaning rather than generalization (Sugiyono, 2024). This research was conducted in November 2024 at SD Negeri Bedahan with the subjects of this research were 1 grade V homeroom teacher and grade V students totaling 32 students. The objects or informants in this study were grade V students and grade V homeroom teachers.

The data collection techniques used in this research are observation, interview, and documentation study. Data collection techniques through observation are applied when research is concerned with human behavior, work processes, or natural symptoms and this technique is suitable for use when the number of respondents observed is not too large (Sugiyono, 2024). Interview is a data collection technique that is often used when conducting preliminary studies to identify problems that need to be researched, this technique is also useful for research that wants to explore more in-depth information from respondents, especially when the number of respondents involved is relatively small (Sugiyono, 2024). Documentation studies involve collecting data from written sources such as books, journal articles, research reports, official documents and archives. In addition, in the process of collecting data, researchers also need to consider ethical aspects, especially related to the privacy and confidentiality of research subjects (Pugu et al., 2024).

Data were collected through observation guidelines, teacher and student interview guidelines, and documentation study guidelines. Observation guidelines aim to collect information by looking at teacher and student activities during the learning process. Interview guidelines were used to guide and limit during the question and answer process. Documentation study guidelines are used to collect data and information related to a comprehensive picture of the current learning conditions. Data analysis techniques used are data reduction, data presentation, drawing conclusions and verification. For data validity in research using triangulation techniques.

RESULTS

Based on the results of a documentation study of student grades in class V natural and social sciences subjects at SDN Bedahan, Lamongan Regency, it is known that 70% of 32 students scored below the Minimum Completion Criteria (KKM) set by the school of 75. This shows that the majority of students are still unable to achieve the expected standards in the learning process. In addition, students only understand some of the concepts, but still have difficulty in applying and deeply understanding the material.

From the observations that have been made, it is found that there are several factors that influence the low understanding of the natural and social sciences concept. Although the learning process has been carried out well, there are a number of obstacles that affect the low understanding of the natural and social sciences concept, including the teacher still dominantly using the lecture method which tends to convey material verbally without involving much discussion and lack of use of interactive learning media and still giving directions to memorize natural and social sciences concepts which causes abstract concepts for students to be easily forgotten after learning.

Learning support facilities are available such as chromebooks, LCD projectors, and adequate internet access. However, their utilization is not optimal in supporting an active learning process. Some teachers only use learning media in the form of videos and materials from textbooks. As a result, many students are passive in class, have difficulty in understanding concepts and obstacles in comparing food chains and food webs and students tend to memorize without really understanding the concept of natural and social sciences.

An interview with the homeroom teacher of SD Negeri Bedahan revealed that the learning media used were still textbooks and videos, and the method used was more dominant lecture method. Teachers realize that the use of learning media and methods used encourages students to memorize more without understanding the concepts deeply. The lack of variety in learning media also has an impact on the lack of active interaction in the classroom, because students are less motivated to ask questions or participate in discussions.

The results of interviews with fifth grade students of SDN Bedahan showed that most of them found it difficult to understand the concepts taught. They said that the delivery of learning materials was less interesting and monotonous as well as the lack of concrete illustrations and examples. Some students also felt shy or afraid to ask questions when experiencing difficulties.

From the documentation study conducted at SD Negeri Bedahan, it was found that the curriculum used has been adjusted to the national education standards with learning objectives that aim to develop students' basic competencies. The expected learning outcomes include concept understanding, critical thinking skills, and application of knowledge in daily life. However, the achievement of learning objectives still experiences obstacles, namely students' difficulties in understanding concepts and applying them in everyday life. So that it has an impact on students' understanding of the natural and social sciences concept and causes students' academic achievement in natural and social sciences subjects to not reach the standard learning outcomes set.

DISCUSSION

Education is the main foundation in building a generation that is smart, characterized, and able to face future challenges. Among the various subjects taught in primary schools, Natural and Social Sciences has an important role in fostering curiosity, understanding of the environment, and the ability to think critically and logically in students (Anggita et al., 2023). However, in its implementation, natural and social sciences learning still faces various challenges, one of which is the low understanding of student concepts.

Based on the results of observations, interviews, and documentation studies conducted at SD Negeri Bedahan, it was found that the understanding of the concept of natural and social sciences of grade V students was low. This can be seen from the results of students' daily test scores in the natural and social sciences subject which show an average of 70% of 32 students, namely 22 students scored below the Minimum Completion Criteria (KKM), and 10 students got scores that met the Minimum Completion Criteria (KKM) set by the school, namely 75, based on student characteristics, subject characteristics, and conditions of the education unit. Factors that influence the low understanding of natural and social sciences concepts are the dominance of the use of the lecture method and the lack of utilization of interactive learning media in the learning process as well as the tendency of students to memorize rather than understand concepts deeply.

The low understanding of natural and social sciences concepts cannot be separated from the learning approach used. The results of interviews with teachers and students show that the

dominant learning method used is lecture. Lecture-based learning methods tend to make students passive and have difficulty in building understanding of abstract concepts (Suparman et al., 2021). Teachers more often provide information in a one-way manner without actively involving students in the learning process.

Interview results with students stated that they are rarely involved in discussions or explorative activities. As a result, students tend to only receive information and memorize it, without really understanding the meaning of the concepts learned. Students also feel shy and afraid to ask questions when they encounter difficulties. The lack of interaction in the classroom can also hinder the development of students' critical thinking, so students have the potential to only become passive recipients of information (Hasanah et al., 2022). This fact reflects that the majority of students have not mastered the concepts of natural and social sciences deeply and thoroughly. This problem cannot be separated from the methods, learning media, and interactions in the learning process.

According to the theory of constructivism developed by Piaget, a meaningful learning process occurs when students actively construct their own knowledge through direct experience and social interaction (Budyastuti & Fauziati, 2021). The main function of constructivism theory is to support the creation of an effective learning process, this theory can improve the interaction between teachers and students, by paying special attention to the stages of teaching (Suryani & Hasanah, 2023). However, in this study, the learning approach is still teacher-centered. Interactive digital media is available but not optimally utilized to support an interactive and experiential learning process.

The lecture method that is often used in natural and social sciences learning tends to make students passive and less actively involved in the learning process. As a result, students' concept understanding is low. Although the lecture method has a significant influence on student learning outcomes, its effectiveness can be increased if combined with question and answer or other methods that make students more active and increase student interest in learning (Handayani, 2023). The Problem Based Learning (PBL) learning model can also encourage students to think critically and collaborate in solving problems, which can basically improve the understanding of the concept of natural and social sciences (Hidayat et al., 2023). The application of PBL allows students to understand the natural and social sciences material with everyday life.

The application of PBL model with the support of interactive digital media can have a positive impact on improving student learning outcomes. Students who participated in problem-based learning with the help of digital media showed significant improvement in concept understanding and higher order thinking skills (Laeli & Kasmui, 2024). This suggests that the integration of the right learning model and appropriate media is essential to improve the quality of natural and social sciences learning in primary schools.

In today's digital era, interactive digital learning media should be an important tool to support an interesting and meaningful learning process. However, the results of observations and interviews show that interactive digital learning media have not been optimally utilized. The use of learning media that is dominantly textbook-based tends to cause monotonous learning, lack of flexibility, and does not provide room for creativity for students (Fitriani et al., 2020). In contrast, digital media such as interactive learning applications, videos, and digital simulations can help simplify abstract concepts and provide a fun learning experience.

Interactive digital learning media can be used as a supporting tool to improve students' understanding of natural and social sciences concepts (Prasetyo & Ramdani, 2021). Learning media plays an important role as a tool in education, which is designed to stimulate students' thoughts, feelings, attention, and abilities or skills. Thus, learning media can encourage and improve a more effective learning process (Junaidi, 2019). The use of learning media can attract students' attention, motivate students to learn, and make the subject matter easier to understand (Felia, 2019).

The utilization of Smart Apps Creator in natural and social sciences learning provides flexibility for teachers in designing learning materials that are more varied and adaptive to student needs. The app supports the integration of various media formats such as text, images, audio, video, and animation that enable the presentation of materials in a more interesting and easy-to-understand manner. In addition, interactive features such as quizzes and live simulations in the application can increase students' active participation in the learning process. Thus, learning becomes not only informative but also explorative and applicative, in accordance with the spirit of the independent curriculum which emphasizes differentiated and student-centered learning.

This condition is very important considering the characteristics of elementary school students who are still at the concrete operational stage according to Piaget, where they more easily understand concepts if accompanied by direct experience and real visualization. Therefore, natural and social sciences learning delivered through interactive applications such as Smart Apps Creator can provide learning experiences that are more in line with the stages of students' cognitive development. It also allows students to build their own understanding through independent exploration, reinforcing the principles of constructivism theory in the learning process.

Not only does it have a positive impact on concept understanding, the application of interactive digital media in learning also contributes to improving students' digital literacy. In the era of digitalization of education, mastery of digital skills is one of the important indicators in readiness to face the challenges of the 21st century. Students who are accustomed to using digital-based learning applications will be more adaptive to technological developments and able to use them as a means of lifelong learning. Thus, the learning process is not only limited to the classroom, but also extends to the out-of-school environment through the use of technology.

Besides students, teachers also benefit from the application of digital application-based learning media. Smart Apps Creator, for example, allows teachers to manage learning materials independently without dependence on complex software. Teachers can design their own materials according to class characteristics, modify content based on needs, and evaluate student learning achievements through features available in the application. This encourages teachers to be more creative, reflective and innovative in the learning process.

The integration between the PBL model and interactive digital media also supports the principle of differentiated learning, where teachers can adjust the content and the way the material is delivered according to students' ability levels, interests and learning styles. In a heterogeneous classroom context, differentiated learning is essential to ensure that all students have equal opportunities in understanding the material and achieving the learning objectives. The use of Smart Apps Creator makes it easier for teachers to provide various forms of content, ranging from visual to kinesthetic, according to students' characteristics.

Practically, the integration of PBL model and interactive digital media can improve the quality of interaction in the classroom. Students will be more interested in actively participating because learning is designed based on problems that are close to their lives. Through the process of problem

exploration, group discussion, and solution presentation, students not only learn natural and social sciences materials but also develop communication, collaboration, and responsibility skills. This process is very much in line with the transformative learning approach that places students as active agents in the construction of knowledge.

Seeing the various problems that exist, it is necessary to make innovations in the natural and social sciences learning process, especially in terms of the methods and media used. One solution that can be offered is to develop interactive digital learning media based on Smart Apps Creator. The use of this application allows students to interact directly with the material, explore natural and social sciences concepts through simulations, and engage in contextualized problem-solving activities.

CONCLUSION

The low understanding of the concept of natural and social sciences among fifth grade students at SD Negeri Bedahan is caused by several factors. One of them is the dominance of the lecture method which leads to teacher-centered learning that makes students passive, only memorizing material without understanding the concept deeply. Some students are also shy or afraid to ask questions when experiencing difficulties. In addition to the method, the use of learning media is also not optimal. Currently, the existing interactive digital media has not been optimally utilized to support meaningful learning. Some teachers tend to rely on textbooks or videos as learning resources. As a result, the learning process becomes monotonous and less connected to the context of students' daily lives and students' difficulties in understanding abstract concepts in natural and social sciences subjects. Based on this, it is necessary to develop a digital learning media based on Smart Apps Creator to improve the understanding of the concept of natural and social sciences for grade V elementary school students.

ACKNOWLEDGMENTS

The author expresses praise and gratitude to the presence of Allah SWT for His abundance of grace, grace, and inayah so that the author can complete the preparation of this journal well and smoothly. The author realizes that the preparation of this journal would not have been possible without the support, assistance, and prayers of various parties who have contributed greatly, both directly and indirectly. Therefore, with all humility, the author would like to express her deepest gratitude to the Principal of SD Negeri Bedahan who has given permission and opportunity to the author to conduct research at the school. The support given was very helpful in the smoothness of the research process, especially in collecting data in the field.

My gratitude also goes to the fifth grade homeroom teacher of SD Negeri Bedahan who has accompanied and assisted the author during the implementation of the research in the classroom, as well as providing various useful information and inputs. The author also expresses her sincere gratitude to all fifth grade students who have been willing to be respondents and actively participate in the data collection process. The enthusiasm and honesty of the students were very helpful in obtaining valid data relevant to the research focus.

Finally, the author would like to thank all parties who cannot be mentioned one by one, who have helped and contributed in the preparation of this journal. Hopefully, all forms of assistance and support provided will be rewarded by Allah SWT. The author hopes that the results of this study can provide real benefits and contributions to the world of education, especially in improving the quality of natural and social sciences learning at the elementary school level. Constructive

criticism and suggestions are expected for the improvement and refinement of this scientific work in the future.

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